

## ภาคผนวก

- ภาคผนวกที่ 1 ผลการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม
- ภาคผนวกที่ 2 หนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
และใบอนุญาตเป็นผู้ให้บริการตรวจวัดและวิเคราะห์ระดับความเข้มข้น  
ของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษา  
สารเคมีอันตราย ระดับความร้อน แสงสว่าง และเสียง  
จากกรมสวัสดิการและคุ้มครองแรงงาน
- ภาคผนวกที่ 3 เอกสารการสอบเทียบอุปกรณ์เครื่องมือตรวจวัดคุณภาพสิ่งแวดล้อม
- ภาคผนวกที่ 4 เอกสาร Detection Limit ของรายการทดสอบ
- ภาคผนวกที่ 5 ผลการพิจารณารายงานการประเมินผลกระทบสิ่งแวดล้อม  
และผลการพิจารณารายงานการเปลี่ยนแปลงรายละเอียดโครงการ  
และมาตรการด้านสิ่งแวดล้อม โครงการโรงไฟฟ้าพลังความร้อนร่วมราชพัฒนา  
(ส่วนขยาย ระยะที่ 4) (ครั้งที่ 2)
- ภาคผนวกที่ 6 หนังสือตอบรับการส่งรายงานการปฏิบัติตามมาตรการป้องกัน  
และแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบ  
ผลกระทบสิ่งแวดล้อม ประจำปีเดือนมกราคม-มิถุนายน 2568
- ภาคผนวกที่ 7 ช่องทาง ขั้นตอนรับเรื่องร้องเรียน
- ภาคผนวกที่ 8 สรุปรูปการสอบเทียบเครื่องตรวจวัดคุณภาพอากาศอย่างต่อเนื่อง (CEMs)
- ภาคผนวกที่ 9 สรุปรูปผลการตรวจวัดคุณภาพอากาศด้วยระบบ CEMs  
ประจำปีเดือนกรกฎาคม-ธันวาคม 2568 และบันทึกสภาวะต่างๆ  
ในการเดินเครื่องขณะทำการเก็บตัวอย่างด้วยวิธี Stack Sampling
- ภาคผนวกที่ 10 วิธีการปฏิบัติงาน เรื่อง การดำเนินการเมื่อมลภาวะจากปล่องเกินค่าที่กฎหมายกำหนด
- ภาคผนวกที่ 11 บุคลากรด้านสิ่งแวดล้อมประจำโรงงาน
- ภาคผนวกที่ 12 แผนตรวจสอบและบำรุงรักษาเชิงป้องกัน (Preventive Maintenance Program)  
ประจำปี 2568
- ภาคผนวกที่ 13 Noise Contour
- ภาคผนวกที่ 14 ปริมาณและการจัดการกากของเสียอุตสาหกรรม
- ภาคผนวกที่ 15 สรุปรูปปริมาณส่งขยะมูลฝอย ประจำปีเดือนกรกฎาคม-ธันวาคม 2568  
และใบอนุญาตเก็บขนสิ่งปฏิกูลและมูลฝอย
- ภาคผนวกที่ 16 นโยบายสิ่งแวดล้อม ความปลอดภัยและอนุรักษ์พลังงาน
- ภาคผนวกที่ 17 การอบรมด้านอาชีวอนามัยและความปลอดภัย / กิจกรรมส่งเสริมความปลอดภัย
- ภาคผนวกที่ 18 เอกสารการแต่งตั้งคณะกรรมการความปลอดภัย อาชีวอนามัย  
และสภาพแวดล้อมในการทำงาน

## ภาคผนวก (ต่อ)

- ภาคผนวกที่ 19 เอกสารการขออนุญาตเข้าทำงานในพื้นที่โครงการ
- ภาคผนวกที่ 20 แผนฉุกเฉิน และรูปประกอบการซ้อมดับเพลิง ประจำเดือนกรกฎาคม-ธันวาคม 2568 และรูปประกอบการซ้อมแผนฉุกเฉิน ครั้งที่ 2/2568
- ภาคผนวกที่ 21 เอกสารการแต่งตั้งเจ้าหน้าที่ปฐมพยาบาล
- ภาคผนวกที่ 22 แผนปฏิบัติการและบำรุงรักษาอุปกรณ์สถานีควบคุมและวัดปริมาตรก๊าซ
- ภาคผนวกที่ 23 ทะเบียนวิศวกรควบคุมและอำนวยความสะดวกให้หม้อน้ำ และผู้ควบคุมหม้อน้ำ
- ภาคผนวกที่ 24 เอกสารการตรวจสอบหม้อน้ำ ประจำปี 2568 และเอกสารตรวจสอบลักษณะสมบัติของน้ำก่อนป้อนเข้าสู่หม้อน้ำ
- ภาคผนวกที่ 25 แผนมวลชนสัมพันธ์ ประจำปี 2568
- ภาคผนวกที่ 26 สรุปผลการสำรวจสภาพเศรษฐกิจ-สังคม ประจำปี 2568
- ภาคผนวกที่ 27 ประกาศแต่งตั้งและเอกสารการประชุมคณะกรรมการติดตามตรวจสอบการดำเนินงานโครงการ
- ภาคผนวกที่ 28 เอกสารรับรองการตรวจสอบสุขภาพ
- ภาคผนวกที่ 29 ข้อมูลอัตราการเจ็บป่วยจากสถานบริการสาธารณสุข ประจำปี 2568



ภาคผนวกที่ 1

ผลการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม



Report No. : 2025-500005604 / 001-1 (Page 1 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Srracha District, Chonburi 20230  
Tel.: 038-481-555

### Analysis Report

Sample Type : Emission Air  
Sampling Location : HRS#4 Stack  
Ratch Pathana Energy Public Company Limited, Chonburi province  
Sampling By : Mingman Sirichoti (P-197-A-0026)  
Nathaphon Taprab (P-197-A-0012)  
Laboratory Name : SGS (Thailand) Limited (P-197)

Sampling Date : October 8, 2025  
Sampling Time : 14:15-15:03 hrs (TSP), 14:46-15:15 hrs. (CEMs)  
Received Date : October 9, 2025  
Analysis Date : October 16-20, 2025

Parameter	Unit	Value	Emission Standard <sup>iv</sup>	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm	320	-	-
Stack Temperature	°C	153.2	-	-
Dry Gas Temperature	°C	32.6	-	-
Absolute Stack Pressure	mm.Hg	757.6	-	-
Air Velocity	m/s	18.83	-	-
O <sub>2</sub>	%	15.09	-	-
CO <sub>2</sub>	%	3.15	-	-
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr, dry	345,001	-	-
Moisture	%	9.17	-	-
TSP	mg/Nm <sup>3</sup>	1.18	-	-
	mg/Nm <sup>3</sup>	2.83	54 <sup>iv</sup>	-
	Emission Rate	0.114	2,592 <sup>iv</sup>	-
SO <sub>2</sub>	ppm	N.D. (<0.018)	-	-
	ppm	N.D. (<0.043)	18 <sup>iv</sup>	-
	Emission Rate	N.D. (<0.005)	5,445 <sup>iv</sup>	-
NO <sub>x</sub> (as NO <sub>2</sub> )	ppm	34.50	-	-
	ppm	82.49	108 <sup>iv</sup>	-
	Emission Rate	6,220	23,480 <sup>iv</sup>	-
CO	ppm	43.49	-	-
	ppm	103.99	690 <sup>iv</sup>	-
	Emission Rate	4,773	-	-

Remark : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
N.D. = Not Detected  
Sources : <sup>i</sup> EIA emission standard  
<sup>ii</sup> Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
<sup>iii</sup> Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by Approved by   
(Phatsakorn Soonthornwiphat) (Thipsan Yommana)  
Technical Specialist Section Head Technical Specialist Manager  
License ID: P-197-P-0004 License ID: P-197-P-0005



TYMS/WIWI

LABORATORY ADDRESS: 1/209, and 1/211 Moo1, Soi Sukhumvit 2, Ban Chiang, Bangkok, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed overleaf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute part of a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.  
SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajanagarindra Road, Chong Nonsi, Yannawa, Bangkok 10120 t +66 002 678 18 13 www.sgs.co.th

IE 025024

Member of the SGS Group



Report No. : 2025-500005604 / 001-1 (Page 2 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Srracha District, Chonburi 20230  
Tel.: 038-481-555

### Analysis Report

Sample Type : Emission Air  
Sampling Location : HRS#4 Stack  
Ratch Pathana Energy Public Company Limited, Chonburi province  
Sampling By : Mingman Sirichoti, Nathaphon Taprab  
Laboratory Name : SGS (Thailand) Limited

Sampling Date : October 8, 2025  
Sampling Time : 11:35-12:23 hrs.  
Received Date : October 9, 2025  
Analysis Date : October 16-20, 2025

Parameter	Unit	Value	Emission Standard <sup>iv</sup>	Analytical Methods
Sampling Time	hr.	11:35-12:23	-	-
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	320	-	-
Stack Temperature	°C	153.0	-	-
Dry Gas Temperature	°C	32.6	-	-
Absolute Stack Pressure	mm.Hg	757.6	-	-
Air Velocity	m/s	18.79	-	-
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr	343,446	-	-
Moisture	%	9.44	-	-
O <sub>2</sub>	%	15.09	-	-
CO <sub>2</sub>	%	3.15	-	-
PM-10	mg/Nm <sup>3</sup>	0.33	-	-
	mg/Nm <sup>3</sup>	0.79	-	-
	Emission Rate	0.031	-	-
PM 2.5	mg/Nm <sup>3</sup>	0.19	-	-
	mg/Nm <sup>3</sup>	0.46	-	-
	Emission Rate	0.018	-	-

Remark : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
EIA emission standard  
Sources : <sup>i</sup> Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
<sup>ii</sup> Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by Approved by   
(Phatsakorn Soonthornwiphat) (Thipsan Yommana)  
Technical Specialist Section Head Technical Specialist Manager



TYMS/WIWI

LABORATORY ADDRESS: 1/209, and 1/211 Moo1, Soi Sukhumvit 2, Ban Chiang, Bangkok, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed overleaf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute part of a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.  
SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajanagarindra Road, Chong Nonsi, Yannawa, Bangkok 10120 t +66 002 678 18 13 www.sgs.co.th

IE 025025

Member of the SGS Group



Report No. : 2025-500005604 / 001-1 (Page 3 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Srracha District, Chonburi 20230  
Tel.: 038-481-555

### Analysis Report

Sample Type : Emission Air Quality  
Measurement Location : HRSG# 4 Stack  
Measurement Date : October 8, 2025  
Measurement Time : 14:46-15:15 hrs.  
Measurement By : Mingman Sirichoti (2-197-4-0026), Natthaphon Taprab (2-197-4-0012)

Date (dd/mm/yy)	SO <sub>2</sub> ppm	NO <sub>x</sub> ppm	CO ppm	CO <sub>2</sub> % Vol	O <sub>2</sub> % Vol	SO <sub>2</sub> at 7%O <sub>2</sub> ppm	NO <sub>x</sub> at 7%O <sub>2</sub> ppm	CO at 7%O <sub>2</sub> ppm
08/10/2025	0.00	34.95	42.03	3.18	15.07			
09/10/2025	0.00	35.08	41.64	3.18	15.06			
10/10/2025	0.00	35.18	41.66	3.19	15.05			
09/10/2025	0.00	35.10	41.65	3.19	15.05			
09/10/2025	0.00	34.98	41.40	3.19	15.04			
08/10/2025	0.00	34.87	41.21	3.20	15.02			
09/10/2025	0.00	34.99	40.47	3.21	14.99			
08/10/2025	0.00	35.07	40.63	3.23	14.97			
09/10/2025	0.00	34.61	41.04	3.24	14.97			
08/10/2025	0.00	34.53	40.79	3.23	14.97			
09/10/2025	0.00	34.53	41.69	3.24	15.00			
08/10/2025	0.00	34.58	41.73	3.24	15.01			
09/10/2025	0.00	34.71	41.49	3.21	15.02			
08/10/2025	0.00	34.53	41.89	3.19	15.06			
09/10/2025	0.00	34.72	41.86	3.19	15.06			
08/10/2025	0.00	34.87	42.60	3.15	15.10			
09/10/2025	0.00	34.83	43.13	3.12	15.11			
08/10/2025	0.00	34.83	43.29	3.13	15.13			
09/10/2025	0.00	34.85	43.69	3.10	15.15			
08/10/2025	0.00	34.54	44.96	3.07	15.15			
09/10/2025	0.00	34.30	45.43	3.06	15.16			
08/10/2025	0.00	34.16	45.47	3.08	15.16			
09/10/2025	0.00	34.13	46.12	3.09	15.17			
08/10/2025	0.00	33.85	46.86	3.09	15.18			
09/10/2025	0.00	33.75	47.35	3.06	15.18			
08/10/2025	0.00	33.66	47.11	3.07	15.17			
09/10/2025	0.00	33.53	47.30	3.07	15.17			
08/10/2025	0.00	33.44	47.65	3.09	15.17			
09/10/2025	0.00	33.62	46.78	3.09	15.14			
08/10/2025	0.00	34.03	44.66	3.11	15.13			
Minimum	0.00	33.44	40.47	3.06	14.97		79.96	96.76
Maximum	0.00	35.18	47.73	3.24	15.18		84.11	114.13
Average	0.00	34.50	43.49	3.15	15.09		82.49	103.99
						18 <sup>u</sup> , 20 <sup>v</sup>	108 <sup>u</sup> , 120 <sup>v</sup>	690 <sup>u</sup>

Remarks : - Analytical Method for SO<sub>2</sub> is followed US EPA Method 6C. NO<sub>x</sub> is followed US EPA Method 7E. CO is followed US EPA Method 10  
- Analytical Method for O<sub>2</sub> and CO<sub>2</sub> is followed US EPA Method 3A  
Sources : 1) EIA emission standard.  
2) Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
3) Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by Approved by   
(Phatsakorn Soonthornwiphat) (Thapsan Yommana)  
Technical Specialist Section Head Technical Specialist Manager  
License ID: 2-197-4-0004 License ID: 2-197-4-0005



TYMS/WIWI

This document is issued by the Company under its General Conditions of Service printed hereon. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.  
SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajinagarindra Road, Chong Nonsi, Yomawa, Bangkok 10120 t +66 (0)2 678 18 13 www.sgs.co.th

IE 025026

Member of the SGS Group



Report No. : 2025-500005604 / 001-2 (Page 1 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Srracha District, Chonburi 20230  
Tel.: 038-481-555

### Analysis Report

Sample Type : Emission Air Quality  
Sampling Location : HRSG# 5 Stack  
Sampling Date : October 3, 2025  
Sampling Time : 13:15-14:03 hrs. (TSP), 13:21-13:50 hrs. (CEMs)  
Sampling By : Mingman Sirichoti (2-197-4-0026)  
Received Date : October 6, 2025  
Analysis Date : October 16-21, 2025  
Laboratory Name : SGS (Thailand) Limited (2-197)

Parameter	Unit	Value	Emission Standard <sup>u</sup>	Emission Standard <sup>u</sup> and 3)	Analytical Methods
Fuel Type	-	Natural Gas	-	-	-
Stack Diameter	cm	225	-	-	-
Stack Temperature	°C	136.5	-	-	-
Dry Gas Temperature	°C	34.0	-	-	-
Absolute Stack Pressure	mm.Hg	758.7	-	-	-
Air Velocity	m/s	20.01	-	-	-
O <sub>2</sub>	%	15.93	-	-	U.S. EPA Method 2
CO <sub>2</sub>	%	2.83	-	-	U.S. EPA Method 3A
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr, dry	189,816	-	-	U.S. EPA Method 2
Moisture	%	8.71	-	-	U.S. EPA Method 4
TSP	mg/Nm <sup>3</sup>	0.84	-	60 <sup>u</sup>	U.S. EPA Method 5
	Emission Rate	2.35	45 <sup>u</sup>	1,173 <sup>u</sup>	By Calculation
SO <sub>2</sub>	g/s	0.66	-	-	U.S. EPA Method 6C
	at actual O <sub>2</sub>	1.83	15 <sup>u</sup>	20 <sup>u</sup>	By Calculation
	Emission Rate	0.090	1,024 <sup>u</sup>	-	By Calculation
NO <sub>x</sub> (as NO <sub>2</sub> )	ppm	5.42	-	-	U.S. EPA Method 7E
	at actual O <sub>2</sub>	15.16	90 <sup>u</sup>	120 <sup>u</sup>	By Calculation
	Emission Rate	0.538	4,415 <sup>u</sup>	-	By Calculation
CO	ppm	0.24	-	690 <sup>u</sup>	U.S. EPA Method 10
	at actual O <sub>2</sub>	0.67	-	-	By Calculation
	Emission Rate	0.014	-	-	By Calculation

Remark : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
Sources : 1) EIA emission standard.  
2) Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
3) Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by Approved by   
(Phatsakorn Soonthornwiphat) (Thapsan Yommana)  
Technical Specialist Section Head Technical Specialist Manager  
License ID: 2-197-4-0004 License ID: 2-197-4-0005



TYMS/WIWI

LABORATORY ADDRESS: 1/209, and 1/211 Moo 1, So Sukhumvit 2, Ban Chiang, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed hereon. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.  
SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajinagarindra Road, Chong Nonsi, Yomawa, Bangkok 10120 t +66 (0)2 678 18 13 www.sgs.co.th

IE 025027

Member of the SGS Group





Report No. : 2025-500005604 / 001-2 (Page 2 of 3)  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Siriracha District, Chonburi 20230  
Tel.: 038-481-555

Report No. : 2025-500005604 / 001-2 (Page 3 of 3)  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Siriracha District, Chonburi 20230  
Tel.: 038-481-555

Issued date: October 30, 2025

## Analysis Report

Sample Type : Emission Air Quality  
Sampling Location : HRSG# 5 Stack  
Sampling Time : 14:10-15:58 hrs.  
Received Date : October 6, 2025  
Laboratory Name : SGS (Thailand) Limited

## Analysis Report

Sample Type : Emission Air Quality  
Measurement Location : HRSG# 5 Stack  
Measurement Date : October 3, 2025  
Measurement Time : 13:21-13:50 hrs.  
Measurement By : Mingman Sirichoti, Nawat Chalioed (2-197-4-0009)

Parameter	Unit	Value	Emission Standard <sup>u</sup>	Analytical Methods
Sampling Time	hr.	14:10-15:58	-	-
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	225	-	-
Stack Temperature	°C	134.0	-	-
Dry Gas Temperature	°C	34.8	-	-
Absolute Stack Pressure	mm.Hg	758.7	-	-
Air Velocity	m/s	20.00	-	U.S.EPA Method 2
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr	191,220	-	U.S.EPA Method 2
Moisture	%	8.57	-	U.S.EPA Method 4
O <sub>2</sub>	%	15.93	-	U.S.EPA Method 3A
CO <sub>2</sub>	%	2.83	-	U.S.EPA Method 3A
at actual O <sub>2</sub>	mg/Nm <sup>3</sup>	0.36	-	U.S.EPA Method 201A
PM-10	mg/Nm <sup>3</sup>	0.99	-	By Calculation
Emission Rate	g/s	0.019	-	U.S.EPA Method 201A
at actual O <sub>2</sub>	mg/Nm <sup>3</sup>	0.26	-	By Calculation
PM 2.5	mg/Nm <sup>3</sup>	0.73	-	By Calculation
Emission Rate	g/s	0.014	-	By Calculation

Remark : N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
Sources :  
1. Emission standard  
2. Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
3. Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by (Phatsakorn Soonthornwiphat)  
Technical Specialist Section Head  
Approved by (Thapsan Yommana)  
Technical Specialist Manager

TYMS/WIWI



LABORATORY ADDRESS: 1209, and 1211 Moo1, Soi Sukhumvit 2, Banachang, Banachang, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed overleaf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its inspection only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute part of a transaction from which the Client's rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

IE 025028

SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajinagarindra Road, Chong Nonsi, Yananawa, Bangkok 10120 t +66 (0)2 878 18 13 www.sgs.co.th

Member of the SGS Group



Report No. : 2025-500005604 / 001-2 (Page 3 of 3)  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Siriracha District, Chonburi 20230  
Tel.: 038-481-555

Issued date: October 30, 2025

## Analysis Report

Sample Type : Emission Air Quality  
Measurement Location : HRSG# 5 Stack  
Measurement Date : October 3, 2025  
Measurement Time : 13:21-13:50 hrs.  
Measurement By : Mingman Sirichoti, Nawat Chalioed (2-197-4-0009)

Date (dd/mm/yyyy)	Time	SO <sub>2</sub> ppm	NO <sub>x</sub> ppm	CO ppm	CO <sub>2</sub> % Vol	O <sub>2</sub> % Vol	SO <sub>2</sub> at 7%O <sub>2</sub> ppm	NO <sub>x</sub> at 7%O <sub>2</sub> ppm	CO at 7%O <sub>2</sub> ppm
03/10/2025	13:21	0.78	4.65	0.47	2.69	16.17			
03/10/2025	13:22	0.72	4.72	0.31	2.69	16.17			
03/10/2025	13:23	0.78	4.72	0.31	2.69	16.17			
03/10/2025	13:24	0.78	4.72	0.31	2.69	16.17			
03/10/2025	13:25	0.55	4.66	0.26	2.69	16.18			
03/10/2025	13:26	0.61	4.69	0.26	2.69	16.17			
03/10/2025	13:27	0.61	4.67	0.11	2.70	16.18			
03/10/2025	13:28	0.78	4.64	0.63	2.70	16.17			
03/10/2025	13:29	0.72	4.71	0.11	2.69	16.17			
03/10/2025	13:30	0.85	4.71	0.00	2.69	16.18			
03/10/2025	13:31	0.85	4.65	0.47	2.69	16.19			
03/10/2025	13:32	0.85	4.65	1.20	2.69	16.17			
03/10/2025	13:33	0.61	4.62	0.31	2.70	16.14			
03/10/2025	13:34	0.55	4.75	0.11	2.70	16.17			
03/10/2025	13:35	0.55	5.05	0.00	2.69	15.83			
03/10/2025	13:36	0.49	5.62	0.00	3.05	15.54			
03/10/2025	13:37	0.49	7.43	0.00	3.17	15.31			
03/10/2025	13:38	0.66	7.40	0.00	3.15	15.32			
03/10/2025	13:39	0.49	7.43	0.71	3.16	15.32			
03/10/2025	13:40	0.72	7.45	0.00	3.16	15.32			
03/10/2025	13:41	0.55	7.29	0.19	3.14	15.34			
03/10/2025	13:42	0.62	5.93	0.00	3.03	15.54			
03/10/2025	13:43	0.62	5.87	0.00	2.92	15.75			
03/10/2025	13:44	0.62	6.56	0.00	2.85	15.87			
03/10/2025	13:45	0.62	5.66	0.00	2.84	15.90			
03/10/2025	13:46	0.62	5.66	0.00	2.84	15.90			
03/10/2025	13:47	0.62	5.32	0.00	2.71	16.03			
03/10/2025	13:48	0.55	5.08	0.11	2.72	16.11			
03/10/2025	13:49	0.62	4.90	0.11	2.70	16.17			
03/10/2025	13:50	0.79	4.82	0.47	2.69	16.18			
Minimum		0.49	4.62	0.00	2.69	15.31	1.36	12.91	0.00
Maximum		0.85	7.45	1.20	3.17	16.19	2.37	20.81	3.35
Average		0.66	5.42	0.24	2.83	15.93	1.83	15.16	0.67

Remarks :  
1. Analytical Method for SO<sub>2</sub> is followed US EPA Method 6C. NO<sub>x</sub> is followed US EPA Method 7E. CO is followed US EPA Method 10  
2. Analytical Method for O<sub>2</sub> and CO<sub>2</sub> is followed US EPA Method 3A  
3. Emission standard  
4. Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
5. Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by (Phatsakorn Soonthornwiphat)  
Technical Specialist Section Head  
Approved by (Thapsan Yommana)  
Technical Specialist Manager

TYMS/WIWI



This document is issued by the Company under its General Conditions of Service printed overleaf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its inspection only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute part of a transaction from which the Client's rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

IE 025029

SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajinagarindra Road, Chong Nonsi, Yananawa, Bangkok 10120 t +66 (0)2 878 18 13 www.sgs.co.th

Member of the SGS Group



Report No. : 2025-500005604 / 001-3 (Page 1 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Siriracha District, Chonburi 20230  
Tel.: 038-481-555


### Analysis Report

Sample Type : Emission Air Quality  
Sampling Location : HRSG# 6 Stack  
Sampling By : Ratch Pathana Energy Public Company Limited, Chonburi province  
Laboratory Name : Mingman Sirichot, Naphaphon Taprab  
Sampling Date : 10:05-11:05 hrs. (TSP), 10:21-10:50 hrs. (CEMs)  
Received Date : October 6, 2025  
Analysis Date : October 16-21, 2025

Parameter	Unit	Value	Emission Standard <sup>1</sup>	Emission Standard <sup>2</sup> and <sup>3</sup>	Analytical Methods
Fuel Type	-	Natural Gas	-	-	-
Stack Diameter	cm	305	-	-	-
Stack Temperature	°C	84.1	-	-	-
Dry Gas Temperature	°C	32.5	-	-	-
Absolute Stack Pressure	mm.Hg	758.4	-	-	-
Air Velocity	m/s	21.46	-	-	-
O <sub>2</sub>	%	14.00	-	-	-
CO <sub>2</sub>	%	3.97	-	-	-
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr, dry	423.248	-	-	-
Moisture	%	9.90	-	-	-
TSP	mg/Nm <sup>3</sup>	0.65	-	-	-
SO <sub>2</sub>	mg/Nm <sup>3</sup>	1.30	45 <sup>1/</sup>	60 <sup>2/</sup>	-
NO <sub>x</sub> (as NO <sub>2</sub> )	g/s	0.076	2.366 <sup>1/</sup>	-	-
CO	ppm	0.73	-	-	-
PM-10	g/s	1.48	10 <sup>1/</sup>	20 <sup>2/</sup>	-
PM-2.5	g/s	0.225	1.376 <sup>1/</sup>	-	-
CO <sub>2</sub>	g/s	21.42	-	-	-
PM-10	g/s	43.15	60 <sup>1/</sup>	120 <sup>2/</sup>	-
PM-2.5	g/s	4.738	5.935 <sup>1/</sup>	-	-
CO <sub>2</sub>	g/s	0.67	-	-	-
PM-10	g/s	1.35	-	690 <sup>3/</sup>	-
PM-2.5	g/s	0.090	-	-	-

Remark : 1. N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
Sources : 1. Emission standard  
2. Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
3. Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by  (Phaisakorn Soonthornwiphat)  
Technical Specialist Section Head  
License ID: 7-197-P-0004

Approved by  (Thipsan Yommana)  
Technical Specialist Manager  
License ID: 7-197-P-0005



TYMS/MIWI

LABORATORY ADDRESS: 1/209, and 1/211 Moo1, Soi Sukhumvit 2, Ban Chiang, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed on the back. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

IE 025030

SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajanagarindra Road, Chong Nonsi, Yommana, Bangkok 10120 t +66 (0)2 678 18 13 www.sgs.co.th

Member of the SGS Group



Report No. : 2025-500005604 / 001-3 (Page 2 of 3) Issued date: October 30, 2025  
Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED  
Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Siriracha District, Chonburi 20230  
Tel.: 038-481-555

### Analysis Report

Sample Type : Emission Air Quality  
Sampling Location : HRSG# 6 Stack  
Sampling By : Ratch Pathana Energy Public Company Limited, Chonburi province  
Laboratory Name : Mingman Sirichot, Naphaphon Taprab  
Sampling Date : 11:10-12:10 hrs.  
Received Date : October 6, 2025  
Analysis Date : October 16-21, 2025

Parameter	Unit	Value	Emission Standard <sup>1</sup>	Emission Standard <sup>2</sup>	Analytical Methods
Sampling Time	hr.	11:10-12:10	-	-	-
Fuel Type	-	Natural Gas	-	-	-
Stack Diameter	cm.	305	-	-	-
Stack Temperature	°C	75.0	-	-	-
Dry Gas Temperature	°C	30.6	-	-	-
Absolute Stack Pressure	mm.Hg	758.4	-	-	-
Air Velocity	m/s	21.00	-	-	-
Volumetric Flow Rate at actual O <sub>2</sub>	Nm <sup>3</sup> /hr	423.412	-	-	-
Moisture	%	9.81	-	-	-
O <sub>2</sub>	%	14.00	-	-	-
CO <sub>2</sub>	%	3.97	-	-	-
PM-10	mg/Nm <sup>3</sup>	0.23	-	-	-
PM-2.5	mg/Nm <sup>3</sup>	0.027	-	-	-
CO <sub>2</sub>	g/s	0.027	-	-	-
PM-10	g/s	0.17	-	-	-
PM-2.5	g/s	0.033	-	-	-
CO <sub>2</sub>	g/s	0.020	-	-	-

Remark : 1. N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.  
Sources : 1. Emission standard  
2. Notification of the Ministry of Industry B.E. 2567 (2024), published in the Royal Government Gazette, Vol 142, Special part 61 D dated February 11, B.E. 2568 (2025)  
3. Notification of the Ministry of Industry, B.E. 2549 (2006)

Reviewed by  (Phaisakorn Soonthornwiphat)  
Technical Specialist Section Head

Approved by  (Thipsan Yommana)  
Technical Specialist Manager



TYMS/MIWI

LABORATORY ADDRESS: 1/209, and 1/211 Moo1, Soi Sukhumvit 2, Ban Chiang, Rayong, 21130

This document is issued by the Company under its General Conditions of Service printed on the back. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.  
Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not constitute parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

IE 025031

SGS (Thailand) Limited | 238 TRR Tower, 19<sup>th</sup>-21<sup>st</sup> Floor, Naradhiwas Rajanagarindra Road, Chong Nonsi, Yommana, Bangkok 10120 t +66 (0)2 678 18 13 www.sgs.co.th

Member of the SGS Group



## TEST REPORT

CUSTOMER	: Ratch Pathana Energy Public Company Limited
ADDRESS	: 636 Moo 11 Sukdapham 8 Rd., Nongkham, Sriracha, Chonburi 20230
SAMPLE SOURCE	: Ratch Pathana Energy Public Company Limited
SAMPLE NAME	: ชุมชนบ้านหนองพญา (UTM 47P 711526E, 1447065N)
RECEIVED DATE	: 15/10/2025
TESTED DATE	: 15/10/2025-17/10/2025
	: A
	: 2

PARAMETER *	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>†</sup>	UNIT
Total Suspended Particulate (TSP)	Gravimetric Method	01-02/10/2025	0.090	0.33	mg/m <sup>3</sup>
		02-03/10/2025	0.108	0.33	mg/m <sup>3</sup>
		03-04/10/2025	0.086	0.33	mg/m <sup>3</sup>
		04-05/10/2025	0.064	0.33	mg/m <sup>3</sup>
		05-06/10/2025	0.055	0.33	mg/m <sup>3</sup>
		06-07/10/2025	0.071	0.33	mg/m <sup>3</sup>
		07-08/10/2025	0.080	0.33	mg/m <sup>3</sup>

<sup>1/</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.



(Miss Thanatporn Klinsoon)

21/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

2000

Page 1/1

FM-1 AB-041/0/01-08-47

Report No. : 2025-500005604 / 001-3 (Page 3 of 3)

Client : RATCH PATHANA ENERGY PUBLIC COMPANY LIMITED

Address : 636 Moo11, Sukhaphiban 8 Road, Nong Kham Sub-District Srracha District, Chonburi 20230  
Tel : 038-481-5555

Issued date: October 30, 2025

## Analysis Report

**Sample Type** : Emission Air Quality  
**Measurement Location** : HRS# 6 Stack  
**Measurement By** : Ratch Pathana Energy Public Company Limited, Chonburi province  
**Measurement Date** : October 3, 2025  
**Measurement Time** : 10:21-10:50 hrs.

Date (dd/mm/yyyy)	Time	SO <sub>2</sub> ppm	NO <sub>x</sub> ppm	CO ppm	CO <sub>2</sub> %vol	O <sub>2</sub> %vol	SO <sub>2</sub> at 7%O <sub>2</sub> ppm	NO <sub>x</sub> at 7%O <sub>2</sub> ppm	CO at 7%O <sub>2</sub> ppm
03/10/2025	10:21	0.78	20.37	0.76	3.95	14.92			
03/10/2025	10:22	0.78	20.23	0.45	3.93	14.04			
03/10/2025	10:23	0.78	19.59	0.93	3.92	14.08			
03/10/2025	10:24	0.72	19.86	0.98	3.93	14.06			
03/10/2025	10:25	0.72	19.97	0.47	3.94	14.06			
03/10/2025	10:26	0.72	20.73	0.83	3.95	14.02			
03/10/2025	10:27	0.78	20.58	0.83	3.95	14.03			
03/10/2025	10:28	0.90	20.54	0.98	3.95	14.04			
03/10/2025	10:29	0.90	20.46	0.32	3.94	14.05			
03/10/2025	10:30	0.90	21.01	0.83	3.96	14.00			
03/10/2025	10:31	0.96	22.06	0.83	3.98	13.96			
03/10/2025	10:32	0.74	21.86	0.98	3.98	13.98			
03/10/2025	10:33	0.74	22.03	0.52	3.97	13.98			
03/10/2025	10:34	0.74	21.77	0.47	3.99	13.99			
03/10/2025	10:35	0.74	22.06	0.32	3.98	13.97			
03/10/2025	10:36	0.74	21.86	0.38	3.98	13.98			
03/10/2025	10:37	0.74	21.86	0.38	3.98	13.98			
03/10/2025	10:38	0.74	22.00	0.83	3.99	13.98			
03/10/2025	10:39	0.74	22.00	0.83	3.99	13.98			
03/10/2025	10:40	0.74	22.18	0.67	3.97	13.98			
03/10/2025	10:41	0.67	21.98	0.52	3.97	14.00			
03/10/2025	10:42	0.74	22.08	0.67	3.98	13.98			
03/10/2025	10:43	0.74	21.96	0.67	3.98	13.99			
03/10/2025	10:44	0.74	21.87	0.67	3.97	13.99			
03/10/2025	10:45	0.74	21.99	0.67	3.97	13.99			
03/10/2025	10:46	0.74	21.77	0.67	3.97	13.99			
03/10/2025	10:47	0.45	22.14	0.32	4.00	13.97			
03/10/2025	10:48	0.55	22.25	0.32	3.98	13.97			
03/10/2025	10:49	0.49	21.92	0.67	3.97	13.99			
03/10/2025	10:50	0.55	21.88	0.83	3.98	13.98			
Minimum		0.45	19.59	0.32	3.92	13.96	0.90	39.47	0.64
Maximum		0.96	22.06	0.98	3.99	14.00	1.94	18.83	1.98
Average		0.73	21.42	0.67	3.97	14.00	1.00	43.33	0.90

Remarks :	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	

Reviewed by

Approved by

(Phatsakorn Soonthornwiphat)  
Technical Specialist Section Head  
License ID: 2-197-9-0004

(Thepsan Yommana)  
Technical Specialist Manager  
License ID: 2-197-0-0005



TY/MS/WI/WI

This document is issued by the Company under its General Conditions of Service printed overleaf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any poster of this document is advised that information contained herein reflects the Company's findings at the time of its interception only and within the limits of Cuern's instructions, if any. The Company's sole responsibility is to its Client and this document does not entitle parties to a transaction from exercising all their rights and obligations under the transaction document. Any unauthorized alteration, forgery or falsification of the content of this document is unlawful and offenders may be prosecuted under the fullest extent of the law.

025032

SGS (Thailand) Limited  
238 TFR Tower, 19<sup>th</sup>, 21<sup>st</sup> Floor, Naradhiwas Rajanagarindra Road, Chong Nonsi, Yannawa,  
Bangkok 10120 t +66 (0)2 678 18 13 www.sgs.co.th

Member of the SCS Group

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
883 หมู่ 11 อ.สุรนันทน์ 8 ม.บ.นนทบุรี อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1187, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
883 หมู่ 11 อ.สุรนันทน์ 8 ม.บ.นนทบุรี อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1187, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.com

Request No. ATR6810023

Report No. 6810-0654 - 6810-0660

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapharm 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : ขุมน้ำมันหนองพังพวย (UTM 47P 711526E, 1447065N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100654 - A68100660  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 10 micrometers (PM 10)	Gravimetric Method	01-02/10/2025	0.022	0.12	mg/m <sup>3</sup>
		02-03/10/2025	0.064	0.12	mg/m <sup>3</sup>
		03-04/10/2025	0.060	0.12	mg/m <sup>3</sup>
		04-05/10/2025	0.037	0.12	mg/m <sup>3</sup>
		05-06/10/2025	0.035	0.12	mg/m <sup>3</sup>
		06-07/10/2025	0.041	0.12	mg/m <sup>3</sup>
		07-08/10/2025	0.043	0.12	mg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.

REMARK:

- \* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klangetch)



Approved By  
(Miss Thanaporn Klinasopon)

21/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapharm 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : ขุมน้ำมันหนองพังพวย (UTM 47P 711526E, 1447065N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100668 - A68100674  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 2.5 micrometers (PM 2.5)	Gravimetric Method	01-02/10/2025	16.7	37.5	µg/m <sup>3</sup>
		02-03/10/2025	17.5	37.5	µg/m <sup>3</sup>
		03-04/10/2025	20.5	37.5	µg/m <sup>3</sup>
		04-05/10/2025	14.9	37.5	µg/m <sup>3</sup>
		05-06/10/2025	30.0	37.5	µg/m <sup>3</sup>
		06-07/10/2025	12.2	37.5	µg/m <sup>3</sup>
		07-08/10/2025	33.8	37.5	µg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board B.E. 2565 (2022) Standard for 24-hr Average.

REMARK:

- \* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klangetch)



Approved By  
(Miss Thanaporn Klinasopon)

21/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY


Request No. ATR6810023  
Report No. 6810-0682 - 6810-0688

## TEST REPORT

CUSTOMER : Ratch Pathanaa Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathanaa Energy Public Company Limited  
SAMPLE NAME : บ้านห้วยเหล็ก (UTM 47P 710937E, 1448995N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100682 - A68100688  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Total Suspended Particulate (TSP)	Gravimetric Method	01-02/10/2025	0.038	0.33	mg/m <sup>3</sup>
		02-03/10/2025	0.059	0.33	mg/m <sup>3</sup>
		03-04/10/2025	0.053	0.33	mg/m <sup>3</sup>
		04-05/10/2025	0.038	0.33	mg/m <sup>3</sup>
		05-06/10/2025	0.032	0.33	mg/m <sup>3</sup>
		06-07/10/2025	0.039	0.33	mg/m <sup>3</sup>
		07-08/10/2025	0.047	0.33	mg/m <sup>3</sup>

**REMARK:**  
<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klungsuech)

Approved By   
(Miss Thanaporn Klinasopon)  
21/10/2025  
บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER : Ratch Pathanaa Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathanaa Energy Public Company Limited  
SAMPLE NAME : บ้านห้วยเหล็ก (UTM 47P 710937E, 1448995N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100675 - A68100681  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 10 micrometers (PM 10)	Gravimetric Method	01-02/10/2025	0.022	0.12	mg/m <sup>3</sup>
		02-03/10/2025	0.037	0.12	mg/m <sup>3</sup>
		03-04/10/2025	0.040	0.12	mg/m <sup>3</sup>
		04-05/10/2025	0.023	0.12	mg/m <sup>3</sup>
		05-06/10/2025	0.022	0.12	mg/m <sup>3</sup>
		06-07/10/2025	0.022	0.12	mg/m <sup>3</sup>
		07-08/10/2025	0.028	0.12	mg/m <sup>3</sup>

**REMARK:**  
<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klungsuech)

Approved By   
(Miss Thanaporn Klinasopon)  
21/10/2025  
บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





ISO/IEC 17025

Request No. ATR6810023  
Report No. 6810-0689 - 6810-0695

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : บ้านห้วยลึก (UTM 47P 710937E, 1448995N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100689 - A68100695  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT <sup>2</sup>	STD <sup>1</sup>	UNIT
Particulate matter less than or Equal 2.5 micrometers (PM 2.5)	Gravimetric Method	01-02/10/2025	< 2.0	37.5	µg/m <sup>3</sup>
		02-03/10/2025	20.5	37.5	µg/m <sup>3</sup>
		03-04/10/2025	35.8	37.5	µg/m <sup>3</sup>
		04-05/10/2025	10.6	37.5	µg/m <sup>3</sup>
		05-06/10/2025	20.6	37.5	µg/m <sup>3</sup>
		06-07/10/2025	6.4	37.5	µg/m <sup>3</sup>
		07-08/10/2025	25.8	37.5	µg/m <sup>3</sup>

## REMARK:

<sup>1</sup> Notification of The National Environmental Board B.E. 2565 (2022) Standard for 24-hr Average.  
<sup>2</sup> LOQ = Level of Quantitation [LOQ of Particulate matter less than or Equal 2.5 micrometers = 2.0 µg/m<sup>3</sup>]  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klengpetch)

Approved By  
(Miss Thanaporn Klinsoopon)บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
21/10/2025REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



ISO/IEC 17025

Request No. ATR6810023  
Report No. 6810-0703 - 6810-0709

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : ชุมชนบ้านหนองพาน (UTM 47P 712729E, 1449300N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100703 - A68100709  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1</sup>	UNIT
Total Suspended Particulate (TSP)	Gravimetric Method	01-02/10/2025	0.058	0.33	mg/m <sup>3</sup>
		02-03/10/2025	0.078	0.33	mg/m <sup>3</sup>
		03-04/10/2025	0.061	0.33	mg/m <sup>3</sup>
		04-05/10/2025	0.030	0.33	mg/m <sup>3</sup>
		05-06/10/2025	0.041	0.33	mg/m <sup>3</sup>
		06-07/10/2025	0.040	0.33	mg/m <sup>3</sup>
		07-08/10/2025	0.055	0.33	mg/m <sup>3</sup>

## REMARK:

<sup>1</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klengpetch)

Approved By  
(Miss Thanaporn Klinsoopon)

21/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. ATR6810023

Report No. 6810-0696 - 6810-0702

## TEST REPORT

CUSTOMER : Ratch Padhana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Padhana Energy Public Company Limited  
SAMPLE NAME : ขุมหินน้ำพันองจาน (UTM 47P 712729E, 1449300N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100696 - A68100702  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 10 micrometers (PM 10)	Gravimetric Method	01-02/10/2025	0.030	0.12	mg/m <sup>3</sup>
		02-03/10/2025	0.041	0.12	mg/m <sup>3</sup>
		03-04/10/2025	0.040	0.12	mg/m <sup>3</sup>
		04-05/10/2025	0.016	0.12	mg/m <sup>3</sup>
		05-06/10/2025	0.024	0.12	mg/m <sup>3</sup>
		06-07/10/2025	0.020	0.12	mg/m <sup>3</sup>
		07-08/10/2025	0.032	0.12	mg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.

REMARK:

- Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klungsuech)



Approved By   
(Miss Thanaiporn Klinsepon)

21/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Page 1/1

FM-LAB-041/001-08-47

Request No. ATR6810023

Report No. 6810-0710 - 6810-0716

## TEST REPORT

CUSTOMER : Ratch Padhana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Padhana Energy Public Company Limited  
SAMPLE NAME : ขุมหินน้ำพันองจาน (UTM 47P 712729E, 1449300N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100710 - A68100716  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 2.5 micrometers (PM 2.5)	Gravimetric Method	01-02/10/2025	11.8	37.5	µg/m <sup>3</sup>
		02-03/10/2025	14.4	37.5	µg/m <sup>3</sup>
		03-04/10/2025	15.0	37.5	µg/m <sup>3</sup>
		04-05/10/2025	8.8	37.5	µg/m <sup>3</sup>
		05-06/10/2025	10.6	37.5	µg/m <sup>3</sup>
		06-07/10/2025	8.0	37.5	µg/m <sup>3</sup>
		07-08/10/2025	12.1	37.5	µg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board B.E. 2565 (2022) Standard for 24-hr Average.

REMARK:

- Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klungsuech)



Approved By   
(Miss Thanaiporn Klinsepon)

21/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Page 1/1

FM-LAB-041/001-08-47

Request No. ATR6810023

Report No. 6810-0724 - 6810-0730

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : โรงเรือนอนุบาลสัตว์ปีก (UTM 47P 713156E, 1449314N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100724 - A68100730  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Total Suspended Particulate (TSP)	Gravimetric Method	01-02/10/2025	0.057	0.33	mg/m <sup>3</sup>
		02-03/10/2025	0.073	0.33	mg/m <sup>3</sup>
		03-04/10/2025	0.062	0.33	mg/m <sup>3</sup>
		04-05/10/2025	0.045	0.33	mg/m <sup>3</sup>
		05-06/10/2025	0.050	0.33	mg/m <sup>3</sup>
		06-07/10/2025	0.053	0.33	mg/m <sup>3</sup>
		07-08/10/2025	0.056	0.33	mg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.

## REMARK:

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klangdech)



Approved By

(Miss Thanaporn Klinsopon)

21/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FM-LAB-041/001-08-47

COPY

Request No. ATR6810023

Report No. 6810-0717 - 6810-0723

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : โรงเรือนอนุบาลสัตว์ปีก (UTM 47P 713156E, 1449314N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100717 - A68100723  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 10 micrometers (PM 10)	Gravimetric Method	01-02/10/2025	0.028	0.12	mg/m <sup>3</sup>
		02-03/10/2025	0.033	0.12	mg/m <sup>3</sup>
		03-04/10/2025	0.036	0.12	mg/m <sup>3</sup>
		04-05/10/2025	0.025	0.12	mg/m <sup>3</sup>
		05-06/10/2025	0.022	0.12	mg/m <sup>3</sup>
		06-07/10/2025	0.020	0.12	mg/m <sup>3</sup>
		07-08/10/2025	0.027	0.12	mg/m <sup>3</sup>

<sup>1)</sup> Notification of The National Environmental Board Volume 24 B.E.2547 (2004) Standard for 24-hr Average.

## REMARK:

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klangdech)



Approved By

(Miss Thanaporn Klinsopon)

21/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FM-LAB-041/001-08-47

COPY



Request No. ATR6810023  
Report No. 6810-0731 - 6810-0737

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE NAME : โรงเรือนอนุบาลสัตว์ (UTM 47P 713156E, 1449314N)  
RECEIVED DATE : 15/10/2025  
TESTED DATE : 15/10/2025-17/10/2025  
SAMPLE NO. : A68100731 - A68100737  
REPORTED DATE : 21/10/2025

PARAMETER*	TEST METHOD	SAMPLING DATE	RESULT	STD <sup>1)</sup>	UNIT
Particulate matter less than or Equal 2.5 micrometers (PM 2.5)	Gravimetric Method	01-02/10/2025	11.2	37.5	µg/m <sup>3</sup>
		02-03/10/2025	16.2	37.5	µg/m <sup>3</sup>
		03-04/10/2025	16.3	37.5	µg/m <sup>3</sup>
		04-05/10/2025	10.5	37.5	µg/m <sup>3</sup>
		05-06/10/2025	10.5	37.5	µg/m <sup>3</sup>
		06-07/10/2025	10.6	37.5	µg/m <sup>3</sup>
		07-08/10/2025	11.6	37.5	µg/m <sup>3</sup>

**REMARK:**  
<sup>1)</sup> Notification of The National Environmental Board B.E. 2565 (2022) Standard for 24-hr Average.  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works.  
(Sampling By Mr. Apiwat Klingsopon)



Approved By :   
(Miss Thanaporn Klinsepon)  
21/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R 087  
Report No. R6810-3295 - R6810-3301

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : ขุขันธ์บ้านหนองพังพวย  
PARAMETER\* : Sulfur Dioxide  
DETERMINATION METHOD : UV-Fluorescence  
INSTRUMENT : API Model T100 S/N 5700

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
09:00 - 10:00 <sup>2)</sup>	0.002	0.007	0.005	0.005	0.006	0.005	0.005	ppm
10:00 - 11:00	0.001	0.006	0.005	0.005	0.004	0.005	0.004	ppm
11:00 - 12:00	0.002	0.006	0.004	0.006	0.005	0.005	0.005	ppm
12:00 - 13:00	0.005	0.005	0.004	0.005	0.006	0.004	0.006	ppm
13:00 - 14:00	0.009	0.005	0.006	0.004	0.007	0.004	0.004	ppm
14:00 - 15:00	0.004	0.006	0.006	0.005	0.006	0.005	<0.001	ppm
15:00 - 16:00	0.005	0.006	0.005	0.004	0.007	0.005	0.002	ppm
16:00 - 17:00	0.005	0.006	0.005	0.004	0.005	0.005	0.006	ppm
17:00 - 18:00	0.006	0.006	0.005	0.005	0.005	0.005	0.006	ppm
18:00 - 19:00	0.006	0.006	0.005	0.005	0.006	0.006	0.005	ppm
19:00 - 20:00	0.006	0.007	0.006	0.005	0.005	0.005	0.005	ppm
20:00 - 21:00	0.006	0.007	0.005	0.006	0.006	0.005	0.006	ppm
21:00 - 22:00	0.006	0.007	0.006	0.006	0.005	0.005	0.006	ppm
22:00 - 23:00	0.006	0.006	0.006	0.006	0.005	0.005	0.005	ppm
23:00 - 00:00	0.006	0.006	0.005	0.006	0.005	0.005	0.006	ppm
00:00 - 01:00	0.007	0.007	0.005	0.005	0.005	0.005	0.006	ppm
01:00 - 02:00	0.007	0.008	0.005	0.006	0.005	0.005	0.006	ppm
02:00 - 03:00	0.007	0.007	0.005	0.006	0.006	0.005	0.007	ppm
03:00 - 04:00	0.007	0.007	0.005	0.007	0.005	0.006	0.006	ppm
04:00 - 05:00	0.007	0.007	0.005	0.006	0.006	0.006	0.006	ppm
05:00 - 06:00	0.007	0.007	0.005	0.006	0.005	0.006	0.007	ppm
06:00 - 07:00	0.007	0.006	0.007	0.007	0.005	0.007	0.007	ppm
07:00 - 08:00	0.007	0.006	0.006	0.005	0.005	0.005	0.007	ppm
08:00 - 09:00	0.007	0.006	0.005	0.006	0.005	0.006	0.007	ppm
Maximum 1 hr.	0.009	0.008	0.007	0.007	0.007	0.007	0.007	ppm
Average 24 hr.	0.006	0.006	0.005	0.005	0.005	0.005	0.005	ppm
Standard (1 hr.) <sup>1)</sup>	0.30	0.30	0.12	0.30	0.30	0.30	0.30	ppm
Standard Average 24 hr. <sup>2)</sup>	0.12	0.12	0.12	0.12	0.12	0.12	0.12	ppm

**REMARK:**  
<sup>1)</sup> Notification of The National Environmental Board Volume 12 B.E. 2538 (1995) and Volume 21 B.E. 2544 (2001)  
<sup>2)</sup> Notification of The National Environmental Board Volume 24 B.E. 2547 (2004)

<sup>3)</sup> Start Time  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
(Measurement By Mr. Apiwat Klingsopon)



Approved By :   
(MS. THANAPORN KLINSOPON)  
17/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1087  
Report No. R6810-3302 - R6810-3308

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : ชุมชนบ้านหนองจันทอง  
PARAMETER\* : Nitrogen Dioxide  
DETERMINATION METHOD : Chemiluminescence  
INSTRUMENT : API Model T200 SN 9756

SAMPLE NO. : 40719-40725  
SAMPLING DATE : 01/08/10/2025  
RECEIVED DATE : 08/10/2025  
REPORTED DATE : 17/10/2025

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
09:00 - 10:00 <sup>1</sup>	0.006	0.006	0.012	0.004	0.006	0.005	0.002	ppm
10:00 - 11:00	0.008	0.005	0.011	0.002	0.008	0.004	0.009	ppm
11:00 - 12:00	0.005	0.008	0.018	0.002	0.005	0.004	0.005	ppm
12:00 - 13:00	0.008	0.007	0.018	0.004	0.002	0.004	0.008	ppm
13:00 - 14:00	0.004	0.009	0.020	0.004	0.004	0.004	0.015	ppm
14:00 - 15:00	0.005	0.015	0.019	0.011	0.005	0.011	0.014	ppm
15:00 - 16:00	0.014	0.009	0.018	0.008	0.004	0.007	0.012	ppm
16:00 - 17:00	0.013	0.008	0.018	0.007	0.001	0.010	0.012	ppm
17:00 - 18:00	0.010	0.013	0.025	0.010	0.002	0.010	0.007	ppm
18:00 - 19:00	0.018	0.011	0.021	0.014	0.002	0.008	0.009	ppm
19:00 - 20:00	0.018	0.013	0.025	0.007	0.006	0.006	0.008	ppm
20:00 - 21:00	0.011	0.011	0.024	0.007	0.004	0.008	0.008	ppm
21:00 - 22:00	0.009	0.015	0.019	0.004	0.005	0.008	0.004	ppm
22:00 - 23:00	0.010	0.017	0.017	0.007	0.004	0.007	0.005	ppm
23:00 - 00:00	0.011	0.016	0.013	0.006	0.006	0.007	0.007	ppm
00:00 - 01:00	0.009	0.012	0.010	0.008	0.005	0.003	0.009	ppm
01:00 - 02:00	0.007	0.006	0.008	0.005	0.002	0.002	0.008	ppm
02:00 - 03:00	0.008	0.007	0.006	0.004	0.002	0.002	0.005	ppm
03:00 - 04:00	0.008	0.007	0.005	0.004	0.003	0.003	0.004	ppm
04:00 - 05:00	0.008	0.008	0.007	0.005	0.003	0.003	0.004	ppm
05:00 - 06:00	0.008	0.012	0.008	0.004	0.004	0.005	0.003	ppm
06:00 - 07:00	0.009	0.010	0.006	0.007	0.005	0.005	0.004	ppm
07:00 - 08:00	0.008	0.012	0.006	0.003	0.004	0.005	0.003	ppm
08:00 - 09:00	0.009	0.010	0.006	0.003	0.005	0.003	0.004	ppm
09:00 - 10:00	0.018	0.017	0.025	0.014	0.008	0.011	0.015	ppm
Maximum 1 hr.	0.018	0.017	0.025	0.014	0.008	0.011	0.015	ppm
Average 24 hr.	0.009	0.010	0.014	0.006	0.004	0.005	0.007	ppm
Standard (1 hr.) <sup>1</sup>	0.17	0.17	0.17	0.17	0.17	0.17	0.17	ppm

REMARK : <sup>1</sup> Notification of The National Environmental Board Volume 33 B.E. 2552 (2009)<sup>2</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works

(Measurement By Mr. Apiwat Klengpetch)



Approved By.....

(MS. THANATPORN KLINSOPON)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

17/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Request No. LA68-R1087  
Report No. R6810-3281 - R6810-3287

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านหัวมด  
PARAMETER\* : Sulfur Dioxide  
DETERMINATION METHOD : UV-Fluorescence  
INSTRUMENT : API Model M100E SN 3220

SAMPLE NO. : 40698-40704  
SAMPLING DATE : 01-08/10/2025  
RECEIVED DATE : 08/10/2025  
REPORTED DATE : 17/10/2025

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
10:00 - 11:00 <sup>1</sup>	0.013	0.016	0.014	0.013	0.013	0.015	0.013	ppm
11:00 - 12:00	0.012	0.016	0.014	0.013	0.013	0.015	0.013	ppm
12:00 - 13:00	0.014	0.016	0.014	0.015	0.013	0.014	0.013	ppm
13:00 - 14:00	0.013	0.015	0.014	0.015	0.014	0.013	0.013	ppm
14:00 - 15:00	0.013	0.015	0.014	0.015	0.014	0.013	0.013	ppm
15:00 - 16:00	0.013	0.014	0.014	0.014	0.013	0.013	0.013	ppm
16:00 - 17:00	0.013	0.014	0.014	0.013	0.014	0.013	0.013	ppm
17:00 - 18:00	0.013	0.014	0.014	0.013	0.014	0.013	0.013	ppm
18:00 - 19:00	0.013	0.014	0.014	0.014	0.015	0.013	0.013	ppm
19:00 - 20:00	0.014	0.014	0.014	0.013	0.013	0.013	0.013	ppm
20:00 - 21:00	0.012	0.014	0.013	0.013	0.013	0.013	0.013	ppm
21:00 - 22:00	0.014	0.014	0.014	0.013	0.013	0.013	0.013	ppm
22:00 - 23:00	0.014	0.014	0.014	0.013	0.015	0.015	0.014	ppm
23:00 - 00:00	0.014	0.014	0.014	0.013	0.014	0.013	0.013	ppm
00:00 - 01:00	0.014	0.014	0.014	0.013	0.013	0.013	0.013	ppm
01:00 - 02:00	0.014	0.015	0.014	0.014	0.013	0.013	0.013	ppm
02:00 - 03:00	0.014	0.016	0.013	0.013	0.015	0.013	0.013	ppm
03:00 - 04:00	0.014	0.016	0.013	0.013	0.013	0.013	0.013	ppm
04:00 - 05:00	0.014	0.014	0.013	0.013	0.014	0.013	0.013	ppm
05:00 - 06:00	0.014	0.014	0.013	0.013	0.013	0.014	0.013	ppm
06:00 - 07:00	0.014	0.014	0.014	0.013	0.015	0.013	0.013	ppm
07:00 - 08:00	0.016	0.014	0.013	0.013	0.015	0.013	0.014	ppm
08:00 - 09:00	0.015	0.014	0.014	0.013	0.015	0.013	0.014	ppm
09:00 - 10:00	0.015	0.014	0.013	0.013	0.015	0.013	0.013	ppm
Maximum 1 hr.	0.016	0.016	0.014	0.015	0.015	0.015	0.014	ppm
Average 24 hr.	0.014	0.014	0.014	0.013	0.014	0.013	0.013	ppm
Standard (1 hr.) <sup>1</sup>	0.30	0.30	0.30	0.30	0.30	0.30	0.30	ppm
Standard (Average 24 hr.) <sup>2</sup>	0.12	0.12	0.12	0.12	0.12	0.12	0.12	ppm

REMARK : <sup>1</sup> Notification of The National Environmental Board Volume 12 B.E. 2538 (1995) and Volume 21 B.E. 2544 (2001)<sup>2</sup> Notification of The National Environmental Board Volume 24 B.E. 2547 (2004)<sup>3</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works

(Measurement By Mr. Apiwat Klengpetch)



Approved By.....

(MS. THANATPORN KLINSOPON)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

17/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



## บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.นันทนาราม อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
ISO/IEC 17025 Website : http://www.etc1992.com E-mail : info@etc1992.com



## บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.นันทนาราม อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
ISO/IEC 17025 Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1087  
Report No. R6810-3288 - R6810-3294

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านห้วยจิ้งจอก  
PARAMETER\* : Nitrogen Dioxide  
DETERMINATION METHOD : Chemiluminescence  
INSTRUMENT : API Model T200 S/N 7866

SAMPLE NO. : 40705-40711  
SAMPLING DATE : 01/08/10/2025  
RECEIVED DATE : 08/10/2025  
REPORTED DATE : 17/10/2025

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
10:00 - 11:00 <sup>1)</sup>	0.003	0.017	0.014	0.008	0.006	0.008	0.006	ppm
11:00 - 12:00	0.004	0.012	0.019	0.007	0.007	0.007	0.006	ppm
12:00 - 13:00	0.007	0.013	0.019	0.008	0.010	0.008	0.006	ppm
13:00 - 14:00	0.007	0.012	0.010	0.011	0.007	0.006	0.006	ppm
14:00 - 15:00	0.005	0.013	0.010	0.005	0.005	0.005	0.009	ppm
15:00 - 16:00	0.008	0.015	0.015	0.011	0.004	0.012	0.009	ppm
16:00 - 17:00	0.012	0.013	0.021	0.015	0.013	0.009	0.008	ppm
17:00 - 18:00	0.014	0.016	0.028	0.015	0.008	0.012	0.010	ppm
18:00 - 19:00	0.014	0.018	0.030	0.013	0.009	0.016	0.012	ppm
19:00 - 20:00	0.021	0.013	0.030	0.013	0.010	0.018	0.012	ppm
20:00 - 21:00	0.008	0.018	0.030	0.012	0.012	0.011	0.011	ppm
21:00 - 22:00	0.012	0.014	0.021	0.012	0.011	0.015	0.008	ppm
22:00 - 23:00	0.013	0.016	0.018	0.010	0.009	0.012	0.011	ppm
23:00 - 00:00	0.012	0.017	0.017	0.013	0.007	0.008	0.013	ppm
00:00 - 01:00	0.010	0.014	0.017	0.011	0.006	0.006	0.012	ppm
01:00 - 02:00	0.008	0.014	0.019	0.010	0.005	0.006	0.011	ppm
02:00 - 03:00	0.008	0.017	0.015	0.011	0.006	0.008	0.011	ppm
03:00 - 04:00	0.008	0.020	0.013	0.012	0.006	0.010	0.010	ppm
04:00 - 05:00	0.008	0.022	0.012	0.012	0.007	0.011	0.010	ppm
05:00 - 06:00	0.008	0.023	0.018	0.014	0.011	0.010	0.009	ppm
06:00 - 07:00	0.010	0.020	0.015	0.010	0.010	0.009	0.006	ppm
07:00 - 08:00	0.017	0.022	0.015	0.014	0.015	0.014	0.007	ppm
08:00 - 09:00	0.018	0.024	0.015	0.011	0.013	0.011	0.006	ppm
09:00 - 10:00	0.009	0.018	0.010	0.007	0.013	0.008	0.005	ppm
Maximum 1 hr.	0.021	0.024	0.030	0.015	0.015	0.018	0.013	ppm
Average 24 hr.	0.010	0.017	0.018	0.011	0.009	0.010	0.009	ppm
Standard (1 hr.) <sup>1)</sup>	0.17	0.17	0.17	0.17	0.17	0.17	0.17	ppm

REMARK : <sup>1)</sup> Notification of The National Environmental Board Volume 33 B.E. 2552 (2009)

<sup>2)</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works

(Measurement By Mr. Apiwat Klungteich)



Approved By.....

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

17/10/2025

(MS. THANATPORN KLINSOPON)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านห้วยจิ้งจอก  
PARAMETER\* : Sulfur Dioxide  
DETERMINATION METHOD : UV-Fluorescence  
INSTRUMENT : API Model M100E S/N 3138

SAMPLE NO. : 40684-40690  
SAMPLING DATE : 01/08/10/2025  
RECEIVED DATE : 08/10/2025  
REPORTED DATE : 17/10/2025

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
11:00 - 12:00 <sup>1)</sup>	0.006	0.008	0.007	0.007	0.007	0.006	0.007	ppm
12:00 - 13:00	0.006	0.006	0.007	0.007	0.007	0.006	0.007	ppm
13:00 - 14:00	0.006	0.007	0.007	0.007	0.007	0.006	0.006	ppm
14:00 - 15:00	0.007	0.007	0.007	0.007	0.007	0.007	0.006	ppm
15:00 - 16:00	0.006	0.006	0.007	0.007	0.007	0.007	0.007	ppm
16:00 - 17:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
17:00 - 18:00	0.006	0.007	0.007	0.007	0.007	0.007	0.007	ppm
18:00 - 19:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
19:00 - 20:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
20:00 - 21:00	0.008	0.008	0.007	0.007	0.007	0.007	0.007	ppm
21:00 - 22:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
22:00 - 23:00	0.007	0.008	0.008	0.007	0.006	0.007	0.007	ppm
23:00 - 00:00	0.007	0.008	0.008	0.007	0.007	0.007	0.007	ppm
00:00 - 01:00	0.007	0.008	0.008	0.007	0.007	0.007	0.007	ppm
01:00 - 02:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
02:00 - 03:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
03:00 - 04:00	0.007	0.007	0.007	0.007	0.006	0.007	0.007	ppm
04:00 - 05:00	0.008	0.007	0.007	0.007	0.006	0.007	0.007	ppm
05:00 - 06:00	0.007	0.007	0.007	0.007	0.006	0.007	0.007	ppm
06:00 - 07:00	0.008	0.007	0.007	0.007	0.006	0.007	0.008	ppm
07:00 - 08:00	0.008	0.007	0.007	0.007	0.006	0.007	0.008	ppm
08:00 - 09:00	0.008	0.007	0.007	0.007	0.006	0.007	0.007	ppm
09:00 - 10:00	0.007	0.007	0.007	0.007	0.006	0.007	0.007	ppm
10:00 - 11:00	0.007	0.007	0.007	0.007	0.006	0.007	0.008	ppm
Maximum 1 hr.	0.008	0.008	0.007	0.007	0.007	0.007	0.008	ppm
Average 24 hr.	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
Standard (1 hr.) <sup>1)</sup>	0.30	0.30	0.30	0.30	0.30	0.30	0.30	ppm
Standard Average 24 hr. <sup>2)</sup>	0.12	0.12	0.12	0.12	0.12	0.12	0.12	ppm

REMARK : <sup>1)</sup> Notification of The National Environmental Board Volume 12 B.E. 2538 (1995) and Volume 21 B.E. 2544 (2001)

<sup>2)</sup> Notification of The National Environmental Board Volume 24 B.E. 2547 (2004)

<sup>3)</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works

(Measurement By Mr. Apiwat Klungteich)



Approved By.....

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

17/10/2025

(MS. THANATPORN KLINSOPON)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 ถนนพหลโยธิน 8 แขวงจตุจักร เขตจตุจักร กรุงเทพฯ 10130  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 ถนนพหลโยธิน 8 แขวงจตุจักร เขตจตุจักร กรุงเทพฯ 10130  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1087  
 Report No. R6810-3274 - R6810-3280

TEST REPORT

CUSTOMER : Ratch Patham Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Patham Energy Public Company Limited  
 SAMPLE POINT : กรุงเทพมหานคร  
 PARAMETER\* : Nitrogen Dioxide  
 DETERMINATION METHOD : Chemiluminescence  
 INSTRUMENT : API Model T200 S/N 2004

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
11:00 - 13:00	0.003	0.007	0.012	0.006	0.001	0.010	0.005	ppm
12:00 - 13:00	0.003	0.007	0.016	0.008	0.004	0.008	0.005	ppm
13:00 - 14:00	0.005	0.007	0.018	0.008	0.010	0.008	0.007	ppm
14:00 - 15:00	0.003	0.007	0.009	0.006	0.006	0.006	0.006	ppm
15:00 - 16:00	0.004	0.011	0.009	0.012	0.004	0.005	0.005	ppm
16:00 - 17:00	0.010	0.016	0.011	0.008	0.005	0.008	0.009	ppm
17:00 - 18:00	0.014	0.011	0.015	0.009	0.004	0.012	0.006	ppm
18:00 - 19:00	0.014	0.019	0.026	0.017	0.006	0.009	0.009	ppm
19:00 - 20:00	0.018	0.022	0.023	0.020	0.011	0.011	0.012	ppm
20:00 - 21:00	0.018	0.023	0.024	0.015	0.012	0.013	0.012	ppm
21:00 - 22:00	0.010	0.028	0.030	0.010	0.013	0.012	0.010	ppm
22:00 - 23:00	0.012	0.029	0.026	0.011	0.013	0.010	0.007	ppm
23:00 - 00:00	0.014	0.026	0.020	0.008	0.011	0.008	0.014	ppm
00:00 - 01:00	0.014	0.024	0.017	0.012	0.006	0.005	0.014	ppm
01:00 - 02:00	0.011	0.021	0.017	0.010	0.007	0.003	0.016	ppm
02:00 - 03:00	0.010	0.019	0.017	0.011	0.004	0.003	0.014	ppm
03:00 - 04:00	0.010	0.020	0.013	0.007	0.004	0.006	0.014	ppm
04:00 - 05:00	0.012	0.018	0.010	0.008	0.007	0.009	0.012	ppm
05:00 - 06:00	0.008	0.019	0.010	0.005	0.007	0.010	0.010	ppm
06:00 - 07:00	0.008	0.020	0.015	0.005	0.010	0.010	0.009	ppm
07:00 - 08:00	0.008	0.021	0.018	0.003	0.011	0.011	0.009	ppm
08:00 - 09:00	0.010	0.019	0.016	0.003	0.011	0.009	0.011	ppm
09:00 - 10:00	0.008	0.014	0.011	0.004	0.010	0.007	0.008	ppm
10:00 - 11:00	0.013	0.021	0.008	0.003	0.007	0.008	0.007	ppm
Maximum 1 hr.	0.018	0.029	0.030	0.020	0.013	0.013	0.016	ppm
Average 24 hr.	0.010	0.018	0.016	0.009	0.008	0.008	0.010	ppm
Standard (1 hr.) <sup>1)</sup>	0.17	0.17	0.17	0.17	0.17	0.17	0.17	ppm

REMARK : <sup>1)</sup> Notification of The National Environmental Board Volume 33 B.E. 2552 (2009)

<sup>2)</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
 (Measurement By Mr. Apirwat Klingpetch)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

Approved By

(MS. THANATPORN KLINSOPON)

17/10/2025

COPY

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Ratch Patham Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Patham Energy Public Company Limited  
 SAMPLE POINT : กรุงเทพมหานคร  
 PARAMETER\* : Sulfur Dioxide  
 DETERMINATION METHOD : UV-Fluorescence  
 INSTRUMENT : API Model M100E S/N 3445

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
12:00 - 13:00	0.006	0.007	0.007	0.007	0.007	0.007	0.007	ppm
13:00 - 14:00	0.006	0.007	0.007	0.007	0.007	0.007	0.007	ppm
14:00 - 15:00	0.006	0.007	0.007	0.007	0.007	0.007	0.007	ppm
15:00 - 16:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
16:00 - 17:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
17:00 - 18:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
18:00 - 19:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
19:00 - 20:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
20:00 - 21:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
21:00 - 22:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
22:00 - 23:00	0.007	0.008	0.007	0.007	0.007	0.007	0.007	ppm
23:00 - 00:00	0.008	0.008	0.008	0.007	0.007	0.007	0.007	ppm
00:00 - 01:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
01:00 - 02:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
02:00 - 03:00	0.007	0.008	0.007	0.007	0.007	0.007	0.007	ppm
03:00 - 04:00	0.007	0.008	0.007	0.007	0.007	0.007	0.007	ppm
04:00 - 05:00	0.008	0.007	0.007	0.007	0.007	0.007	0.007	ppm
05:00 - 06:00	0.008	0.007	0.007	0.007	0.007	0.007	0.007	ppm
06:00 - 07:00	0.008	0.007	0.007	0.007	0.007	0.007	0.007	ppm
07:00 - 08:00	0.008	0.008	0.007	0.007	0.007	0.007	0.008	ppm
08:00 - 09:00	0.007	0.008	0.007	0.007	0.007	0.007	0.007	ppm
09:00 - 10:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
10:00 - 11:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
11:00 - 12:00	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
Maximum 1 hr.	0.008	0.008	0.007	0.007	0.007	0.007	0.008	ppm
Average 24 hr.	0.007	0.007	0.007	0.007	0.007	0.007	0.007	ppm
Standard (1 hr.) <sup>1)</sup>	0.30	0.30	0.30	0.30	0.30	0.30	0.30	ppm
Standard Average 24 hr. <sup>2)</sup>	0.12	0.12	0.12	0.12	0.12	0.12	0.12	ppm

REMARK : <sup>1)</sup> Notification of The National Environmental Board Volume 12 B.E. 2538 (1995) and Volume 21 B.E. 2544 (2001)

<sup>2)</sup> Notification of The National Environmental Board Volume 24 B.E. 2547 (2004)

<sup>3)</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
 (Measurement By Mr. Apirwat Klingpetch)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

Approved By

(MS. THANATPORN KLINSOPON)

17/10/2025

COPY

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY





Request No. LA68-R1087  
Report No. R6810-3316 - R6810-3322

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : โรงเรือนบำบัดน้ำเสีย  
PARAMETER\* : Nitrogen Dioxide  
DETERMINATION METHOD : Chemiluminescence  
INSTRUMENT : API Model T200 S/N 6758

SAMPLE NO. : 40733-40739  
SAMPLING DATE : 01-08/10/2025  
RECEIVED DATE : 08/10/2025  
REPORTED DATE : 17/10/2025

TIME / DATE	01-02/10/2025	02-03/10/2025	03-04/10/2025	04-05/10/2025	05-06/10/2025	06-07/10/2025	07-08/10/2025	UNIT
12:00 - 13:00	0.004	0.002	0.013	0.004	0.006	0.004	0.008	ppm
13:00 - 14:00	0.004	0.002	0.009	0.004	0.010	0.003	0.027	ppm
14:00 - 15:00	0.004	0.003	0.005	0.006	0.005	0.003	0.016	ppm
15:00 - 16:00	0.004	0.007	0.004	0.008	0.004	0.006	0.022	ppm
16:00 - 17:00	0.005	0.009	0.008	0.004	0.006	0.007	0.012	ppm
17:00 - 18:00	0.009	0.011	0.011	0.007	0.006	0.032	0.008	ppm
18:00 - 19:00	0.010	0.017	0.023	0.017	0.007	0.021	0.009	ppm
19:00 - 20:00	0.012	0.019	0.027	0.017	0.010	0.035	0.013	ppm
20:00 - 21:00	0.007	0.020	0.029	0.013	0.012	0.038	0.010	ppm
21:00 - 22:00	0.007	0.021	0.027	0.013	0.012	0.031	0.006	ppm
22:00 - 23:00	0.009	0.021	0.021	0.008	0.010	0.017	0.008	ppm
23:00 - 00:00	0.009	0.019	0.019	0.008	0.009	0.023	0.011	ppm
00:00 - 01:00	0.008	0.019	0.016	0.011	0.008	0.016	0.022	ppm
01:00 - 02:00	0.006	0.016	0.016	0.005	0.006	0.009	0.022	ppm
02:00 - 03:00	0.007	0.013	0.015	0.007	0.004	0.008	0.018	ppm
03:00 - 04:00	0.008	0.014	0.011	0.007	0.005	0.008	0.017	ppm
04:00 - 05:00	0.009	0.014	0.009	0.007	0.005	0.009	0.015	ppm
05:00 - 06:00	0.008	0.014	0.011	0.006	0.008	0.010	0.013	ppm
06:00 - 07:00	0.008	0.015	0.017	0.010	0.009	0.013	0.009	ppm
07:00 - 08:00	0.007	0.017	0.016	0.009	0.010	0.011	0.011	ppm
08:00 - 09:00	0.005	0.014	0.014	0.007	0.009	0.007	0.012	ppm
09:00 - 10:00	0.002	0.005	0.009	0.003	0.007	0.006	0.010	ppm
10:00 - 11:00	0.002	0.006	0.006	0.005	0.004	0.004	0.004	ppm
11:00 - 12:00	0.002	0.006	0.006	0.006	0.003	0.003	0.008	ppm
Maximum 1 hr.	0.012	0.021	0.029	0.017	0.012	0.038	0.027	ppm
Average 24 hr.	0.007	0.013	0.014	0.008	0.007	0.013	0.013	ppm
Standard (1 hr.) <sup>1)</sup>	0.17	0.17	0.17	0.17	0.17	0.17	0.17	ppm

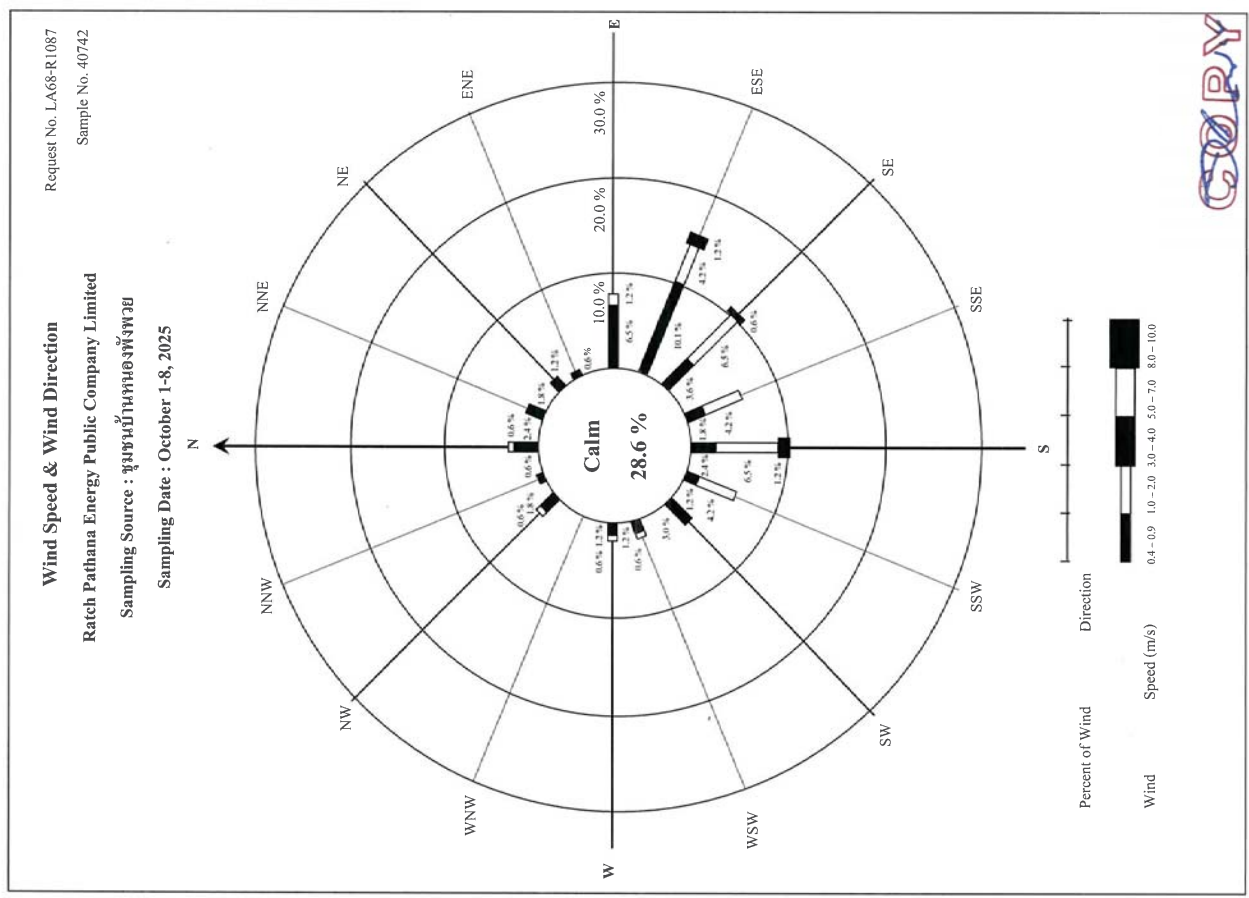
REMARK : <sup>1)</sup> Notification of The National Environmental Board Volume 33 B.E. 2552 (2009)  
<sup>2)</sup> Start Time  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
(Measurement By Mr. Apawat Klengphet)



Approved By :   
(MS. THANATPORN KLINSOPON)  
17/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY







Request No. LA68-R1087

Wind Speed & Wind Direction

Ratch Pathana Energy Public Company Limited

Sampling Source : ขุมขนบ้านหนองพญา

Sampling Date : October 1-8, 2025

Sample No. 40742

Time	October 1-2, 2025		October 2-3, 2025		October 3-4, 2025		October 4-5, 2025		October 5-6, 2025		October 6-7, 2025		October 7-8, 2025	
	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction
09:00-10:00	0.4	SSE	0.4	NW	0.4	SW	1.8	ESE	2.7	SE	0.4	E	1.8	SE
10:00-11:00	1.3	SSE	0.9	NW	0.4	E	2.7	ESE	2.7	S	1.8	SE	1.8	S
11:00-12:00	1.8	SE	0.9	WSW	0.9	SW	1.8	ESE	2.2	SE	2.2	S	1.8	S
12:00-13:00	1.3	SSW	1.3	SSW	1.8	NW	2.2	S	1.3	SE	2.7	S	1.8	S
13:00-14:00	1.3	SSE	1.3	WSW	0.9	E	1.3	SSE	0.9	ESE	2.2	S	1.8	S
14:00-15:00	1.3	E	1.3	SSW	0.9	SW	0.9	SE	1.8	SE	2.2	S	1.8	S
15:00-16:00	1.8	SE	1.3	SSW	0.9	WSW	1.3	SSW	2.2	SE	1.3	SSW	1.3	S
16:00-17:00	1.8	SSE	1.8	SSE	0.9	W	1.3	W	2.7	ESE	1.3	SE	0.9	SE
17:00-18:00	1.3	SSE	2.2	E	0.4	S	1.3	S	2.2	ESE	1.3	SE	1.3	SE
18:00-19:00	1.3	SSE	1.3	N	0.9	ESE	0.9	S	1.8	ESE	0.9	SE	0.9	E
19:00-20:00	0.9	SSE	0.4	ENE	0.0	-	0.9	SSW	1.8	ESE	0.9	ESE	0.4	ESE
20:00-21:00	0.9	SSE	0.0	-	0.0	-	0.4	S	1.3	ESE	0.9	SE	0.4	ESE
21:00-22:00	0.4	ESE	0.4	N	0.4	NE	0.9	ESE	0.0	-	0.9	ESE	0.9	SW
22:00-23:00	0.0	-	0.0	-	0.4	E	0.9	ESE	0.4	E	0.9	ESE	2.2	SSW
23:00-00:00	0.0	-	0.0	-	0.0	-	0.0	-	0.4	ESE	0.4	ESE	0.4	SE
00:00-01:00	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.4	ESE	0.4	N
01:00-02:00	0.0	-	0.0	-	0.0	-	0.0	-	0.9	E	0.0	-	0.0	-
02:00-03:00	0.0	-	0.0	-	0.4	NE	0.0	-	0.9	ESE	0.4	ESE	0.0	-
03:00-04:00	0.0	-	0.0	-	0.0	-	0.0	-	0.4	ESE	0.9	NW	0.0	-
04:00-05:00	0.0	-	0.0	-	0.9	SE	0.0	-	0.0	-	0.9	NNE	0.0	-
05:00-06:00	0.0	-	0.4	NNW	0.9	S	0.0	-	0.4	SW	0.4	NNE	0.0	-
06:00-07:00	0.0	-	0.0	-	0.4	E	0.4	ESE	0.4	N	0.0	-	0.0	-
07:00-08:00	0.0	-	0.4	N	0.0	-	0.0	-	0.4	NNE	0.0	-	0.0	-
08:00-09:00	0.4	SSW	0.4	W	0.9	E	1.3	ESE	0.4	E	0.9	E	0.0	-



Wind Speed & Wind Direction

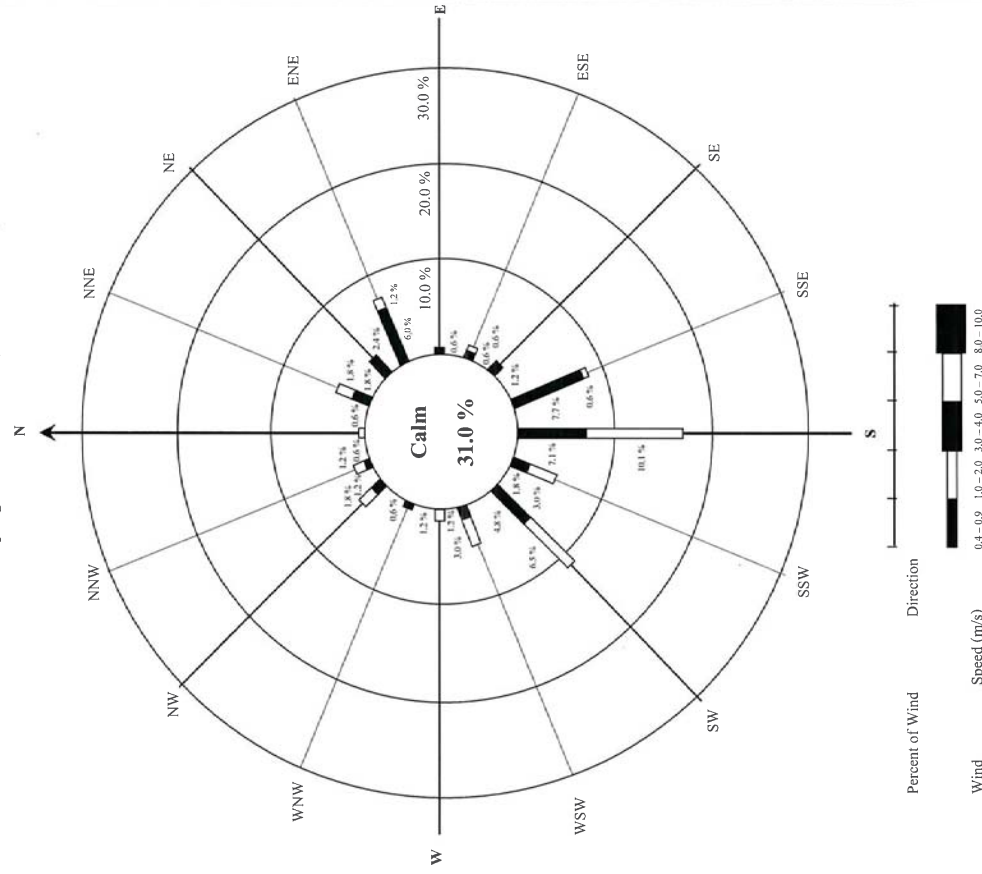
Ratch Pathana Energy Public Company Limited

Sampling Source : บ้านห้วยเล็ก

Sampling Date : October 1-8, 2025

Request No. LA68-R1087

Sample No. 40741



Request No. LA68-R1087

Sample No. 40741

Wind Speed & Wind Direction

Ratch Pathana Energy Public Company Limited

Sampling Source : บ้านห้วยถั่ว

Sampling Date : October 1-8, 2025

Time	October 1-2, 2025		October 2-3, 2025		October 3-4, 2025		October 4-5, 2025		October 5-6, 2025		October 6-7, 2025		October 7-8, 2025	
	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction
10:00-11:00	0.0	-	1.3	NNE	0.9	NE	1.8	SW	2.2	SW	1.3	SW	1.8	SSW
11:00-12:00	0.9	SSE	1.3	NNE	1.3	N	1.3	S	1.8	SSW	2.2	SW	1.8	SW
12:00-13:00	1.8	S	1.3	NNW	1.3	ESE	1.8	SSW	0.9	S	1.8	SW	1.8	S
13:00-14:00	1.3	SSW	1.8	NW	0.9	ENE	1.3	S	0.9	ENE	2.2	SW	1.8	W
14:00-15:00	1.3	S	1.8	NW	1.3	ENE	0.9	S	1.3	S	1.8	W	1.3	SW
15:00-16:00	1.3	SSW	0.9	NW	1.3	NNE	1.8	S	1.3	WSW	0.9	SW		
16:00-17:00	1.8	SW	1.3	WSW	0.9	NNE	1.3	NW	2.2	S	1.3	WSW	0.9	S
17:00-18:00	1.3	SW	1.8	S	0.4	NNW	0.9	WNW	1.8	S	1.3	S	1.3	S
18:00-19:00	1.3	SW	1.3	ENE	0.4	SW	0.9	NW	1.8	S	1.3	S	1.3	SSE
19:00-20:00	0.4	SW	0.4	E	0.0	-	0.4	WSW	1.3	S	0.9	S	0.4	SSE
20:00-21:00	0.4	SW	0.0	-	0.0	-	0.0	-	0.9	S	0.4	S	0.4	SSE
21:00-22:00	0.4	SW	0.0	-	0.4	SSE	0.4	S	0.0	-	0.9	S	0.9	SSW
22:00-23:00	0.0	-	0.0	-	0.4	SSW	0.4	S	0.0	-	0.4	SSE	1.3	WSW
23:00-00:00	0.0	-	0.0	-	0.0	-	0.0	-	0.4	SSE	0.4	SSE	0.4	SSW
00:00-01:00	0.0	-	0.0	-	0.4	SW	0.0	-	0.0	-	0.4	S	0.4	SSE
01:00-02:00	0.0	-	0.0	-	0.0	-	0.0	-	0.4	SSE	0.4	SE	0.4	ENE
02:00-03:00	0.0	-	0.0	-	0.4	SE	0.0	-	0.4	SSE	0.4	SSE	0.4	ENE
03:00-04:00	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.9	NE	0.4	ENE
04:00-05:00	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.4	ENE	0.4	ENE
05:00-06:00	0.0	-	0.4	ENE	0.4	WSW	0.0	-	0.0	-	0.4	NE	0.0	-
06:00-07:00	0.0	-	0.4	ESE	0.0	-	0.4	SSE	0.4	ENE	0.0	-	0.0	-
07:00-08:00	0.0	-	0.0	-	0.0	-	0.0	-	0.4	NE	0.0	-	0.0	-
08:00-09:00	0.0	-	0.4	NNE	0.4	SW	0.9	S	0.4	SSE	0.4	S	0.0	-
09:00-10:00	0.9	NNE	0.4	ENE	1.3	WSW	2.2	S	0.0	-	1.8	S	0.0	-

Request No. LA68-R1087

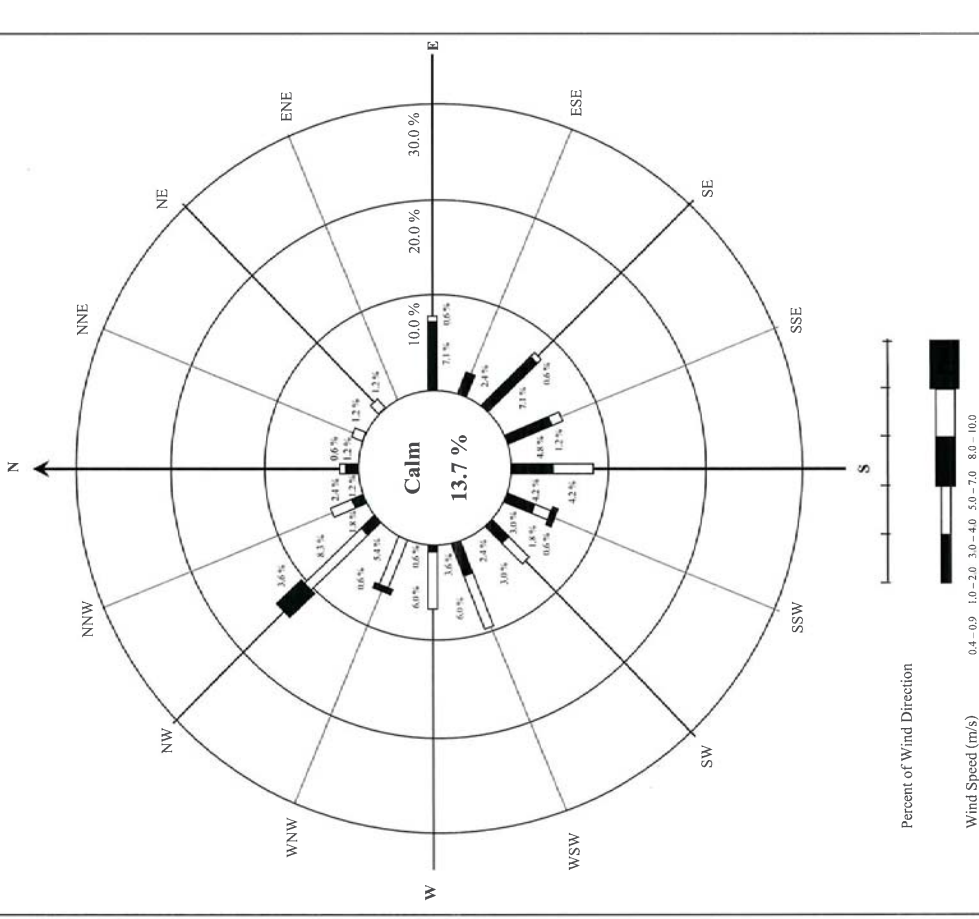
Sample No. 40740

Wind Speed & Wind Direction

Ratch Pathana Energy Public Company Limited

Sampling Source : บ้านหนองจาม

Sampling Date : October 1-8, 2025





Request No. LA68-R1087

Wind Speed & Wind Direction

Sample No. 40740

Ratch Pathana Energy Public Company Limited

Sampling Source : ขุมหินบ้านหนองจาน

Sampling Date : October 1-8, 2025

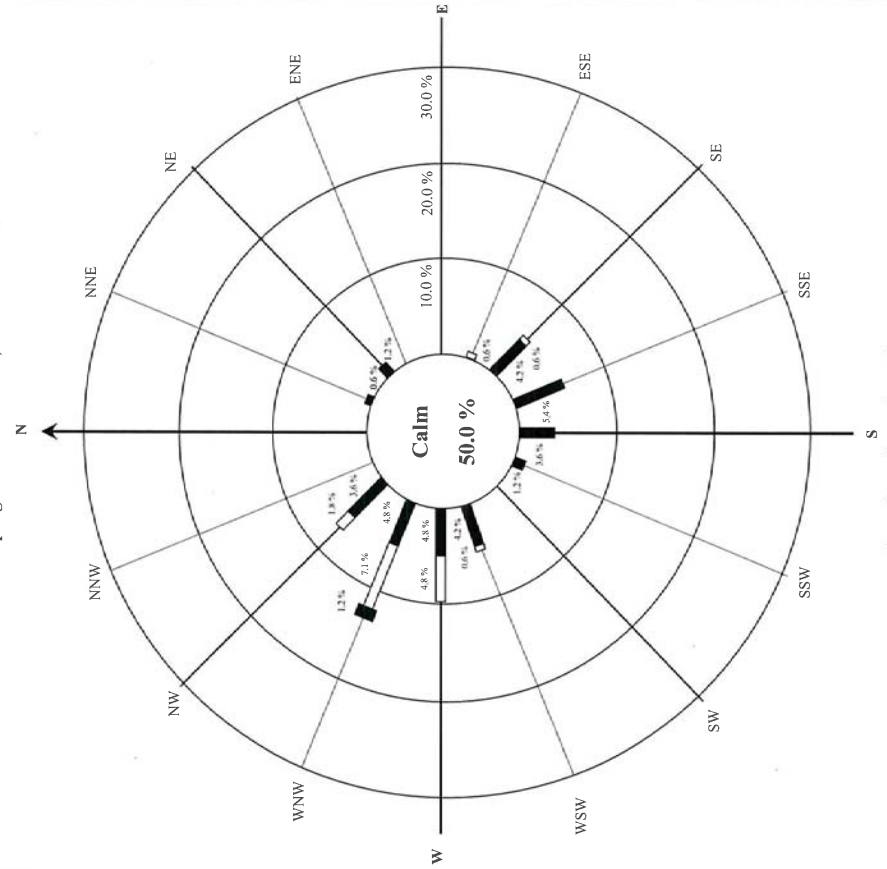
Time	October 1-2, 2025		October 2-3, 2025		October 3-4, 2025		October 4-5, 2025		October 5-6, 2025		October 6-7, 2025		October 7-8, 2025	
	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction
11:00-12:00	0.4	WSW	1.8	WNW	1.8	NW	1.3	S	2.2	WNW	2.7	NW	2.2	NNW
12:00-13:00	1.3	SW	1.8	NW	1.3	NE	2.2	S	1.3	W	2.7	NW	2.2	NW
13:00-14:00	1.8	SE	3.1	NW	0.9	NNW	1.8	WSW	0.9	E	2.7	NW	2.2	WNW
14:00-15:00	1.3	SSE	2.7	NW	1.8	NW	0.9	NW	1.3	W	2.7	NW	2.2	NNE
15:00-16:00	1.3	SSE	1.8	NW	1.8	NW	1.8	NW	2.2	W	2.2	N	1.8	NW
16:00-17:00	2.2	S	2.2	W	1.8	NW	2.2	NNW	2.2	WSW	1.3	WNW	1.3	NW
17:00-18:00	2.2	S	2.7	SSW	1.3	WNW	1.3	NNW	1.8	WSW	1.3	NW	1.3	WSW
18:00-19:00	2.2	SSW	1.3	E	0.4	SSE	1.8	NNW	1.3	WSW	1.3	W	1.3	SW
19:00-20:00	1.8	SW	0.4	SE	0.4	SW	1.3	NW	1.8	WSW	1.3	W	1.3	W
20:00-21:00	1.3	SSW	0.4	S	0.4	SSW	0.9	NW	1.3	SW	1.3	W	1.3	W
21:00-22:00	1.3	SSW	0.4	SE	0.9	SE	0.9	SW	0.4	SSW	1.8	WSW	1.8	WNW
22:00-23:00	0.9	SE	0.4	E	0.9	SE	0.9	SSW	0.4	SW	1.3	WSW	2.2	NNE
23:00-00:00	0.4	SE	0.0	*	0.4	ESE	0.4	SSW	0.4	WSW	1.3	W	0.4	NW
00:00-01:00	0.9	E	0.4	E	0.4	SE	0.4	SE	0.9	WSW	1.3	WSW	0.4	S
01:00-02:00	0.4	E	0.0	*	0.4	SE	0.4	S	0.9	SSW	0.9	WSW	0.0	*
02:00-03:00	0.4	E	0.4	E	0.9	ESE	0.0	*	1.3	WSW	0.9	WSW	0.4	S
03:00-04:00	0.0	*	0.4	E	0.9	ESE	0.4	SSE	0.4	W	1.3	NE	0.0	*
04:00-05:00	0.0	*	0.4	ESE	1.3	S	0.0	*	0.0	*	0.9	SSE	0.0	*
05:00-06:00	0.0	*	0.4	E	0.9	SW	0.0	*	0.4	SE	0.4	SSE	0.0	*
06:00-07:00	0.0	*	0.4	SSE	0.4	E	0.0	*	0.4	SSE	0.0	*	0.0	*
07:00-08:00	0.0	*	0.4	SSE	0.4	E	0.0	*	0.4	SE	0.0	*	0.0	*
08:00-09:00	0.9	N	0.4	WSW	0.9	SE	0.9	S	0.9	SSE	0.9	S	0.0	*
09:00-10:00	1.3	WNW	0.9	NNW	1.3	S	2.2	SW	0.4	S	1.8	WNW	0.4	E
10:00-11:00	1.8	WNW	0.9	N	2.2	S	3.1	WNW	1.8	NW	2.2	NW	0.0	*

Wind Speed & Wind Direction

Ratch Pathana Energy Public Company Limited

Sampling Source : โรงเรียนอนุบาลนครราชสีมา

Sampling Date : October 1-8, 2025



Percent of Wind

Direction

Wind

Speed (m/s)



Request No : LA68-R1087

Sample No. 40743

Wind Speed & Wind Direction

Ratch Pathana Energy Public Company Limited

Sampling Source : โรงเขียนพลังงานถ่านหิน

Sampling Date : October 1-8, 2025

Time	October 1-2, 2025		October 3-4, 2025		October 4-5, 2025		October 5-6, 2025		October 6-7, 2025		October 7-8, 2025	
	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction	Wind Speed (m/s)	Wind Direction
12:00-13:00	2.2	W	1.3	WNW	0.9	NE	0.9	WSW	0.0	*	2.2	W
13:00-14:00	0.9	W	2.2	WNW	0.4	NNE	0.9	W	0.0	*	2.2	WNW
14:00-15:00	0.4	SE	2.2	WNW	0.9	NW	0.4	WNW	0.4	SSE	2.7	WNW
15:00-16:00	0.9	WSW	1.3	WNW	0.9	NW	1.3	NW	0.4	SSE	2.2	WNW
16:00-17:00	0.9	WSW	1.8	W	1.3	WNW	1.3	NW	0.9	SSE	1.3	WNW
17:00-18:00	1.3	WSW	1.8	SE	0.9	WNW	0.9	WNW	0.4	SSE	0.4	WSW
18:00-19:00	1.3	W	1.3	ESE	0.0	*	1.3	WNW	0.4	SE	0.4	SSW
19:00-20:00	0.9	W	0.4	SE	0.0	*	0.9	WNW	0.4	SSE	0.4	WSW
20:00-21:00	0.4	W	0.0	*	0.0	*	0.0	*	0.4	SSE	0.0	*
21:00-22:00	0.0	*	0.0	*	0.4	SE	0.4	W	0.0	*	0.4	S
22:00-23:00	0.0	-	0.0	-	0.0	-	0.0	*	0.4	S	0.4	WNW
23:00-00:00	0.0	*	0.0	*	0.0	*	0.0	*	0.4	S	0.4	WNW
00:00-01:00	0.0	*	0.0	*	0.0	*	0.4	SSE	0.0	*	0.0	*
01:00-02:00	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*
02:00-03:00	0.0	*	0.4	SE	0.0	SE	0.0	*	0.0	*	0.0	*
03:00-04:00	0.0	-	0.0	-	0.0	-	0.0	*	0.4	NW	0.0	*
04:00-05:00	0.0	*	0.0	*	0.0	*	0.0	*	0.9	SE	0.0	*
05:00-06:00	0.0	*	0.4	WNW	0.0	*	0.0	*	0.4	SSE	0.0	*
06:00-07:00	0.0	-	0.0	-	0.0	*	0.4	SE	0.0	*	0.0	*
07:00-08:00	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*
08:00-09:00	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*	0.0	*
09:00-10:00	0.4	NE	0.0	*	0.4	W	0.0	*	0.9	W	0.0	*
10:00-11:00	0.9	WNW	0.0	*	0.4	SSE	2.2	W	1.3	WNW	0.4	NW
11:00-12:00	0.9	NW	0.4	NW	0.0	*	0.9	WSW	0.9	WNW	0.0	*

Physical Appearance : 1. Sample : yellowish, highly SS

2. Container : Normal [ PE 0.5 L [ 2 Bottle], PE 1.0 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มกราคม 2568 นี้ได้เก็บตัวอย่างน้ำทิ้งจากโรงไฟฟ้าถ่านหิน สบู่เตาถ่านหินศรีราชา


2. # = ISO/IEC 17025:2017 Accredited by DSS, SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

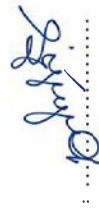
3. Miss Apradee Chuen-arom is Section Head / Miss Nunnaphat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Songpon Phivuan (3-003-9-001.6)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPT Main Wastewater Line : Existing Plant [Project 1 ]

Examined By : 

Approved By : 

(Miss Apradee Chuen-arom)

(Miss Nunnaphat Bakhuntod)

(3-003-9-0007)

(3-003-9-0005)

19/07/2025

19/07/2025


บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

883 หมู่ 11 ถนนพหลโยธิน 8 ถนนพหลโยธิน อ.ศรีราชา จ.ชลบุรี 20230  
Tel: 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
883 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Test Report

Customer : Ratch Pathana Energy Public Company Limited  
Address : 636 Moo 11 Sukhapibam 8 Rd, Nongkham, Sriracha, Chonburi 20230  
Sampling Source : Ratch Pathana Energy Public Company Limited  
Sample Name : Effluent: Existing Plant (Project) /##  
Sampling By : ETC  
Sampling Method : Grab  
Tested Date : 10/07/2025 - 17/07/2025  
Request No : W6807306  
Report No : 6807 - 1362  
Sample No : W 68071111  
Sampling Date : 09/07/2025  
Sampling Time : 3:10 PM  
Received Date : 10/07/2025  
Reported Date : 19/07/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m3/hr.	Calculation	11.25	-

Physical Appearance : 1. Sample: yellowish, lightly SS

2. Container: Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพรฐนอุบลฯนี้ที่ส่งไปขอจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพิมพ์ ซีรี่ยา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]

4. Sampling By Mr. Songpon Phivuan



Examined By : .....  
(Miss Apradee Chuen-arom)  
19/07/2025

REPORTED TEST REFERENCE TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ACCREDITED  
ISO 9001/ISO 14001

EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

Test Report

Customer : Ratch Pathana Energy Public Company Limited\*\*  
Address : 636 Moo 11 Sukhapibam 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*  
Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
Sample Name : Effluent: Existing Plant (Project) /##\*\*  
Sampling By : ETC\*\*  
Sampling Method : Grab\*\*  
Tested Date : 14/08/2025 - 22/08/2025  
Request No : W6808341  
Report No : 6808-1260  
Sample No : W 68081002  
Sampling Date : 13/08/2025\*\*  
Sampling Time : 3:10 PM\*\*  
Received Date : 14/08/2025  
Reported Date : 22/08/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM-4500-Cl G)	< 0.05	≤1
Oil and Grease *	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM-5520B)	< 3.0	<10
pH (on site) *	°C	Electronic Method Laboratory and Field Method (SM-2550 B)	7.9	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM-2550 B)	33	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree celsius (SM-2540C)	900	<3000

Physical Appearance : 1. Sample : lightly SS

2. Container: Normal [ PE 0.5 L (2 Bottle) , PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพรฐนอุบลฯนี้ที่ส่งไปขอจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพิมพ์ ซีรี่ยา

2. # = ISO/IEC 17025:2017 Accredited by DSS, SM - Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apradee Chuen-arom is Section Head / Mr. Kawee Suthasub is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Aocha Khwanimongkhon (T-003-P-0034)\*\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]



Examined By : .....  
(Miss Apradee Chuen-arom)  
(T-003-P-0007)  
22/08/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

## บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิมิต 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.comEASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

## Test Report

Customer : Ratch Pathana Energy Public Company Limited  
Address : 636 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Sampling Source : Ratch Pathana Energy Public Company Limited  
Sample Name : Effluent: Existing Plant [Project 1]##  
Sampling By : ETC  
Sampling Method : Grab  
Tested Date : 14/08/2025 - 22/08/2025Request No : W6808341  
Report No : \*6808-1260

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m3/hr.	Calculation	8.62	-

Physical Appearance : 1. Sample : lightly SS

2. Container: Normal [ PE 0.5 L (2 Bottle) , PE 1.8 L , G 1.0 L ]

Remark : 1./1 ไม่พบฐานข้อมูลก้นบึ้งน้ำทิ้งที่ระบอบอกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องสำอางค์ ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]

4. Sampling By Mr. Aocha Khwasrimongkhon

Examined By : .....  
(Miss Apradee Chuen-arom)  
22/08/2025บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY

ACCREDITED  
ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.comNSC-TIS-17025  
TESTING 1712  
No.0159

## Test Report

Request No : W6809315  
Report No : \*6809-1581Customer : Ratch Pathana Energy Public Company Limited\*\*  
Address : 636 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
Sample Name : Effluent: Existing Plant [Project 1]##\*\*  
Sampling By : ETC\*\*  
Sampling Method : Grab\*\*  
Tested Date : 11/09/2025 - 19/09/2025  
Sample No : W 68091039  
Sampling Date : 10/09/2025\*\*  
Sampling Time : 3:15 PM\*\*  
Received Date : 11/09/2025  
Reported Date : 22/09/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg / L	DPD Colorimetric Method (SM-4500-Cl G)	0.08	≤1
Oil and Grease @	mg / L	Liquid-Liquid, Partition-Gravimetric Method (SM-5520B)	< 3.0	<10
pH (on site) *		Electrometric Method	7.7	5.5-9.0
Temperature *	oC	Laboratory and Field Method (SM-2550 B)	32	<45
Total Dissolved Solids #	mg / L	Dried at 180 degree celcius (SM-2540C)	696	<3000

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container: Normal [ PE 0.5 L (2 Bottle) , PE 1.8 L , G 1.0 L ]

Remark : 1./1 ไม่พบฐานข้อมูลก้นบึ้งน้ำทิ้งที่ระบอบอกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องสำอางค์ ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISL, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apradee Chuen-arom is Section Head / Miss Nunnaphat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Songpon Phiwuan (T-003-P-0016)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]

Examined By : .....  
(Miss Apradee Chuen-arom)  
(T-003-P-0007)  
22/09/2025บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY







## Test Report

Request No : W6810267  
Report No : 6810-1181

Customer : Ratch Pathana Energy Public Company Limited  
Address : 636 Moo 11 Sukhapibam 8 Rd, Nongkham, Sriracha, Chonburi 20230  
Sampling Source : Ratch Pathana Energy Public Company Limited  
Sample Name : Effluent: Existing Plant [Project 1]##  
Sampling By : ETC  
Sampling Time : 3:00 PM  
Received Date : 09/10/2025  
Reported Date : 20/10/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	6.78	-

Physical Appearance : 1. Sample: Wastewater (yellow, lightly SS)

2. Container: Normal [ PE 0.5 L [ 2 Bottle], PE 1.8 L, G 1.0 L ]

Remark : 1./1. มาตรฐานคุณลักษณะที่ระบุไว้ข้างต้นจากโรงงานอุตสาหกรรม สานอุตสาหกรรมศรีราชาพัฒนา ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]

4. Sampling By Mr. Supharek Phutklang

Examined By : .....  
(Miss Apradee Chuen-arom)  
20/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORYACCREDITED  
ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.comTESTING  
NSC-TIS-TIS 17025  
TESTING 1712  
No.0159

## Test Report

Request No : W6811339  
Report No : 6811-1469

Customer : Ratch Pathana Energy Public Company Limited\*\*  
Address : 636 Moo 11 Sukhapibam 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*  
Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
Sample Name : Effluent: Existing Plant [Project 1]##\*\*  
Sampling By : ETC\*\*  
Sampling Time : 3:10 PM\*\*  
Received Date : 13/11/2025  
Reported Date : 22/11/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM:4500-Cl G)	0.05	≤1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM:5520B)	<3.0	<10
pH (on site) *		Electrometric Method	8.0	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM:2550 B)	30	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree Celsius (SM:2540C)	640	<3000

Physical Appearance : 1. Sample: Wastewater (yellowish, lightly SS)

2. Container: Normal [ PE 0.5 L [ 2 Bottle], PE 1.0 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1. มาตรฐานคุณลักษณะที่ระบุไว้ข้างต้นจากโรงงานอุตสาหกรรม สานอุตสาหกรรมศรีราชาพัฒนา ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISI, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Jiraporn Pankong is Section Head / Mr. Kawee Sutthasub is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Aocha Khwansirirongkhon (?-003-?-0034)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line- Existing Plant [Project 1 ]

Examined By : .....  
(Miss Jiraporn Pankong)  
(?-003-?-0009)  
22/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

883 หมู่ 11 อ.สุภาพงษ์ 8 ต.นวมขจรน อ.ศรีราชา จ.ชลบุรี 20230  
 โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2035  
 เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 883 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2035  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



ISO 9001/ISO 14001

EASTERN THAI CONSULTING 1992 CO., LTD.  
 883 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com



TESTING 1712  
 NSC-TIS-17025  
 No.0159

Test Report

Request No : W6811339  
 Report No : 6811-1469

Customer : Ratch Pathana Energy Public Company Limited  
 Address : 636 Moo 11 Sukhapham 8 Rd, Nongkham, Sriracha, Chonburi 20230  
 Sampling Source : Ratch Pathana Energy Public Company Limited  
 Sample Name : Effluent: Existing Plant [Project 1]##  
 Sampling By : ETC  
 Sampling Method : Grab  
 Tested Date : 13/11/2025 - 21/11/2025  
 Sample No : W 68111064  
 Sampling Date : 12/11/2025  
 Sampling Time : 3:10 PM  
 Received Date : 13/11/2025  
 Reported Date : 22/11/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	13.25	-

Test Report

Request No : W6812260  
 Report No : 6812-1295

Customer : Ratch Pathana Energy Public Company Limited\*\*  
 Address : 636 Moo 11 Sukhapham 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*  
 Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
 Sample Name : Effluent: Existing Plant [Project 1]##\*\*  
 Sampling By : ETC\*\*  
 Sampling Method : Grab\*\*  
 Tested Date : 10/12/2025 - 18/12/2025  
 Sample No : W 68120823  
 Sampling Date : 09/12/2025\*\*  
 Sampling Time : 3:20 PM\*\*  
 Received Date : 10/12/2025  
 Reported Date : 19/12/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM4500-Cl G)	< 0.05	≤ 1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM5520B)	< 3.0	< 10
pH (on site) *		Electrometric Method	7.8	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM2550 B)	31	< 45
Total Dissolved Solids #	mg/L	Dried at 180 degree Celsius (SM2540C)	916	< 1000

Physical Appearance : 1. Sample : Wastewater (yellowish, lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพรฐนคุณลักษณะน้ำทิ้งที่ระบายออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมศรีราชาพัฒนา ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1]

4. Sampling By Mr. Aocha Khwansirirongkhon



Examined By : (Miss Jiraporn Pankong)  
 22/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
 REPORTED TEST REFERS TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.0 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพรฐนคุณลักษณะน้ำทิ้งที่ระบายออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมศรีราชาพัฒนา ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TIS, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apiradee Chuen-arom is Section Head / Miss Nunnaphat Bakkhantod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Miss Pompinan Viriyakitsolkul (7-003-P-0030)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line - Existing Plant [Project 1]



Examined By : (Miss Apiradee Chuen-arom)  
 (7-003-P-0007)  
 19/12/2025



Approved By : (Miss Nunnaphat Bakkhantod)  
 (7-003-P-0005)  
 19/12/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
 REPORTED TEST REFERS TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุภาพงษ์ 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com อี-เมล : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapbarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Test Report

Customer : Ratch Pathana Energy Public Company Limited

Address : 636 Moo 11 Sukhapbarn 8 Rd, Nongkham, Sriracha, Chonburi 20230

Sampling Source : Ratch Pathana Energy Public Company Limited

Sample Name : Effluent : Existing Plant [Project 1]##

Sampling By : ETC

Sampling Method : Grab

Tested Date : 10/12/2025 - 18/12/2025

Reported Date : 19/12/2025

Request No : W6812260

Report No : 6812 - 1295

Sample No : W 68120823

Sampling Date : 09/12/2025

Sampling Time : 3:20 PM

Received Date : 10/12/2025

Reported Date : 19/12/2025

Parameter

Unit

Method

Result

Standard<sup>1)</sup>

Flow Rate

m<sup>3</sup>/hr.

Calculation

12.70

\*

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle], PE 1.8 L, G 1.0 L ]

Remark : 1./1 ไม่ตรวจพบกลิ่นและน้ำที่ทิ้งจะบดออกจาโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพิมพ์ ครัวฯ

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Existing Plant [Project 1 ]

4. Sampling By Miss Porpiman Viriyakusolkul



Examined By : .....

(Miss Apradee Chuen-arom)

19/12/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY



EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapbarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



Test Report

Customer : Ratch Pathana Energy Public Company Limited\*\*

Address : 636 Moo 11 Sukhapbarn 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*

Sampling Source : Ratch Pathana Energy Public Company Limited\*\*

Sample Name : Effluent : Expansion Plant [Project 2]###

Sampling By : ETC\*\*

Sampling Method : Grab\*\*

Tested Date : 10/07/2025 - 18/07/2025

Reported Date : 19/07/2025

Request No : W6807306

Report No : 6807-1363

Sample No : W 68071112

Sampling Date : 09/07/2025\*\*

Sampling Time : 3:20 PM\*\*

Received Date : 10/07/2025

Reported Date : 19/07/2025

Parameter

Unit

Method

Result

Standard<sup>1)</sup>

Free Chlorine \*

mg /L

DPD Colorimetric Method

< 0.05

≤1

Oil and Grease \*

mg /L

Liquid-Liquid,

Partition-Gravimetric Method

< 3.0

<10

pH (on site) \*

oC

Electrometric Method

7.1

5.5-9.0

Temperature \*

oC

Laboratory and Field Method

32

<45

Total Dissolved Solids #

mg /L

Dried at 180 degree celsius

1,548

<3000

(SM:2540C)

Physical Appearance : 1. Sample : yellowish, lightly SS

2. Container : Normal [ PE 0.5 L [ 2 Bottle], PE 1.0 L [ 2 Bottle], PE 1.8 L, G 1.0 L ]

Remark : 1./1 ไม่ตรวจพบกลิ่นและน้ำที่ทิ้งจะบดออกจาโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพิมพ์ ครัวฯ

2. # = ISO/IEC 17025:2017 Accredited by DSS, SM = Standard Methods for the Examination of Water and Wastewater,

APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apradee Chuen-arom is Section Head / Miss Nunnaphat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Songpon Phiwuan (2-003-#-001.0)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2 ]

Examined By : .....



Examined By : .....

(Miss Apradee Chuen-arom)

19/07/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY

Examined By : .....



Examined By : .....

(Miss Nunnaphat Bakhuntod)

19/07/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY

# บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุภาพงษ์ 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
 โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
 เว็บไซต์ : http://www.etc1992.com อีเมล : info@etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com

## Test Report

Customer : Ratch Pathana Energy Public Company Limited  
 Address : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Sampling Source : Ratch Pathana Energy Public Company Limited  
 Sample Name : Effluent: Expansion Plant [Project 2]##  
 Sampling By : ETC  
 Sampling Time : 09/07/2025  
 Sampling Date : 3:20 PM  
 Sampling Method : Grab  
 Received Date : 10/07/2025  
 Tested Date : 10/07/2025 - 18/07/2025  
 Reported Date : 19/07/2025

Request No : W6807306  
 Report No : 6807-1363

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	14.59	-

Physical Appearance : 1. Sample: yellowish, lightly SS

2. Container: Normal [ PE 0.5 L [ 2 Bottle], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มหานครอุบลราชธานี น้ำทิ้งที่ระบอบจากโรงงานอุตสาหกรรม สวนอุตสาหกรรมศรีราชา ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

4. Sampling By Mr. Songpon Phiwuan



Examined By : .....  
 (Miss Apradee Chuen-arom)  
 19/07/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



ACCREDITED  
 ISO 9001 / ISO 14001

# EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : matkeing@etc1992.com

## Test Report

Customer : Ratch Pathana Energy Public Company Limited\*\*  
 Address : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
 Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
 Sample Name : Effluent: Expansion Plant [Project 2]##\*\*  
 Sampling By : ETC\*\*  
 Sampling Time : 3:20 PM\*\*  
 Sampling Date : 14/08/2025  
 Sampling Method : Grab\*\*  
 Received Date : 22/08/2025  
 Tested Date : 14/08/2025 - 22/08/2025  
 Reported Date : 22/08/2025

Request No : W6808341  
 Report No : 6808-1261

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM4500-Cl G)	< 0.05	≤1
Oil and Grease *	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM5520B)	< 3.0	<10
pH (on site) *		Electrometric Method	7.5	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM2550 B)	31	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree celsius (SM2540C)	800	<3000

Physical Appearance : 1. Sample : lightly SS

2. Container: Normal [ PE 0.5 L (2 Bottle), PE 1.8 L, G 1.0 L ]

Remark : 1./1 มหานครอุบลราชธานี น้ำทิ้งที่ระบอบจากโรงงานอุตสาหกรรม สวนอุตสาหกรรมศรีราชา ศรีราชา

2. # = ISO/IEC 17025:2017 Accredited by DSS, SM - Standard Methods for the Examination of Water and Wastewater,

APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apradee Chuen-arom is Section Head / Mr. Kawee Sutthasub is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Aocha Khwasimongkhon (T-003-P-0034)\*\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]



Examined By : .....  
 (Miss Apradee Chuen-arom)  
 (T-003-P-0007)  
 22/08/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด  
883 หมู่ 11 ถนนพหลโยธิน อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

## Test Report

Request No : W6808341  
Report No : 6808-1261

Customer : Ratch Pathana Energy Public Company Limited  
Address : 636 Moo 11 Sukhaphibam 8 Rd, Nongkham, Sriracha, Chonburi 20230  
Sampling Source : Ratch Pathana Energy Public Company Limited  
Sample Name : Effluent: Expansion Plant [Project 2]##  
Sampling By : ETC  
Sampling Time : 14/08/2025  
Received Date : 14/08/2025  
Reported Date : 22/08/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	13.90	-

Physical Appearance : 1. Sample : lightly SS

2. Container: Normal [ PE 0.5 L (2 Bottle), PE 1.8 L, G 1.0 L ]

Remark : 1./1 มหกรรมคุณลักษณะที่พึงประสงค์จากโรงงานอุตสาหกรรม สาขาสถาปัตยกรรมศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPT Main Wastewater Line : Expansion Plant [Project 2 ]

4. Sampling By Mr. Aocha Khwansirirongkorn



Examined By : .....  
(Miss Apradee Chuen-arom)  
22/08/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

## Test Report

Request No : W6809315  
Report No : 6809-1582

Customer : Ratch Pathana Energy Public Company Limited\*\*  
Address : 636 Moo 11 Sukhaphibam 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*  
Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
Sample Name : Effluent: Expansion Plant [Project 2]##\*\*  
Sampling By : ETC\*\*  
Sampling Time : 10/09/2025  
Received Date : 11/09/2025  
Reported Date : 22/09/2025

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
-----------	------	--------	--------	------------------------

Free Chlorine *	mg/L	DPD Colorimetric Method (SM-4500-Cl G)	< 0.05	≤1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM-5520B)	< 3.0	<10
pH (on site) *		Electrometric Method	7.4	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM-2550 B)	31	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree celsius (SM-2540C)	684	<3000

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container: Normal [ PE 0.5 L (2 Bottle), PE 1.8 L, G 1.0 L ]

Remark : 1./1 มหกรรมคุณลักษณะที่พึงประสงค์จากโรงงานอุตสาหกรรม สาขาสถาปัตยกรรมศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISL, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023,

3. Miss Apradee Chuen-arom is Section Head / Miss Nannapat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Songpon Phiwuan (7-003-P-0016)\*

5. \*\* = These data are non laboratory data

6. ## Effluent Connection Point to The SPT Main Wastewater Line : Expansion Plant [Project 2 ]

Examined By : .....  
(Miss Apradee Chuen-arom)  
(7-003-P-0007)  
22/09/2025



Approved By : .....  
(Miss Nannapat Bakhuntod)  
(7-003-P-0005)  
22/09/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





ISO 9001 / ISO 14001

## Test Report

Request No : W6809315  
Report No : 6809 - 1582

Customer : Ratch Pathana Energy Public Company Limited  
Address : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Sampling Source : Ratch Pathana Energy Public Company Limited  
Sample Name : Effluent : Expansion Plant [Project 2]##  
Sampling Date : 10/09/2025  
Sampling Time : 3:25 PM  
Received Date : 11/09/2025  
Sampling Method : Grab  
Tested Date : 11/09/2025 - 19/09/2025  
Reported Date : 22/09/2025

Parameter	Unit	Method	Result	Standard <sup>1/</sup>
Flow Rate	m <sup>3</sup> / hr.	Calculation	11.87	-

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container : Normal [ PE 0.5 L (2 Bottle), PE 1.8 L, G 1.0 L ]

Remark : 1./1 มาตรวจคุณภาพน้ำทิ้งที่ระบบออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมคือสหพัฒน์ ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

4. Sampling By Mr. Songpon Phiwuan

Examined By : .....  
(Miss Apiradee Chuen-arom)  
22/09/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY



ISO 9001 / ISO 14001

## Test Report

Request No : W6810267  
Report No : 6810 - 1182

Customer : Ratch Pathana Energy Public Company Limited\*\*  
Address : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
Sample Name : Effluent : Expansion Plant [Project 2]##\*\*  
Sampling Date : 08/10/2025\*\*  
Sampling By : ETC\*\*  
Sampling Time : 3:20 PM\*\*  
Received Date : 09/10/2025  
Sampling Method : Grab\*\*  
Tested Date : 09/10/2025 - 17/10/2025  
Reported Date : 20/10/2025

Parameter	Unit	Method	Result	Standard <sup>1/</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM:4500-Cl G)	< 0.05	≤1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM:5520B)	< 3.0	<10
pH (on site) *		Electrometric Method	8.0	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM:2550 B)	31	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree celsius (SM:2540C)	636	<3000

Physical Appearance : 1. Sample : Wastewater (yellow, lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, PE 1.8 L, G 1.0 L ]

Remark : 1./1 มาตรวจคุณภาพน้ำทิ้งที่ระบบออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมคือสหพัฒน์ ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISL, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apiradee Chuen-arom is Section Head / Miss Nunnaphat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Supharet Phakking (3-003-P-0031)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

Examined By : .....  
(Miss Apiradee Chuen-arom)  
20/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.หนองจันทน์ อ.ศรีราชา จ.ชลบุรี 20230  
 โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
 เว็บไซต์ : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 Moo 11 Sukhapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



Test Report

Customer : Ratch Pathana Energy Public Company Limited  
 Address : 636 Moo 11 Sukhapibarn 8 Rd, Nongkham, Sriracha, Chonburi 20230  
 Sampling Source : Ratch Pathana Energy Public Company Limited  
 Sample No : W 68100902  
 Sample Name : Effluent: Expansion Plant [Project 2]##  
 Sampling Date : 08/10/2025  
 Sampling By : ETC  
 Sampling Time : 3:20 PM  
 Sampling Method : Grab  
 Received Date : 09/10/2025  
 Tested Date : 09/10/2025 - 17/10/2025  
 Reported Date : 20/10/2025

Request No : W6810267  
 Report No : 6810-1182

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	14.58	*

Physical Appearance : 1. Sample : Wastewater (yellow, lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มกราคม 2568 นี้ที่ส่งมอบเอกสารจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพัฒนา ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

4. Sampling By Mr. Suphatek Phaklang



Examined By : .....  
 (Miss Apradee Chuen-arom)  
 20/10/2025



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



ISO 9001/ISO 14001

EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



NSC-TISI-TIS 17025  
 TESTING 1712  
 No.0159

Test Report

Customer : Ratch Pathana Energy Public Company Limited\*\*  
 Address : 636 Moo 11 Sukhapibarn 8 Rd, Nongkham, Sriracha, Chonburi 20230\*\*  
 Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
 Sample No : W 68111065  
 Sample Name : Effluent: Expansion Plant [Project 2]##\*\*  
 Sampling Date : 12/11/2025\*\*  
 Sampling By : ETC\*\*  
 Sampling Time : 3:20 PM\*\*  
 Sampling Method : Grab\*\*  
 Received Date : 13/11/2025  
 Tested Date : 13/11/2025 - 21/11/2025  
 Reported Date : 22/11/2025

Request No : W6811339  
 Report No : 6811-1470

Parameter	Unit	Method	Result	Standard <sup>1)</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM:4500-Cl G)	0.07	≤1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM:5520B)	<3.0	<10
pH (on site) *		Electrometric Method	8.1	5.5-9.0
Temperature *	°C	Laboratory and Field Method (SM:2550 B)	30	<45
Total Dissolved Solids #	mg/L	Dried at 180 degree Celsius (SM:2540C)	608	<3000

Physical Appearance : 1. Sample : Wastewater (yellowish, lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.0 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มกราคม 2568 นี้ที่ส่งมอบเอกสารจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพัฒนา ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISI, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Jiraporn Pankong is Section Head / Mr. Kawee Subhasub is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Mr. Aocha Khwansirirongkhon (?-003-R-0034)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line-Expansion Plant [Project 2]



Examined By : .....  
 (Miss Jiraporn Pankong)  
 (?-003-R-0009)  
 22/11/2025



บริษัท อีสเทิร์นไทยคंसัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



## Test Report

Customer : Ratch Pathana Energy Public Company Limited  
 Address : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Srisracha, Chonburi 20230  
 Sampling Source : Ratch Pathana Energy Public Company Limited  
 Sample No : W 6811/065  
 Sample Name : Effluent : Expansion Plant [Project 2]##  
 Sampling Date : 12/11/2025  
 Sampling By : ETC  
 Sampling Time : 3:20 PM  
 Sampling Method : Grab  
 Received Date : 13/11/2025  
 Tested Date : 13/11/2025 - 21/11/2025  
 Reported Date : 22/11/2025

Parameter	Unit	Method	Result	Standard <sup>1/</sup>
Flow Rate	m <sup>3</sup> /hr.	Calculation	12.69	-

## Test Report

Customer : Ratch Pathana Energy Public Company Limited\*\*  
 Address : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Srisracha, Chonburi 20230\*\*  
 Sampling Source : Ratch Pathana Energy Public Company Limited\*\*  
 Sample No : W 68120824  
 Sample Name : Effluent : Expansion Plant [Project 2]###  
 Sampling Date : 09/12/2025\*\*  
 Sampling By : ETC\*\*  
 Sampling Time : 3:30 PM\*\*  
 Sampling Method : Grab\*\*  
 Received Date : 10/12/2025  
 Tested Date : 10/12/2025 - 18/12/2025  
 Reported Date : 19/12/2025

Parameter	Unit	Method	Result	Standard <sup>1/</sup>
Free Chlorine *	mg/L	DPD Colorimetric Method (SM4500-Cl G)	< 0.05	≤ 1
Oil and Grease @	mg/L	Liquid-Liquid, Partition-Gravimetric Method (SM5520B)	< 3.0	< 10
pH (on site) *	oC	Electrometric Method	7.5	5.5-9.0
Temperature *	oC	Laboratory and Field Method (SM2550 B)	30	< 45
Total Dissolved Solids #	mg/L	Dried at 180 degree celsius (SM2540C)	568	< 1000

Physical Appearance : 1. Sample : Wastewater (yellowish, lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพพรฐานคุณลักษณะน้ำทิ้งที่ระบายออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องสำอางค์ ศรีราชา

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

4. Sampling By Mr. Aocha Khwasirimonghon



Examined By : .....  
 (Miss Jiraporn Pankong)  
 22/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY



Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มพพรฐานคุณลักษณะน้ำทิ้งที่ระบายออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องสำอางค์ ศรีราชา

2. @ = ISO/IEC 17025:2017 Accredited by TISI, # = ISO/IEC 17025:2017 Accredited by DSS,

SM = Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th Edition, 2023.

3. Miss Apiradee Chuen-arom is Section Head / Miss Numanplat Bakhuntod is Technical Management.

4. \* = Test Report/Sampling marked Not Accredited, Sampling By Miss Pimpinan Viriyakusolkul (7-003-P-0030)\*

5. \*\* = These data are non laboratory data.

6. ## Effluent Connection Point to The SPI Main Wastewater Line - Expansion Plant [Project 2]



Examined By : .....  
 (Miss Apiradee Chuen-arom)  
 (7-003-P-0007)  
 19/12/2025



Approved By : .....  
 (Miss Numanplat Bakhuntod)  
 (7-003-P-0005)  
 19/12/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY





## Test Report

Customer : Ratch Pathana Energy Public Company Limited

Request No : W6812260

Report No : 6812-1296

Address : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230

Sampling Source : Ratch Pathana Energy Public Company Limited

Sample No : W 68120824

Sample Name : Effluent : Expansion Plant [Project 2]#

Sampling Date : 09/12/2025

Sampling By : ETC

Sampling Time : 3:30 PM

Sampling Method : Grab

Received Date : 10/12/2025

Tested Date : 10/12/2025 - 18/12/2025

Reported Date : 19/12/2025

Parameter	Unit	Method	Result	Standard <sup>1/1</sup>
-----------	------	--------	--------	-------------------------

Flow Rate	m <sup>3</sup> /hr.	Calculation	8.19	-
-----------	---------------------	-------------	------	---

Physical Appearance : 1. Sample : Wastewater (lightly SS)

2. Container : Normal [ PE 0.5 L [ 2 Bottle ], PE 1.8 L, G 1.0 L ]

Remark : 1./1 มกราคม ๒๕๖๙ ได้เก็บตัวอย่างน้ำทิ้งที่ระบบออกจากโรงงานอุตสาหกรรม ส่วนอุตสาหกรรมเครื่องพิมพ์ สีขาว

2. Parameter Outside The Scope of The Registration of Department of Industrial Works

3. ## Effluent Connection Point to The SPI Main Wastewater Line : Expansion Plant [Project 2]

4. Sampling By Miss Pimpin Vinyakusolkul



Examined By : (Miss Apradee Chuen-arom)

19/12/2025

REPORTED TEST RESULTS TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1 of 1

COPY



ISO 9001/ISO 14001

EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

## TEST REPORT

Customer : Ratch Pathana Energy Public Company Limited\*\*

Address : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*

Sample Source : Ratch Pathana Energy Public Company Limited\*\*

Sample Point : 1. ต้นน้ำหลัก\*\*

Parameter\* : L<sub>eq</sub> 1 hr., L<sub>eq</sub> 24 hr., L<sub>max</sub>, L<sub>avg</sub> & L<sub>sp</sub>#

Determination Method : ISO 1996-1:2016#

Instrument : Integrated Sound Level Meter

S/N 01120952 : Class 1

Sample No. : 44946

Measuring Date : 05-06/11/2025

Received Date : 13/11/2025

Reported Date : 17/11/2025

TIME / DATE	05-06/11/2025 (L <sub>eq</sub> )	05-06/11/2025 (L <sub>max</sub> )	UNIT
-------------	-------------------------------------	--------------------------------------	------

10:00 - 11:00 <sup>9</sup>	56.5	77.4	dB(A)
11:00 - 12:00	55.9	78.0	dB(A)
12:00 - 13:00	55.9	76.4	dB(A)
13:00 - 14:00	56.2	75.9	dB(A)
14:00 - 15:00	56.4	77.4	dB(A)
15:00 - 16:00	60.2	84.4	dB(A)
16:00 - 17:00	58.0	82.7	dB(A)
17:00 - 18:00	58.1	75.7	dB(A)
18:00 - 19:00	57.5	73.3	dB(A)
19:00 - 20:00	57.9	74.7	dB(A)
20:00 - 21:00	58.4	82.8	dB(A)
21:00 - 22:00	56.3	76.6	dB(A)
22:00 - 23:00	56.7	74.5	dB(A)
23:00 - 00:00	58.2	83.6	dB(A)
00:00 - 01:00	55.5	82.2	dB(A)
01:00 - 02:00	54.0	79.0	dB(A)
02:00 - 03:00	52.9	78.2	dB(A)
03:00 - 04:00	51.9	73.2	dB(A)
04:00 - 05:00	55.5	75.0	dB(A)
05:00 - 06:00	59.1	82.4	dB(A)
06:00 - 07:00	57.6	83.9	dB(A)
07:00 - 08:00	58.7	81.5	dB(A)
08:00 - 09:00	57.8	82.0	dB(A)
09:00 - 10:00	56.8	76.7	dB(A)
L <sub>eq</sub> 24 hr.	57.1	-	dB(A)
L <sub>sp</sub> #	62.9	-	dB(A)
Maximum	-	84.4	dB(A)
Standard	70 <sup>10</sup>	115 <sup>11,12</sup>	dB(A)

REMARK : \* Test Report Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

1/ Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

2/ Notification of Ministry of the Industry B.E. 2548 (2005)

3/ Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

(Measurement By Mr. Suphakorn Noppomplak)

\*\* These Data are Non Laboratory Data



Approved By : (MRS. WANPEN LIAOCHINDAWAT)

17/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

COPY

FM-LAB-036001-08-47



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1739

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44946  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะทดสอบ ของแหล่งกำเนิด	ระดับเสียง ขณะเปิดเสียง ของแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงพื้น <sup>a</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
05/11/2025	10:00 - 11:00 <sup>c</sup>	56.5	57.8	52.1	*
	11:00 - 12:00	55.9	56.3	52.8	*
	12:00 - 13:00	55.9	68.7	63.3	*
	13:00 - 14:00	56.2	65.8	58.0	*
	14:00 - 15:00	56.4	57.3	51.2	*
	15:00 - 16:00	60.2	57.3	52.1	5.0
	16:00 - 17:00	58.0	56.9	51.5	0.0
	17:00 - 18:00	58.1	59.0	53.2	*
	18:00 - 19:00	57.5	58.5	51.8	*
	19:00 - 20:00	57.9	57.0	51.5	-0.9
06/11/2025	20:00 - 21:00	58.4	52.8	50.8	2.0
	21:00 - 22:00	56.3	56.7	49.0	*
	22:00 - 22:05	56.1	53.9	49.6	5.5
	22:05 - 22:10	56.8	55.1	48.3	6.6
	22:10 - 22:15	55.9	56.7	48.1	*
	22:15 - 22:20	57.3	57.6	49.0	*
	22:20 - 22:25	57.6	53.0	47.4	11.4
	22:25 - 22:30	56.5	56.8	48.1	*
	22:30 - 22:35	55.6	52.7	47.0	8.5
	22:35 - 22:40	54.5	53.0	47.4	4.8
06/11/2025	22:40 - 22:45	58.4	57.0	49.9	5.9
	22:45 - 22:50	56.0	52.5	47.6	8.8
	22:50 - 22:55	58.2	53.1	47.4	12.2
	22:55 - 23:00	55.3	55.3	49.3	*
	23:00 - 23:05	56.9	52.4	47.6	10.4
	23:05 - 23:10	58.0	52.4	48.0	10.0
	23:10 - 23:15	56.7	56.3	49.4	-0.3
	23:15 - 23:20	59.7	60.1	47.5	*
	23:20 - 23:25	57.2	53.3	47.0	10.9
	23:25 - 23:30	52.3	53.9	49.5	*
หมายเหตุ: เสียงรบกวน <sup>a, b, c</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44946  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะทดสอบ ของแหล่งกำเนิด		ระดับเสียง <sup>a</sup> ขณะเปิดเสียง ของแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงพื้น <sup>a</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
05/11/2025	23:30 - 23:35	55.6	52.6	55.6	46.9	8.7
	23:35 - 23:40	63.0	51.1	65.7	46.7	19.0
	23:40 - 23:45	60.9	52.3	63.3	46.4	16.9
	23:45 - 23:50	54.3	53.7	48.4	47.9	0.5
	23:50 - 23:55	57.2	55.7	54.9	47.5	7.4
	23:55 - 00:00	55.9	53.7	54.9	47.3	7.6
	00:00 - 00:05	55.3	52.6	55.0	46.4	8.6
	00:05 - 00:10	54.8	53.6	51.6	46.5	5.1
	00:10 - 00:15	55.5	50.7	56.8	46.1	10.7
	00:15 - 00:20	55.2	55.0	44.7	48.3	-3.6
06/11/2025	00:20 - 00:25	56.8	50.4	58.7	44.8	13.9
	00:25 - 00:30	53.4	53.3	40.0	46.2	-6.2
	00:30 - 00:35	53.7	51.2	53.1	46.4	6.7
	00:35 - 00:40	54.3	53.4	50.0	47.0	3.0
	00:40 - 00:45	53.7	49.8	54.4	44.5	9.9
	00:45 - 00:50	54.8	51.8	54.8	44.5	10.3
	00:50 - 00:55	52.8	51.3	50.5	44.5	6.0
	00:55 - 01:00	60.2	51.2	62.6	43.1	19.5
	01:00 - 01:05	55.9	51.3	57.1	46.2	10.9
	01:05 - 01:10	57.1	50.3	59.1	47.3	11.8
06/11/2025	01:10 - 01:15	53.4	52.9	46.8	47.9	-1.1
	01:15 - 01:20	49.2	53.7	-	46.8	-
	01:20 - 01:25	52.3	51.2	48.8	46.8	2.0
	01:25 - 01:30	58.2	49.6	60.6	47.4	13.2
	01:30 - 01:35	50.5	50.5	-	46.8	-
	01:35 - 01:40	52.1	50.9	48.9	46.8	2.1
	01:40 - 01:45	53.4	49.8	53.9	46.6	7.3
	01:45 - 01:50	53.2	50.7	52.6	46.2	6.4
	01:50 - 01:55	49.7	49.4	40.9	46.2	-5.3
	01:55 - 02:00	51.9	53.3	-	45.2	-
หมายเหตุ: เสียงรบกวน <sup>a, b, c</sup>						10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Siraacha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Siraacha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1739

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siraacha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่หว้า  
PARAMETER\* : ระดับเสียงรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44946  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 0112092 : Class I

วัน/เวลา ของระดับเสียง ขณะวัดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเกิดเสียง ขณะแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ค</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
06/11/2025	02:00 - 02:05	53.0	53.8	44.0	9.8
	02:05 - 02:10	57.8	59.8	46.0	13.8
	02:10 - 02:15	50.5	47.3	46.2	1.1
	02:15 - 02:20	50.1	47.2	45.0	2.2
	02:20 - 02:25	52.9		46.9	*
	02:25 - 02:30	50.6		44.5	*
	02:30 - 02:35	51.3	51.5	45.5	6.0
	02:35 - 02:40	53.2	42.7	45.3	-2.6
	02:40 - 02:45	50.6		47.9	*
	02:45 - 02:50	50.2		47.1	*
	02:50 - 02:55	50.5		46.9	*
	02:55 - 03:00	55.4	56.8	48.0	8.8
	03:00 - 03:05	52.7		49.6	*
	03:05 - 03:10	51.4		48.6	*
	03:10 - 03:15	51.4		48.4	*
	03:15 - 03:20	51.4		50.2	*
	03:20 - 03:25	50.3		48.2	*
	03:25 - 03:30	53.6		47.8	*
	03:30 - 03:35	51.5		48.2	*
	03:35 - 03:40	49.7		50.1	-2.6
	03:40 - 03:45	50.4		50.6	*
	03:45 - 03:50	53.9	45.6	49.7	*
	03:50 - 03:55	52.6		50.0	*
	03:55 - 04:00	51.9		47.9	*
	04:00 - 04:05	60.5	62.9	49.5	13.4
	04:05 - 04:10	55.9		49.2	*
	04:10 - 04:15	52.1		50.5	*
	04:15 - 04:20	51.2		50.2	*
	04:20 - 04:25	52.9	50.6	49.8	0.8
	04:25 - 04:30	50.2		48.5	*
หมายเหตุ: ระดับการรบกวน <sup>ค</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siraacha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่หว้า  
PARAMETER\* : ระดับเสียงรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44946  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 0112092 : Class I

วัน/เวลา ของระดับเสียง ขณะวัดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเกิดเสียง ขณะแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ค</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
06/11/2025	04:30 - 04:35	50.0	*	51.0	*
	04:35 - 04:40	53.4		50.5	*
	04:40 - 04:45	50.2		50.5	*
	04:45 - 04:50	56.1	55.8	50.2	5.6
	04:50 - 04:55	50.8		50.9	*
	04:55 - 05:00	61.3	63.6	50.8	12.8
	05:00 - 05:05	58.9	58.7	51.3	7.4
	05:05 - 05:10	54.7		50.6	*
	05:10 - 05:15	55.9	62.7	50.0	12.7
	05:15 - 05:20	59.2	59.6	51.4	8.2
	05:20 - 05:25	61.5	62.9	51.7	11.2
	05:25 - 05:30	60.8	61.8	50.7	11.1
	05:30 - 05:35	62.5	64.4	50.0	14.4
	05:35 - 05:40	59.6	59.9	51.4	8.5
	05:40 - 05:45	52.5		50.7	*
	05:45 - 05:50	55.2		50.3	1.5
	05:50 - 05:55	54.9		49.9	*
	05:55 - 06:00	57.3		50.6	*
	06:00 - 07:00	57.6		52.9	*
	07:00 - 08:00	58.7		54.7	*
	08:00 - 09:00	57.8	48.9	51.5	-2.6
	09:00 - 10:00	56.8	43.3	51.2	-7.9
หมายเหตุ: ระดับการรบกวน <sup>ค</sup>					10

REMARK :  
<sup>ก</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)  
<sup>ค</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>ด</sup> Start Time  
<sup>ค</sup> Measuring Date and Time : 12-13/11/2025  
<sup>ค</sup> Measurement Follow 'The Announcement of The Pollution Control Board B.E. 2565 (2022) and The Notification of Ministry of the Industry B.E. 2567 (2024)  
\* Parameter Outside The Scope of The Regulation of The Department of Industrial Works (Measurement By Mr. Suphakorn Noppornrak)



Approved By :  
(MRS. WANPEN LIAOCHINDAWAT)  
17/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R1149  
Report No. R6811-1740

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{eq}^{1/3}$  &  $L_{eq}^{1/6}$   
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
S/N 01120952 : Class 1

SAMPLE NO. : 44947  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	06-07/11/2025 ( $L_{eq}$ )	06-07/11/2025 ( $L_{max}$ )	06-07/11/2025 ( $L_{eq}^{1/3}$ )	UNIT
10:00 - 11:00 <sup>9</sup>	58.0	82.4	52.1	dB(A)
11:00 - 12:00	58.9	83.4	52.7	dB(A)
12:00 - 13:00	57.1	80.9	51.8	dB(A)
13:00 - 14:00	60.3	90.7	53.0	dB(A)
14:00 - 15:00	56.6	72.2	52.2	dB(A)
15:00 - 16:00	58.7	76.3	53.0	dB(A)
16:00 - 17:00	58.4	79.0	52.9	dB(A)
17:00 - 18:00	58.3	83.5	53.3	dB(A)
18:00 - 19:00	57.1	73.2	52.4	dB(A)
19:00 - 20:00	57.6	76.2	52.4	dB(A)
20:00 - 21:00	58.0	80.6	52.9	dB(A)
21:00 - 22:00	57.6	79.8	51.7	dB(A)
22:00 - 23:00	56.1	74.3	50.5	dB(A)
23:00 - 00:00	55.0	77.4	48.7	dB(A)
00:00 - 01:00	53.9	78.2	47.8	dB(A)
01:00 - 02:00	51.5	70.3	46.1	dB(A)
02:00 - 03:00	53.7	79.7	46.9	dB(A)
03:00 - 04:00	52.9	79.0	46.9	dB(A)
04:00 - 05:00	51.8	74.1	47.1	dB(A)
05:00 - 06:00	55.0	74.3	48.4	dB(A)
06:00 - 07:00	58.7	81.6	51.4	dB(A)
07:00 - 08:00	59.6	79.4	54.2	dB(A)
08:00 - 09:00	56.9	75.4	51.8	dB(A)
09:00 - 10:00	55.5	75.8	50.5	dB(A)
$L_{eq}$ 24 hr.	57.1	-	-	dB(A)
$L_{eq}^{1/3}$	61.9	-	-	dB(A)
Maximum	90.7	-	-	dB(A)
Standard	70 <sup>1,2,3</sup>	115 <sup>1,2,3</sup>	-	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>1</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>2</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>3</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>4</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Person (Ms. Thanaporn Klinsepon in Section Head, Mrs. Wanpet (Measurement By Mr. Suphachorn Noppornpiak))

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPET LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



FM-LAB-036-001-08-47



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด  
683 หมู่ 11 ถนนพหลโยธิน อ.ศรีราชา จ.ชลบุรี 20230  
โทร: 0-3848-1197, 0-3876-3031-2 แฟกซ์: 0-3848-2095  
เว็บไซต์: http://www.etc1992.com อีเมล: info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1740

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับเสียงรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
S/N 01120952 : Class 1

SAMPLE NO. : 44947  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะวัดเสียง	ระดับเสียง ขณะเปิดเครื่อง ขณะรถวิ่ง $L_{eq}$ (dB(A))	ระดับเสียง ขณะไม่ การรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>1</sup> dB(A)	ระดับเสียงที่จุด <sup>2</sup> $L_{eq}$ (dB(A))	ระดับการรบกวน dB(A)
06/11/2025	10:00 - 11:00 <sup>9</sup>	57.8	44.5	52.1	-7.6
	11:00 - 12:00	56.3	55.4	52.8	2.6
	12:00 - 13:00	57.1	-	63.3	-
	13:00 - 14:00	60.3	-	58.0	-
	14:00 - 15:00	56.6	-	51.2	-
	15:00 - 16:00	57.3	53.1	52.1	1.0
	16:00 - 17:00	58.4	53.1	51.5	1.6
	17:00 - 18:00	58.3	-	53.2	-
	18:00 - 19:00	57.1	-	51.8	-
	19:00 - 20:00	57.6	48.7	51.5	-2.8
	20:00 - 21:00	57.0	51.1	50.8	0.3
	21:00 - 22:00	57.6	50.3	49.0	1.3
	22:00 - 22:05	57.3	57.6	49.6	8.0
	22:05 - 22:10	54.7	-	48.3	-
	22:10 - 22:15	54.2	-	48.1	-
	22:15 - 22:20	57.6	-	49.0	-
	22:20 - 22:25	61.2	63.5	47.4	16.1
	22:25 - 22:30	55.2	-	48.1	-
	22:30 - 22:35	54.7	53.4	47.0	6.4
	22:35 - 22:40	53.4	45.8	47.4	-1.6
	22:40 - 22:45	57.0	-	49.9	-
	22:45 - 22:50	53.6	50.1	47.6	2.5
	22:50 - 22:55	56.1	56.1	47.4	8.7
	22:55 - 23:00	54.8	-	49.3	-
	23:00 - 23:05	53.6	50.4	47.6	2.8
	23:05 - 23:10	54.5	53.3	48.0	5.3
	23:10 - 23:15	55.1	-	49.4	-
	23:15 - 23:20	52.4	-	47.5	-
	23:20 - 23:25	54.1	49.4	47.0	2.4
	23:25 - 23:30	55.1	51.9	49.5	2.4
หมายเหตุ: ระดับเสียงรบกวน <sup>4</sup> dB					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Page 1/4

FM-LAB-224/124-07-66



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com  
ISO/IEC 17025

Request No. LA68-R1149  
Report No. R6811-1740

TEST REPORT

CUSTOMER : Ratch Prathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Prathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ห้วย  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44947  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะวัดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะวัดเสียง ขณะแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงพื้นหลัง <sup>ก</sup> L <sub>np</sub> (dB(A))	ระดับการรบกวน dB(A)
06/11/2025	23:30-23:35	51.8	52.6	46.9	*
	23:35-23:40	54.9	51.1	46.7	8.9
	23:40-23:45	54.0	52.3	46.4	5.7
	23:45-23:50	55.4	53.5	47.9	5.6
	23:50-23:55	59.5	55.7	47.5	12.7
	23:55-00:00	54.4	53.7	47.3	1.8
	00:00-00:05	54.0	52.6	46.4	5.0
	00:05-00:10	52.5	53.6	46.5	*
	00:10-00:15	56.5	50.7	46.1	12.1
	00:15-00:20	54.1	55.0	48.3	*
07/11/2025	00:20-00:25	57.0	50.4	44.8	14.1
	00:25-00:30	51.9	53.3	46.2	*
	00:30-00:35	53.3	51.2	46.4	5.7
	00:35-00:40	51.8	49.8	47.0	*
	00:40-00:45	53.0	53.4	44.5	8.7
	00:45-00:50	51.3	51.8	44.5	6.5
	00:50-00:55	53.9	51.3	44.5	8.9
	00:55-01:00	50.6	51.2	43.1	*
	01:00-01:05	49.9	51.3	46.2	*
	01:05-01:10	53.2	50.3	47.3	5.8
07/11/2025	01:10-01:15	52.5	52.9	47.9	*
	01:15-01:20	50.1	53.7	46.8	*
	01:20-01:25	51.8	51.2	46.8	-0.9
	01:25-01:30	51.1	49.6	47.4	1.4
	01:30-01:35	50.7	50.5	46.8	-6.6
	01:35-01:40	50.5	50.9	46.8	*
	01:40-01:45	53.1	49.8	46.6	6.8
	01:45-01:50	49.3	50.7	46.2	*
	01:50-01:55	51.5	49.4	46.2	4.1
	01:55-02:00	52.7	53.3	45.2	*
มาตรฐานเสียงรบกวน <sup>ก,ก</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com  
ISO/IEC 17025

Request No. LA68-R1149  
Report No. R6811-1740

TEST REPORT

CUSTOMER : Ratch Prathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Prathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ห้วย  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44947  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะวัดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะวัดเสียง ขณะแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงพื้นหลัง <sup>ก</sup> L <sub>np</sub> (dB(A))	ระดับการรบกวน dB(A)
07/11/2025	02:00-02:05	53.0	53.8	44.0	9.8
	02:05-02:10	55.0	55.9	46.0	9.9
	02:10-02:15	53.3	54.1	46.2	7.9
	02:15-02:20	51.8	51.8	45.0	6.8
	02:20-02:25	55.4	54.1	46.9	7.2
	02:25-02:30	55.8	56.7	44.5	12.2
	02:30-02:35	49.7	47.6	45.5	2.1
	02:35-02:40	51.4	*	45.3	*
	02:40-02:45	50.0	*	47.9	*
	02:45-02:50	54.1	54.7	47.1	7.6
07/11/2025	02:50-02:55	51.0	*	46.9	*
	02:55-03:00	57.0	59.0	48.0	11.0
	03:00-03:05	57.5	*	49.6	*
	03:05-03:10	50.3	*	48.6	*
	03:10-03:15	50.4	*	48.4	*
	03:15-03:20	53.7	51.4	50.2	1.2
	03:20-03:25	52.3	48.4	48.2	0.2
	03:25-03:30	53.1	*	47.8	*
	03:30-03:35	54.7	55.4	48.2	7.2
	03:35-03:40	49.7	*	50.1	*
07/11/2025	03:40-03:45	50.7	*	50.6	*
	03:45-03:50	50.6	*	49.7	*
	03:50-03:55	49.8	*	50.0	*
	03:55-04:00	54.1	52.8	47.9	4.9
	04:00-04:05	54.3	54.1	49.5	4.6
	04:05-04:10	51.3	*	49.2	*
	04:10-04:15	50.7	*	50.5	*
	04:15-04:20	48.0	*	50.2	*
	04:20-04:25	50.8	*	49.8	*
	04:25-04:30	52.1	43.3	48.5	-5.2
มาตรฐานเสียงรบกวน <sup>ก,ก</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





# บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

663 หมู่ 11 ต.สุเทพนิคม อ.เมืองราชบุรี จ.ราชบุรี 20230  
โทร: 0-3848-1197, 0-3876-3031-2 แฟกซ์: 0-3848-2095  
เว็บไซต์: http://www.etc1992.com อีเมล: info@etc1992.com

Request No. LA68-R149  
Report No. R6811-1740

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่สุเทพนิคม  
PARAMETER\* : ระดับเสียงรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44947  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะเกิดเสียง ขณะเคลื่อนที่ ของแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>a</sup> dB(A)	ระดับเสียงพื้นหลัง <sup>a</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
07/11/2025					
04:30 - 04:35	51.4	53.4	*	51.0	*
04:35 - 04:40	52.4	53.3	*	50.5	*
04:40 - 04:45	52.2	54.2	*	50.5	*
04:45 - 04:50	52.9	53.4	*	50.2	*
04:50 - 04:55	49.3	58.4	*	50.9	*
04:55 - 05:00	52.6	52.8	*	50.8	*
05:00 - 05:05	52.7	56.1	*	51.3	*
05:05 - 05:10	56.0	55.0	52.1	50.6	1.5
05:10 - 05:15	54.1	55.9	*	50.0	*
05:15 - 05:20	55.2	55.7	*	51.4	*
05:20 - 05:25	52.8	56.4	*	51.7	*
05:25 - 05:30	53.7	56.5	*	50.7	*
05:30 - 05:35	54.0	56.1	*	50.0	*
05:35 - 05:40	57.1	56.3	52.4	51.4	1.0
05:40 - 05:45	55.1	55.7	*	50.7	*
05:45 - 05:50	54.8	55.2	*	50.3	*
05:50 - 05:55	57.1	55.2	55.6	49.9	5.7
05:55 - 06:00	54.7	57.3	*	50.6	*
06:00 - 07:00	58.7	58.3	48.1	52.9	-4.8
07:00 - 08:00	59.6	59.0	50.7	54.7	-4.0
08:00 - 09:00	56.9	57.2	*	51.5	*
09:00 - 10:00	55.5	56.6	*	51.2	*

REMARK : <sup>a</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

<sup>a</sup> Measuring Date and Time : 12-13/11/2025

<sup>a</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022) and The Notification of Ministry of the Industry B.E. 2567 (2024)

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Measurement By Mr. Suphakorn Noppompiak)



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

# EASTERN THAI CONSULTING 1992 CO., LTD.

663 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1741

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : บ้านไร่สุเทพนิคม  
PARAMETER\* : L<sub>eq</sub> 1 hr., L<sub>eq</sub> 24 hr., L<sub>max</sub>, L<sub>avg</sub> & L<sub>eq</sub>#  
DETERMINATION METHOD : ISO 1996-1:2016\*\*  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44948  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	07-08/11/2025 (L <sub>eq</sub> )	07-08/11/2025 (L <sub>max</sub> )	07-08/11/2025 (L <sub>avg</sub> )	UNIT
10:00 - 11:00 <sup>a</sup>	55.9	75.0	51.2	dB(A)
11:00 - 12:00	56.5	78.5	51.9	dB(A)
12:00 - 13:00	56.0	74.8	51.7	dB(A)
13:00 - 14:00	57.2	82.1	52.7	dB(A)
14:00 - 15:00	56.9	81.6	51.9	dB(A)
15:00 - 16:00	58.2	80.6	53.3	dB(A)
16:00 - 17:00	61.3	84.8	52.8	dB(A)
17:00 - 18:00	59.5	89.5	52.9	dB(A)
18:00 - 19:00	57.6	78.6	52.5	dB(A)
19:00 - 20:00	57.9	80.2	52.8	dB(A)
20:00 - 21:00	57.3	74.1	52.1	dB(A)
21:00 - 22:00	56.0	76.1	49.2	dB(A)
22:00 - 23:00	57.4	81.8	49.3	dB(A)
23:00 - 00:00	56.1	81.0	49.1	dB(A)
00:00 - 01:00	53.3	72.6	47.1	dB(A)
01:00 - 02:00	53.1	75.1	45.8	dB(A)
02:00 - 03:00	56.6	85.1	46.7	dB(A)
03:00 - 04:00	53.5	80.5	46.6	dB(A)
04:00 - 05:00	53.4	70.5	46.0	dB(A)
05:00 - 06:00	55.9	78.2	47.6	dB(A)
06:00 - 07:00	56.4	72.1	51.8	dB(A)
07:00 - 08:00	59.4	82.2	54.3	dB(A)
08:00 - 09:00	57.5	82.7	52.0	dB(A)
09:00 - 10:00	55.4	73.2	49.7	dB(A)
L <sub>eq</sub> 24 hr.	57.0	-	-	dB(A)
L <sub>avg</sub> #	62.2	-	-	dB(A)
Maximum	89.5	-	-	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	-	dB(A)

REMARK : <sup>a</sup> Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>a</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Measurement By Mr. Suphakorn Noppompiak)

\*\* These Data are Non Laboratory Data



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphlomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphlomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1741

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphlomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่หญ้า  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44948  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของเครื่องวัด	ระดับเสียง ขณะติดตั้ง ของเครื่องวัด L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ค</sup> L <sub>tot</sub> (dB(A))	ระดับเสียง dB(A)
07/11/2025	10:00 - 11:00 <sup>ข</sup>	57.8	-	52.1	-
	11:00 - 12:00	56.3	43.0	52.8	-9.8
	12:00 - 13:00	56.0	-	63.3	-
	13:00 - 14:00	57.2	65.8	58.0	-
	14:00 - 15:00	56.9	-	51.2	-
	15:00 - 16:00	57.3	50.9	52.1	-1.2
	16:00 - 17:00	61.3	59.3	51.5	7.8
	17:00 - 18:00	59.5	49.9	53.2	-3.3
	18:00 - 19:00	57.6	-	51.8	-
	19:00 - 20:00	57.9	50.6	51.5	-0.9
	20:00 - 21:00	57.3	45.5	50.8	-5.3
	21:00 - 22:00	56.0	-	49.0	-
	22:00 - 22:05	54.3	46.7	49.6	-2.9
	22:05 - 22:10	55.1	55.2	48.3	6.9
	22:10 - 22:15	59.6	59.5	48.1	11.4
	22:15 - 22:20	59.6	58.3	49.0	9.3
	22:20 - 22:25	59.7	61.7	47.4	14.3
	22:25 - 22:30	53.8	-	48.1	-
	22:30 - 22:35	54.8	53.6	47.0	6.6
	22:35 - 22:40	55.8	55.6	47.4	8.2
	22:40 - 22:45	52.1	-	49.9	-
	22:45 - 22:50	55.5	55.5	47.6	7.9
	22:50 - 22:55	59.9	61.9	47.4	14.5
	22:55 - 23:00	58.1	57.9	49.3	8.6
	23:00 - 23:05	55.2	55.0	47.6	7.4
	23:05 - 23:10	52.4	51.6	48.0	3.6
	23:10 - 23:15	51.7	-	49.4	-
	23:15 - 23:20	53.0	-	47.5	-
	23:20 - 23:25	61.7	64.0	47.0	17.0
	23:25 - 23:30	53.9	-	49.5	-
มาตรฐานเสียงรบกวน <sup>ก,ค</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphlomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่หญ้า  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44948  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของเครื่องวัด	ระดับเสียง ขณะติดตั้ง ของเครื่องวัด L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ค</sup> L <sub>tot</sub> (dB(A))	ระดับเสียง dB(A)
07/11/2025	23:30 - 23:35	54.5	52.6	53.0	46.9
	23:35 - 23:40	53.3	51.1	52.3	5.6
	23:40 - 23:45	59.4	52.3	61.5	15.1
	23:45 - 23:50	54.7	53.7	50.8	2.9
	23:50 - 23:55	55.7	55.7	-	-
	23:55 - 00:00	54.1	53.7	46.5	-0.8
	00:00 - 00:05	52.8	52.6	42.3	-4.1
	00:05 - 00:10	51.9	53.6	-	-
	00:10 - 00:15	51.6	50.7	47.3	1.2
	00:15 - 00:20	57.4	55.0	56.7	8.4
	00:20 - 00:25	53.1	50.4	52.8	8.0
	00:25 - 00:30	51.6	53.3	-	-
	00:30 - 00:35	53.3	51.2	52.1	5.7
	00:35 - 00:40	50.9	53.4	-	-
	00:40 - 00:45	53.3	49.8	53.7	9.2
	00:45 - 00:50	54.9	51.8	55.0	10.5
	00:50 - 00:55	52.7	51.3	50.1	5.6
	00:55 - 01:00	51.3	51.2	37.9	-5.2
	01:00 - 01:05	51.1	51.3	-	-
	01:05 - 01:10	52.6	50.3	51.7	4.4
	01:10 - 01:15	52.7	52.9	-	-
	01:15 - 01:20	47.6	53.7	-	-
	01:20 - 01:25	52.3	51.2	48.8	2.0
	01:25 - 01:30	55.9	49.6	57.7	10.3
	01:30 - 01:35	51.5	50.5	47.6	0.8
	01:35 - 01:40	53.2	50.9	52.3	5.5
	01:40 - 01:45	50.5	49.8	45.2	-1.4
	01:45 - 01:50	57.0	50.7	58.8	12.6
	01:50 - 01:55	54.3	49.4	55.6	9.4
	01:55 - 02:00	51.0	53.3	-	-
มาตรฐานเสียงรบกวน <sup>ก,ค</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY







**บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด**  
683 หมู่ 11 ต.สุรางคิบาล 8 ต.นันทวงษา อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

**EASTERN THAI CONSULTING 1992 CO., LTD.**  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1741

**TEST REPORT**

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44948  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ก</sup> L <sub>tot</sub> (dB(A))	ระดับการรบกวน dB(A)
08/11/2025	02:00 - 02:05	50.1	46.6	44.0	2.6
	02:05 - 02:10	54.4	54.9	46.0	8.9
	02:10 - 02:15	50.3	46.4	46.2	0.2
	02:15 - 02:20	64.5	67.4	48.8	22.4
	02:20 - 02:25	50.7	53.4	46.9	*
	02:25 - 02:30	50.5	51.6	44.5	*
	02:30 - 02:35	51.6	52.0	45.5	6.5
	02:35 - 02:40	52.4	53.0	45.3	*
	02:40 - 02:45	51.2	52.1	47.9	*
	02:45 - 02:50	58.5	60.8	47.1	13.7
	02:50 - 02:55	51.9	59.2	46.9	12.3
	02:55 - 03:00	54.5	55.4	48.0	7.4
	03:00 - 03:05	58.7	59.1	49.6	*
	03:05 - 03:10	52.1	52.7	48.6	*
	03:10 - 03:15	51.4	54.4	48.4	*
	03:15 - 03:20	55.0	54.8	50.2	4.6
	03:20 - 03:25	52.8	50.5	48.2	2.3
	03:25 - 03:30	53.9	56.9	47.8	*
	03:30 - 03:35	51.1	50.9	50.1	-7.6
	03:35 - 03:40	47.7	53.5	50.6	*
	03:40 - 03:45	49.1	52.2	49.7	*
	03:45 - 03:50	53.0	55.8	50.0	*
	03:50 - 03:55	50.9	53.1	50.0	*
	03:55 - 04:00	54.5	53.8	47.9	5.9
	04:00 - 04:05	53.2	51.5	49.5	1.8
	04:05 - 04:10	53.1	53.1	49.2	*
	04:10 - 04:15	51.8	53.6	50.5	*
	04:15 - 04:20	50.8	54.2	50.2	*
	04:20 - 04:25	52.3	51.4	49.8	-1.8
	04:25 - 04:30	52.0	41.5	48.5	-7.0
มาตรฐานเสียงรบกวน <sup>ก,ก</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



**บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด**  
683 หมู่ 11 ต.สุรางคิบาล 8 ต.นันทวงษา อ.ศรีราชา จ.ชลบุรี 20230  
Tel. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

**EASTERN THAI CONSULTING 1992 CO., LTD.**  
683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1741

**TEST REPORT**

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44948  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>ก</sup> dB(A)	ระดับเสียงทั้งหมด <sup>ก</sup> L <sub>tot</sub> (dB(A))	ระดับการรบกวน dB(A)
08/11/2025	04:30 - 04:35	53.1	53.4	51.0
	04:35 - 04:40	54.3	53.3	50.5
	04:40 - 04:45	55.2	54.2	50.5
	04:45 - 04:50	52.6	53.4	50.2
	04:50 - 04:55	52.2	58.4	50.9
	04:55 - 05:00	56.5	52.8	50.8
	05:00 - 05:05	51.2	56.1	51.3
	05:05 - 05:10	57.8	55.0	50.6
	05:10 - 05:15	55.5	55.9	50.0
	05:15 - 05:20	56.6	55.7	51.4
	05:20 - 05:25	54.9	56.4	51.7
	05:25 - 05:30	54.9	56.5	50.7
	05:30 - 05:35	55.6	56.1	50.0
	05:35 - 05:40	56.7	56.3	51.4
	05:40 - 05:45	57.4	55.2	50.7
	05:45 - 05:50	56.9	55.0	50.3
	05:50 - 05:55	54.1	55.2	49.9
	05:55 - 06:00	55.1	57.3	50.6
	06:00 - 07:00	56.4	58.3	52.9
	07:00 - 08:00	59.4	59.0	54.7
	08:00 - 09:00	57.5	57.2	51.5
	09:00 - 10:00	55.4	56.6	51.2
มาตรฐานเสียงรบกวน <sup>ก,ก</sup>				10

REMARK :  
<sup>ก</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)  
<sup>ก</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>ก</sup> Start Time  
<sup>ก</sup> Measuring Date and Time : 12-13/11/2025  
<sup>ก</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022) and The Notification of Ministry of the Industry B.E. 2567 (2024)  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Work (Measurement By Mr. Suphakorn Noppornphak)



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel: 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com



ISO 9001 / ISO 14001

Request No. LA68-R1149  
Report No. R6811-1742

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*

SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*

SAMPLE POINT : 1. บ้านไร่พุดชา\*\*  
2.  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$  &  $L_{eq}$  #

PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$  &  $L_{eq}$  #

DETERMINATION METHOD : ISO 1996-1:2016#

INSTRUMENT : Integrated Sound Level Meter

SN 01120952 : Class 1

SAMPLE NO. : 44949  
MEASURING DATE : 08/09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	08-09/11/2025 ( $L_{eq}$ )	08-09/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>g</sup>	55.1	73.3	dB(A)
11:00 - 12:00	56.4	77.2	dB(A)
12:00 - 13:00	59.5	88.3	dB(A)
13:00 - 14:00	56.7	78.4	dB(A)
14:00 - 15:00	56.7	80.9	dB(A)
15:00 - 16:00	57.1	83.0	dB(A)
16:00 - 17:00	57.2	80.1	dB(A)
17:00 - 18:00	58.5	84.2	dB(A)
18:00 - 19:00	58.4	78.2	dB(A)
19:00 - 20:00	57.9	81.4	dB(A)
20:00 - 21:00	58.3	81.3	dB(A)
21:00 - 22:00	57.9	83.1	dB(A)
22:00 - 23:00	56.9	85.6	dB(A)
23:00 - 00:00	55.2	78.0	dB(A)
00:00 - 01:00	56.6	84.3	dB(A)
01:00 - 02:00	54.0	78.3	dB(A)
02:00 - 03:00	54.4	81.1	dB(A)
03:00 - 04:00	52.8	74.6	dB(A)
04:00 - 05:00	53.4	76.8	dB(A)
05:00 - 06:00	55.1	76.4	dB(A)
06:00 - 07:00	56.5	78.9	dB(A)
07:00 - 08:00	57.1	82.0	dB(A)
08:00 - 09:00	57.3	76.7	dB(A)
09:00 - 10:00	57.1	73.9	dB(A)
$L_{eq}$ 24 hr.	56.8	-	dB(A)
$L_{eq}$ #	62.0	-	dB(A)
Maximum	-	88.3	dB(A)
Standard	70 <sup>h,i,j</sup>	115 <sup>k,l</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>h</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>i</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>j</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thasaporn Klinsepon is Section Head, Mrs. Wanpen Limsa-ang is Deputy Section Head, Measurement By Mr. Suphakorn Noppornplak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANNEN LIAOCHINDAWAT)  
17/11/2025



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุขาภิบาล 8 ต.นongkham อ.ศรีราชา จ.ชลบุรี 20230  
โทร: 0-3848-1197, 0-3876-3031-2 แฟกซ์: 0-3848-2095  
เว็บไซต์: http://www.etc1992.com อีเมล: info@etc1992.com E-mail: info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1742

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited

ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230

SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited

SAMPLE POINT : บ้านไร่พุดชา

PARAMETER\* : ระดับเสียงรบกวน

DETERMINATION METHOD : ISO 1996-1:2016

INSTRUMENT : Integrated Sound Level Meter

SN 01120952 : Class 1

SAMPLE NO. : 44949  
MEASURING DATE : 08-09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด $L_{eq}$ (dB(A))	ระดับเสียง ขณะไม่ มีการรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะ มี $L_{eq}$ (dB(A)) <sup>h</sup>	ระดับการรบกวน dB(A)
08/11/2025	55.1	57.8	55.1	52.1	-
10:00 - 11:00 <sup>g</sup>	56.4	56.3	40.0	52.8	-12.8
11:00 - 12:00	59.5	68.7	-	63.3	-
12:00 - 13:00	56.7	65.8	-	58.0	-
13:00 - 14:00	56.7	57.3	-	51.2	-
14:00 - 15:00	57.1	57.3	-	52.1	-
15:00 - 16:00	57.2	56.9	46.4	51.5	-6.1
16:00 - 17:00	58.5	59.0	-	53.2	-
17:00 - 18:00	58.4	58.5	-	51.8	-
18:00 - 19:00	57.9	57.0	50.6	51.5	-0.9
19:00 - 20:00	58.3	57.0	52.4	50.8	1.6
20:00 - 21:00	57.9	56.7	51.7	49.0	2.7
21:00 - 22:00	57.2	53.9	57.5	49.6	7.9
22:00 - 22:05	55.3	55.1	44.8	48.3	-3.5
22:05 - 22:10	55.7	56.7	-	48.1	-
22:10 - 22:15	54.6	57.6	-	49.0	-
22:15 - 22:20	57.1	53.0	58.0	47.4	10.6
22:20 - 22:25	54.8	56.8	-	48.1	-
22:25 - 22:30	55.7	52.7	55.7	47.0	8.7
22:30 - 22:35	60.7	53.0	62.9	47.4	15.5
22:35 - 22:40	52.1	57.0	-	49.9	-
22:40 - 22:45	60.3	52.5	62.5	47.6	14.9
22:45 - 22:50	56.5	53.1	56.8	47.4	9.4
22:50 - 22:55	54.5	55.3	-	49.3	-
22:55 - 23:00	54.5	52.4	53.3	47.6	5.7
23:00 - 23:05	53.8	56.3	50.0	49.4	2.0
23:05 - 23:10	56.7	60.1	-	47.5	-
23:10 - 23:15	54.9	53.3	52.8	47.0	5.8
23:15 - 23:20	55.8	53.0	54.3	49.5	4.8
23:20 - 23:25	-	-	-	-	-
23:25 - 23:30	-	-	-	-	-
มาตรฐานเสียงรบกวน <sup>h,i,j</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1742

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Siracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 4949  
MEASURING DATE : 08-09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของเครื่องวัด	ระดับเสียง ขณะติดตั้ง ของเครื่องวัด L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงพื้นฐาน <sup>d</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
08/11/2025	23:30-23:35	56.0	52.6	56.3	9.4
	23:35-23:40	53.8	51.1	46.7	6.8
	23:40-23:45	57.8	52.3	46.4	13.0
	23:45-23:50	53.1	53.7	47.9	*
	23:50-23:55	53.1	55.7	47.5	*
	23:55-00:00	56.1	53.7	47.3	8.1
	00:00-00:05	55.0	52.6	46.4	7.9
	00:05-00:10	55.4	53.7	46.5	7.2
	00:10-00:15	50.7	64.2	46.1	18.1
	00:15-00:20	54.2	55.0	48.3	*
09/11/2025	00:20-00:25	59.3	50.4	44.8	16.9
	00:25-00:30	57.6	53.3	46.2	12.4
	00:30-00:35	54.9	51.2	46.4	9.1
	00:35-00:40	52.4	53.4	47.0	*
	00:40-00:45	52.0	49.8	44.5	6.5
	00:45-00:50	51.8	58.4	44.5	13.9
	00:50-00:55	55.4	51.3	44.5	11.8
	00:55-01:00	51.8	51.2	43.1	2.8
	01:00-01:05	52.6	49.7	46.2	3.5
	01:05-01:10	55.9	50.3	47.3	10.2
09/11/2025	01:10-01:15	51.9	52.9	47.9	*
	01:15-01:20	55.9	53.7	46.8	8.1
	01:20-01:25	53.2	51.2	46.8	5.1
	01:25-01:30	51.6	49.6	47.4	2.9
	01:30-01:35	54.7	50.5	46.8	8.8
	01:35-01:40	50.4	50.9	46.8	*
	01:40-01:45	53.0	49.8	46.6	6.6
	01:45-01:50	58.1	50.7	46.2	14.0
	01:50-01:55	51.4	49.4	46.2	3.9
	01:55-02:00	52.3	53.3	45.2	*
มาตรฐานเสียงรบกวน <sup>c,g</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Siracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 4949  
MEASURING DATE : 08-09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของเครื่องวัด	ระดับเสียง ขณะติดตั้ง ของเครื่องวัด L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงพื้นฐาน <sup>d</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
09/11/2025	02:00-02:05	49.0	52.0	52.0	44.0
	02:05-02:10	51.7	51.7	47.4	1.4
	02:10-02:15	53.5	53.5	54.4	8.2
	02:15-02:20	56.5	58.5	58.7	13.7
	02:20-02:25	51.0	51.0	*	*
	02:25-02:30	52.4	52.4	47.7	3.2
	02:30-02:35	52.6	52.6	53.7	8.2
	02:35-02:40	59.3	53.0	61.1	15.8
	02:40-02:45	53.3	52.1	50.1	2.2
	02:45-02:50	55.5	50.4	56.9	9.8
09/11/2025	02:50-02:55	50.8	50.8	*	*
	02:55-03:00	55.3	55.3	56.6	8.6
	03:00-03:05	51.5	51.5	49.6	*
	03:05-03:10	52.1	52.7	48.6	*
	03:10-03:15	52.9	54.4	48.4	*
	03:15-03:20	52.2	52.2	55.2	5.0
	03:20-03:25	51.1	51.1	48.2	*
	03:25-03:30	50.9	56.9	40.6	-7.6
	03:30-03:35	51.1	50.9	*	*
	03:35-03:40	52.6	53.5	*	*
09/11/2025	03:40-03:45	51.9	52.2	50.6	*
	03:45-03:50	55.6	55.8	49.7	*
	03:50-03:55	50.3	53.1	50.0	*
	03:55-04:00	54.0	52.1	47.9	4.6
	04:00-04:05	49.7	51.5	49.5	*
	04:05-04:10	55.4	58.5	49.2	*
	04:10-04:15	54.7	53.6	51.2	0.7
	04:15-04:20	48.8	54.2	50.2	*
	04:20-04:25	50.6	51.4	49.8	*
	04:25-04:30	51.6	51.6	48.5	*
มาตรฐานเสียงรบกวน <sup>c,g</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





## TEST REPORT

CUSTOMER	Ratch Prathana Energy Public Company Limited
ADDRESS	5/6 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20220
SAMPLE SOURCE	Ratch Prathana Energy Public Company Limited
SAMPLE POINT	TH110121016
PARAMETER*	126017151012016
DETERMINATION METHOD	ISO 1996-1:2016
INSTRUMENT	Integrated Sound Level Meter

SAMPLE NO.	44949
MEASURING DATE	08-09/11/2025
RECEIVED DATE	13/11/2025
REPORTED DATE	17/11/2025

[illegible]REMARK :  
 " Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)

<sup>a2</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>a3</sup> Start Time  
<sup>a4</sup> Measuring Date and Time : 12-13/11/2025  
<sup>a5</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022) and The Notification of Ministry of the Industry B.E. 2567 (2024)

บริษัท อิมพีเรียลโรดเคมิกส์ 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 4/4

FM-LAB-224/1/24-07-66



**EASTERN THAI CONSULTING 1992 CO., LTD.**  
6883 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 E-mail: [marketing@etc1992.com](mailto:marketing@etc1992.com)

## TEST REPORT

Customer  
Ratch Padhana Energy Public Company Limited\*\*  
Address  
616 Moo 11 Sukkaphiban 8 Rd., Nongkham, Srirachan, Choburiy 20730\*\*  
Sample Source  
Ratch Padhana Energy Public Company Limited\*\*  
Sample Point  
 $\frac{1}{L_{\text{eq}}}$   
Parameter  
 $L_{\text{eq}}$ ,  $L_{\text{max}}$ ,  $L_{\text{min}}$ ,  $L_{\text{avg}}$ ,  $L_{\text{peak}}$ ,  $L_{\text{val}}$ ,  $L_{\text{std}}$   
Measurement Method  
ISO 996-1:2016#  
Instrument  
Insulated Sound Level Meter

SAMPLE NO.	44950
MEASURING DATE	09-10/1
RECEIVED DATE	13/11/2
REPORTED DATE	17/11/2

TIME / DATE	09-10/11/2025 ( $L_{eq}$ )	09-10/11/2025 ( $L_{max}$ )	09-10/11/2025 ( $L_{avg}$ )	UNIT
10:00 - 11:00	56.1	74.8	50.9	dB(A)
11:00 - 12:00	56.2	72.3	51.2	dB(A)
12:00 - 13:00	56.4	73.9	51.5	dB(A)
13:00 - 14:00	56.4	76.9	50.7	dB(A)
14:00 - 15:00	56.5	79.1	50.8	dB(A)
15:00 - 16:00	56.2	79.5	50.8	dB(A)
16:00 - 17:00	58.8	84.6	52.4	dB(A)
17:00 - 18:00	60.3	84.5	53.7	dB(A)
18:00 - 19:00	57.3	85.2	50.8	dB(A)
19:00 - 20:00	57.7	81.1	50.7	dB(A)
20:00 - 21:00	56.8	75.7	49.5	dB(A)
21:00 - 22:00	55.9	78.8	48.5	dB(A)
22:00 - 23:00	55.9	80.9	47.3	dB(A)
23:00 - 00:00	54.6	76.9	47.1	dB(A)
00:00 - 01:00	57.9	90.1	46.1	dB(A)
01:00 - 02:00	53.0	82.2	45.6	dB(A)
02:00 - 03:00	54.3	82.0	45.5	dB(A)
03:00 - 04:00	52.0	74.5	45.3	dB(A)
04:00 - 05:00	51.2	72.9	45.5	dB(A)
05:00 - 06:00	55.2	74.2	48.0	dB(A)
06:00 - 07:00	56.2	76.9	50.8	dB(A)
07:00 - 08:00	59.4	76.4	53.8	dB(A)
08:00 - 09:00	56.9	78.5	51.1	dB(A)
09:00 - 10:00	57.1	78.3	51.8	dB(A)
$L_{eq,24\text{ hr.}}$	56.6	-	-	dB(A)
$L_{max}^{\#}$	61.8	-	-	dB(A)
Maximum	-	90.1	-	dB(A)
Standard	$70\text{ }^{+2}_{-2}$	$115\text{ }^{+2}_{-2}$	-	dB(A)

**REMARK:** \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

† This report/sampling plan is not listed/allocated in this report are not included in the L50 Accreditation Scheme for the Laboratory.

Dated November 25 1997

<sup>1)</sup> Notification of The National Environmental Board Volume 15 RF 7540 (1997)  
Dated November 22, 1997

<sup>12</sup> Notification of the National Environmental Council and a Communication of the Ministers of the Industry. P. 2548 (2005).

Notification of Ministry of the Industry D.E. 2548 (2002)

Start time

### Parameter Outside The Scope Of The Regulation Of The

(Ms. Thanaiporn Klinsophon is Section Head, Mrs. Wanpet  
Atthasorn, P.M. Clubhouse Management)

(Measurement By Mr. Supnakom Nop-

\* These Data are Non Laboratory Data

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1743

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการสั่นไหว  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44950  
MEASURING DATE : 09-10/1/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/1/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของแหล่งกำเนิด	ระดับเสียง ขณะติดตั้ง ของแหล่งกำเนิด $L_{eq}$ (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการทำงาน <sup>b</sup> dB(A)	ระดับเสียงทั้งหมด <sup>a</sup> $L_{tot}$ (dB(A))	ระดับการรบกวน dB(A)
09/11/2025	10:00 - 11:00 <sup>c</sup> 11:00 - 12:00 12:00 - 13:00 13:00 - 14:00 14:00 - 15:00 15:00 - 16:00 16:00 - 17:00 17:00 - 18:00 18:00 - 19:00 19:00 - 20:00 20:00 - 21:00 21:00 - 22:00 22:00 - 22:05 22:05 - 22:10 22:10 - 22:15 22:15 - 22:20 22:20 - 22:25 22:25 - 22:30 22:30 - 22:35 22:35 - 22:40 22:40 - 22:45 22:45 - 22:50 22:50 - 22:55 22:55 - 23:00 23:00 - 23:05 23:05 - 23:10 23:10 - 23:15 23:15 - 23:20 23:20 - 23:25 23:25 - 23:30	56.1 57.8 56.2 56.4 56.4 56.2 56.3 56.5 58.8 60.3 57.3 57.7 56.8 55.9 53.7 55.5 56.0 56.7 57.6 53.0 56.8 52.7 53.3 57.0 55.1 52.6 55.8 53.0 52.4 58.6 56.2 58.5 50.8 51.1	- - - - - - 54.3 54.4 49.4 - - - 47.9 - - - - - - 39.2 55.5 - - 60.4 - - - - - - - - - - - -	52.1 52.8 63.3 51.2 52.1 51.5 53.2 51.8 51.5 50.8 49.0 49.6 48.3 48.1 49.0 47.4 48.1 47.4 47.4 49.9 47.6 47.4 49.3 47.6 47.4 48.0 49.4 47.5 47.0 49.5	- - - - - - 2.8 1.2 -2.1 - - - -0.4 - - 11.5 13.2 0.4 10.4 -8.4 8.1 - - 12.4 - - - - - - - - - - - -
มาตรฐานเสียงรบกวน <sup>a,c,d</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphan 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการสั่นไหว  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44950  
MEASURING DATE : 09-10/1/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/1/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะติดตั้ง ของแหล่งกำเนิด	ระดับเสียง ขณะติดตั้ง ของแหล่งกำเนิด $L_{eq}$ (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการทำงาน <sup>b</sup> dB(A)	ระดับเสียงทั้งหมด <sup>a</sup> $L_{tot}$ (dB(A))	ระดับการรบกวน dB(A)
09/11/2025	23:30 - 23:35 23:35 - 23:40 23:40 - 23:45 23:45 - 23:50 23:50 - 23:55 23:55 - 00:00 00:00 - 00:05 00:05 - 00:10 00:10 - 00:15 00:15 - 00:20 00:20 - 00:25 00:25 - 00:30 00:30 - 00:35 00:35 - 00:40 00:40 - 00:45 00:45 - 00:50 00:50 - 00:55 00:55 - 01:00 01:00 - 01:05 01:05 - 01:10 01:10 - 01:15 01:15 - 01:20 01:20 - 01:25 01:25 - 01:30 01:30 - 01:35 01:35 - 01:40 01:40 - 01:45 01:45 - 01:50 01:50 - 01:55 01:55 - 02:00	54.0 53.2 55.0 51.5 49.7 53.7 52.8 56.6 56.6 50.3 53.9 53.3 55.5 49.9 50.4 50.4 49.8 51.8 48.6 51.2 51.2 48.9 47.7 49.0 51.1 54.8 53.6 52.4 51.9 53.2 59.1 50.6 48.3	52.6 51.1 52.3 53.7 55.7 53.7 52.6 53.6 50.7 55.0 50.4 53.3 51.2 53.4 49.8 51.3 51.3 51.3 50.3 52.9 53.7 51.2 49.6 50.5 50.9 49.8 50.7 49.4 53.3	51.4 52.0 54.7 - - - 57.4 56.6 - - 54.5 - - - 69.9 - 45.1 - - - - - 55.3 54.4 50.9 48.0 53.5 61.4 - -	4.5 5.3 8.3 - - - 11.0 10.1 - - 8.4 8.3 - - 25.4 - 2.0 - - - - 46.8 47.4 46.8 46.8 46.6 46.2 47.4 45.2
มาตรฐานเสียงรบกวน <sup>a,c,d</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
ISO/IEC 17025 Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
ISO/IEC 17025 Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1743

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44950  
MEASURING DATE : 09-10/1/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/1/2025

SN 01120952 : Class I

วัน/เวลา ของระดับเสียง ขณะตั้งเครื่อง ของแหล่งกำเนิด	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))
10/11/2025	02:00 - 02:05	54.3	49.0	55.8	44.0
	02:05 - 02:10	51.8	50.8	47.9	46.0
	02:10 - 02:15	57.5	49.3	59.8	46.2
	02:15 - 02:20	48.5	48.8	*	45.0
	02:20 - 02:25	53.8	53.4	46.2	46.9
	02:25 - 02:30	51.0	51.6	*	44.5
	02:30 - 02:35	51.5	48.1	51.8	45.5
	02:35 - 02:40	52.2	53.0	*	45.3
	02:40 - 02:45	52.1	51.3	*	47.9
	02:45 - 02:50	51.0	50.4	45.1	47.1
	02:50 - 02:55	60.0	51.9	62.3	46.9
	02:55 - 03:00	53.8	50.3	54.2	48.0
	03:00 - 03:05	54.8	59.1	*	49.6
	03:05 - 03:10	49.2	52.7	*	48.6
	03:10 - 03:15	54.1	54.4	*	48.4
	03:15 - 03:20	52.2	52.2	*	50.2
	03:20 - 03:25	51.1	51.3	*	48.2
	03:25 - 03:30	50.5	56.9	*	47.8
	03:30 - 03:35	50.2	50.9	*	48.2
	03:35 - 03:40	48.6	53.5	*	50.1
	03:40 - 03:45	54.4	52.2	53.4	50.6
	03:45 - 03:50	52.5	55.8	*	49.7
	03:50 - 03:55	49.8	53.1	*	50.0
	03:55 - 04:00	51.5	52.1	*	47.9
	04:00 - 04:05	50.4	51.5	*	49.5
	04:05 - 04:10	50.1	38.5	*	49.2
	04:10 - 04:15	51.4	53.6	*	50.5
	04:15 - 04:20	49.9	54.2	*	50.2
	04:20 - 04:25	50.8	51.4	*	49.8
	04:25 - 04:30	48.9	51.8	*	48.5
หมายเหตุ: ระดับเสียงรวม				ระดับเสียงรวม L <sub>eq</sub> (dB(A))	ระดับเสียงรวม dB(A)
				51.0	11.8
				50.5	1.9
				50.5	13.6
				50.2	-0.7
				51.3	6.3
				55.0	*
				55.9	*
				55.2	-2.0
				57.2	15.4
				56.5	6.2
				56.1	*
				56.3	*
				55.7	*
				55.2	*
				53.3	*
				53.2	*
				55.5	*
				57.7	*
				56.2	*
				59.4	*
				57.2	2.8
				56.6	*
				57.2	*
				51.4	*
				51.2	10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44950  
MEASURING DATE : 09-10/1/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/1/2025

SN 01120952 : Class I

วัน/เวลา ของระดับเสียง ขณะตั้งเครื่อง ของแหล่งกำเนิด	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))
10/11/2025	04:30 - 04:35	52.2	53.4	*	51.0
	04:35 - 04:40	51.0	53.3	*	50.5
	04:40 - 04:45	49.4	54.2	*	50.5
	04:45 - 04:50	53.7	53.4	44.9	-5.3
	04:50 - 04:55	51.8	58.4	*	50.9
	04:55 - 05:00	52.3	52.8	*	50.8
	05:00 - 05:05	52.4	56.1	*	51.3
	05:05 - 05:10	52.5	55.0	*	50.6
	05:10 - 05:15	52.4	55.9	*	50.0
	05:15 - 05:20	55.2	55.7	*	51.4
	05:20 - 05:25	57.2	56.4	52.5	51.7
	05:25 - 05:30	53.1	56.5	*	50.7
	05:30 - 05:35	55.1	56.1	*	50.0
	05:35 - 05:40	56.4	56.3	43.0	-8.4
	05:40 - 05:45	53.3	55.7	*	50.7
	05:45 - 05:50	56.3	55.2	52.8	50.3
	05:50 - 05:55	55.5	55.2	46.7	-3.2
	05:55 - 06:00	57.7	57.3	50.1	-0.5
	06:00 - 07:00	56.2	58.3	*	52.9
	07:00 - 08:00	59.4	59.0	48.8	54.7
	08:00 - 09:00	56.9	57.2	*	51.5
	09:00 - 10:00	57.1	56.6	47.5	51.2
หมายเหตุ: ระดับเสียงรวม				ระดับเสียงรวม L <sub>eq</sub> (dB(A))	ระดับเสียงรวม dB(A)
				51.0	*
				50.5	*
				50.2	-5.3
				50.8	*
				51.3	*
				50.6	*
				50.0	*
				51.4	-8.4
				50.7	*
				50.3	2.5
				49.9	-3.2
				50.6	-0.5
				52.9	*
				54.7	-5.9
				51.5	*
				51.2	-3.7
				47.5	10

REMARK :  
<sup>1)</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)  
<sup>2)</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>3)</sup> Start Time  
<sup>4)</sup> Measuring Date and Time : 12/13/1/2025  
<sup>5)</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022)  
<sup>6)</sup> and The Notification of Ministry of the Industry B.E. 2567 (2024)

\* Parameter Outside The Scope of The Registration of  
(Measurement By Mr. Suphakom Noppompiak)



Approved By :  
(MRS. WANPEN LIAOCHINDAWAT)  
17/1/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY







บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1744

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44951  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class I

วัน/เวลา ของระดับเสียง ขณะตั้งเครื่อง ของแหล่งกำเนิด		ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>h</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>g</sup> dB(A)	ระดับเสียงทั้งหมด <sup>h,g</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
10/11/2025	23:30 - 23:35	51.8	52.6	-	46.9	-
	23:35 - 23:40	59.0	51.1	61.2	46.7	14.5
	23:40 - 23:45	53.6	52.3	50.7	46.4	4.3
	23:45 - 23:50	54.2	53.7	47.6	47.9	-0.3
	23:50 - 23:55	54.1	55.7	-	47.5	-
	23:55 - 00:00	54.0	53.7	45.2	47.3	-2.1
	00:00 - 00:05	54.2	52.6	52.1	46.4	5.7
	00:05 - 00:10	59.6	53.6	61.3	46.5	14.8
	00:10 - 00:15	53.9	50.7	54.1	46.1	8.0
	00:15 - 00:20	52.4	55.0	-	48.3	-
	00:20 - 00:25	52.8	50.4	52.1	44.8	7.3
	00:25 - 00:30	51.0	53.3	-	45.2	-
	00:30 - 00:35	52.6	51.2	50.0	46.4	3.6
	00:35 - 00:40	51.0	53.4	-	47.0	-
	00:40 - 00:45	58.9	49.8	61.3	44.5	16.8
	00:45 - 00:50	48.7	51.8	-	44.5	-
	00:50 - 00:55	51.3	51.5	41.0	44.5	-3.5
	00:55 - 01:00	48.1	51.2	-	43.1	-
	01:00 - 01:05	52.8	51.3	50.5	46.2	4.3
	11/11/2025	01:05 - 01:10	51.7	50.3	49.1	47.3
01:10 - 01:15		50.4	52.9	-	47.9	-
01:15 - 01:20		51.7	53.7	-	47.9	-
01:20 - 01:25		58.7	51.2	60.8	46.8	14.0
01:25 - 01:30		51.3	49.6	49.4	47.4	2.0
01:30 - 01:35		51.7	50.5	48.5	46.8	1.7
01:35 - 01:40		56.7	50.9	58.4	46.8	11.6
01:40 - 01:45		54.1	49.8	55.1	46.6	8.5
01:45 - 01:50		50.0	50.7	-	46.2	-
01:50 - 01:55		51.5	49.4	50.3	46.2	4.1
01:55 - 02:00		48.3	53.3	-	45.2	-
มาตรฐานเสียงรบกวน <sup>h,g</sup>						10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44951  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class I

วัน/เวลา ของระดับเสียง ขณะตั้งเครื่อง ของแหล่งกำเนิด		ระดับเสียง ขณะเปิดเครื่อง ขณะตั้งเครื่อง L <sub>eq</sub> (dB(A))	ระดับเสียง <sup>h</sup> ขณะไม่ การรบกวน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>g</sup> dB(A)	ระดับเสียงทั้งหมด <sup>h,g</sup> L <sub>eq</sub> (dB(A))	ระดับการรบกวน dB(A)
11/11/2025	02:00 - 02:05	52.5	49.0	52.9	44.0	8.9
	02:05 - 02:10	51.3	50.8	44.7	46.0	-1.3
	02:10 - 02:15	-	49.3	-	46.2	-
	02:15 - 02:20	50.4	48.8	48.3	45.0	3.3
	02:20 - 02:25	50.1	53.4	-	46.9	-
	02:25 - 02:30	49.5	51.6	-	44.5	-
	02:30 - 02:35	49.7	48.1	47.6	45.5	2.1
	02:35 - 02:40	49.1	53.0	-	45.3	-
	02:40 - 02:45	52.9	52.1	48.2	47.9	0.3
	02:45 - 02:50	51.1	50.4	45.8	47.1	-1.3
	02:50 - 02:55	59.0	51.9	61.1	46.9	14.2
	02:55 - 03:00	48.9	50.3	-	48.0	-
	03:00 - 03:05	47.9	59.1	-	49.6	-
	03:05 - 03:10	50.9	52.7	-	48.6	-
	03:10 - 03:15	51.6	54.4	-	48.4	-
	03:15 - 03:20	48.9	52.2	-	50.2	-
	03:20 - 03:25	49.3	51.3	-	48.2	-
	03:25 - 03:30	50.2	56.9	-	47.8	-
	03:30 - 03:35	48.8	50.9	-	48.2	-
	03:35 - 03:40	50.2	53.5	-	50.1	-
	03:40 - 03:45	48.4	52.2	-	50.6	-
	03:45 - 03:50	51.6	55.8	-	49.7	-
	03:50 - 03:55	56.3	53.1	56.5	50.0	6.5
	03:55 - 04:00	49.3	52.1	-	47.9	-
	04:00 - 04:05	52.4	51.5	48.1	49.5	-1.4
	04:05 - 04:10	53.2	58.5	-	49.2	-
04:10 - 04:15	49.9	53.6	-	50.5	-	
04:15 - 04:20	54.2	54.2	-	50.2	-	
04:20 - 04:25	55.3	51.4	56.0	49.8	6.2	
04:25 - 04:30	54.2	51.8	53.5	48.5	5.0	
มาตรฐานเสียงรบกวน <sup>h,g</sup>						10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





Request No. LA68-R149  
Report No. R6811-1744

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44951  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

รายการ ของระดับเสียง ขณะวิ่งรถ	ระดับเสียง ขณะวิ่งรถ ตามเส้นทางวัด	ระดับเสียง ขณะวิ่งรถ ตามเส้นทางวัด	ระดับเสียง ขณะวิ่งรถ ตามเส้นทางวัด	ระดับเสียง ขณะวิ่งรถ ตามเส้นทางวัด
11/11/2025	04:30-04:35	53.4	65.5	51.0
	04:35-04:40	52.5	53.3	50.5
	04:40-04:45	53.9	54.2	50.5
	04:45-04:50	52.3	53.4	50.2
	04:50-04:55	49.9	58.4	50.9
	04:55-05:00	51.4	52.8	50.8
	05:00-05:05	51.3	56.1	51.3
	05:05-05:10	52.8	55.0	50.6
	05:10-05:15	57.1	55.9	50.0
	05:15-05:20	54.3	55.7	51.4
	05:20-05:25	54.9	56.4	50.7
	05:25-05:30	54.3	56.5	51.7
	05:30-05:35	56.6	56.1	50.0
	05:35-05:40	56.3	56.0	51.4
	05:40-05:45	56.3	55.7	50.7
	05:45-05:50	55.2	53.2	50.3
	05:50-05:55	55.9	50.6	49.9
	05:55-06:00	57.5	47.0	50.6
	06:00-07:00	57.2	58.3	52.9
	07:00-08:00	58.5	59.0	54.7
	08:00-09:00	58.0	50.3	51.5
	09:00-10:00	55.8	56.6	51.2

REMARK : 1) Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)

2) Notification of Ministry of the Industry B.E. 2548 (2005)

3) Start Time

4) Measuring Date and Time : 12/13/11/2025

5) Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022)

and The Notification of Ministry of the Industry B.E. 2567 (2024)

\* Parameter Outside The Scope of The Registration of The Department of Environmental Engineering Works  
(Measurement By Mr. Suphakorn Noppompiak)



Approved By

(MRS. WANPEN LIAOCHINDAWAT)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

EASTERN THAI CONSULTING 1992 CO., LTD.  
883 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : บ้านไร่ใหม่\*\*  
PARAMETER\* :  $L_{eq}$  1 hr,  $L_{eq}$  24 hr,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq}$   
DETERMINATION METHOD : ISO 1996-1:2016\*\*  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120952 : Class 1

SAMPLE NO. : 44952  
MEASURING DATE : 11/12/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	11-12/11/2025 ( $L_{eq}$ )	11-12/11/2025 ( $L_{max}$ )	11-12/11/2025 ( $L_{avg}$ )	UNIT
10:00 - 11:00 <sup>1)</sup>	55.6	76.0	51.3	dB(A)
11:00 - 12:00	56.4	76.8	51.6	dB(A)
12:00 - 13:00	56.2	80.1	51.6	dB(A)
13:00 - 14:00	56.0	77.0	51.5	dB(A)
14:00 - 15:00	56.0	73.2	52.1	dB(A)
15:00 - 16:00	57.7	77.5	52.8	dB(A)
16:00 - 17:00	56.8	80.2	52.2	dB(A)
17:00 - 18:00	58.7	80.4	52.7	dB(A)
18:00 - 19:00	57.4	75.6	52.3	dB(A)
19:00 - 20:00	57.3	73.2	51.6	dB(A)
20:00 - 21:00	58.1	82.7	50.4	dB(A)
21:00 - 22:00	56.1	83.3	48.8	dB(A)
22:00 - 23:00	55.0	75.3	47.8	dB(A)
23:00 - 00:00	55.1	77.1	47.1	dB(A)
00:00 - 01:00	53.0	71.4	45.5	dB(A)
01:00 - 02:00	50.5	71.1	44.9	dB(A)
02:00 - 03:00	51.6	72.8	46.3	dB(A)
03:00 - 04:00	52.0	74.1	45.7	dB(A)
04:00 - 05:00	51.4	75.2	44.9	dB(A)
05:00 - 06:00	55.0	74.7	47.6	dB(A)
06:00 - 07:00	57.2	80.3	51.8	dB(A)
07:00 - 08:00	58.5	77.1	53.8	dB(A)
08:00 - 09:00	56.5	75.4	51.6	dB(A)
09:00 - 10:00	55.8	75.1	51.6	dB(A)
$L_{eq}$ 24 hr:	56.1	-	-	dB(A)
$L_{avg}$	60.9	-	-	dB(A)
Maximum	83.3	-	-	dB(A)
Standard	70 <sup>2)</sup>	115 <sup>3)</sup>	-	dB(A)

REMARK : 1) Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

2) ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

3) Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

4) Notification of Ministry of the Industry B.E. 2548 (2005)

5) Start Time

\* Parameter Outside The Scope of The Registration of The Department of Environmental Engineering Works  
(Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Liao Chindawat is Assistant Section Head)  
(Measurement By Mr. Suphakorn Noppompiak)

\*\* These Data are Non Laboratory Data



Approved By

(MRS. WANPEN LIAOCHINDAWAT)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
883 หมู่ 11 ถนนจันทน์ 8 ต.จันทน์ อ.เมือง จ.สุราษฎร์ธานี 80000  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



EASTERN THAI CONSULTING 1992 CO., LTD.  
883 หมู่ 11 ถนนจันทน์ 8 ต.จันทน์ อ.เมือง จ.สุราษฎร์ธานี 80000  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1745

TEST REPORT

CUSTOMER : Ratch Palana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Palana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44952  
MEASURING DATE : 11/21/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/11/2025

SN 0112092 : Class I

วัน/เวลา ของระดับเสียง ขณะปฏิบัติงาน ของแหล่งกำเนิด	ระดับเสียง ขณะปฏิบัติงาน ขณะไม่ ทำงาน L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะปฏิบัติงาน ขณะไม่ ทำงาน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการทำงาน <sup>g</sup> dB(A)	ระดับเสียงทั้งหมด <sup>h</sup> L <sub>tot</sub> (dB(A))	ระดับเสียงรวม dB(A)
11/11/2025	10:00 - 11:00 <sup>g</sup>	57.8	-	52.1	-
	11:00 - 12:00	56.4	40.0	52.8	-12.8
	12:00 - 13:00	56.2	-	63.3	-
	13:00 - 14:00	56.0	-	58.0	-
	14:00 - 15:00	56.0	-	51.2	-
	15:00 - 16:00	57.7	47.1	52.1	-5.0
	16:00 - 17:00	56.8	-	51.5	-
	17:00 - 18:00	58.7	-	53.2	-
	18:00 - 19:00	57.4	-	51.8	-
	19:00 - 20:00	57.3	45.5	51.5	-6.0
	20:00 - 21:00	58.1	51.6	50.8	0.8
	21:00 - 22:00	56.1	-	49.0	-
	22:00 - 22:05	56.9	56.9	49.6	7.3
	22:05 - 22:10	55.1	44.8	48.3	-3.5
	22:10 - 22:15	54.4	-	48.1	-
	22:15 - 22:20	57.6	-	49.0	-
	22:20 - 22:25	55.3	54.4	47.4	7.0
	22:25 - 22:30	54.3	-	48.1	-
	22:30 - 22:35	52.8	39.4	47.0	-7.6
	22:35 - 22:40	53.0	-	47.4	-
	22:40 - 22:45	52.0	-	49.9	-
	22:45 - 22:50	55.3	55.1	47.6	7.5
	22:50 - 22:55	53.6	47.0	47.4	-0.4
	22:55 - 23:00	55.3	49.2	49.3	-0.1
	23:00 - 23:05	55.3	55.2	47.6	7.6
	23:05 - 23:10	52.4	49.5	48.0	1.5
	23:10 - 23:15	53.5	-	49.4	-
	23:15 - 23:20	54.8	-	47.5	-
	23:20 - 23:25	53.2	53.7	47.0	6.7
	23:25 - 23:30	52.8	-	49.5	-
มาตรฐานเสียงรบกวน <sup>g,h</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Palana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Palana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่ใหม่  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44952  
MEASURING DATE : 11/21/2025  
RECEIVED DATE : 13/1/2025  
REPORTED DATE : 17/11/2025

SN 0112092 : Class I

วัน/เวลา ของระดับเสียง ขณะปฏิบัติงาน ของแหล่งกำเนิด	ระดับเสียง ขณะปฏิบัติงาน ขณะไม่ ทำงาน L <sub>eq</sub> (dB(A))	ระดับเสียง ขณะปฏิบัติงาน ขณะไม่ ทำงาน L <sub>eq</sub> (dB(A))	ระดับเสียงขณะมีการทำงาน <sup>g</sup> dB(A)	ระดับเสียงทั้งหมด <sup>h</sup> L <sub>tot</sub> (dB(A))	ระดับเสียงรวม dB(A)
11/11/2025	23:30 - 23:35	51.5	-	52.6	-
	23:35 - 23:40	54.3	54.5	51.1	46.7
	23:40 - 23:45	59.0	61.0	52.3	46.4
	23:45 - 23:50	54.4	49.1	53.7	47.9
	23:50 - 23:55	54.9	-	55.7	47.5
	23:55 - 00:00	56.5	56.3	53.7	47.3
	00:00 - 00:05	54.2	52.1	52.6	46.4
	00:05 - 00:10	53.6	-	53.6	46.5
	00:10 - 00:15	53.1	52.4	50.7	46.1
	00:15 - 00:20	55.6	49.7	55.0	48.3
	00:20 - 00:25	53.4	53.4	50.4	44.8
	00:25 - 00:30	54.0	48.7	53.3	46.2
	00:30 - 00:35	50.9	-	51.2	46.4
	00:35 - 00:40	52.4	-	53.4	47.0
	00:40 - 00:45	53.7	54.4	49.8	44.5
	00:45 - 00:50	52.1	43.3	51.8	44.5
	00:50 - 00:55	46.3	-	51.3	43.3
	00:55 - 01:00	50.1	-	51.2	43.1
	01:00 - 01:05	51.2	-	51.3	46.2
	01:05 - 01:10	49.3	-	50.3	47.3
	01:10 - 01:15	49.5	-	52.9	47.9
	01:15 - 01:20	50.3	-	53.7	46.8
	01:20 - 01:25	52.2	48.3	51.2	46.8
	01:25 - 01:30	49.0	-	49.6	47.4
	01:30 - 01:35	49.5	-	50.5	46.8
	01:35 - 01:40	49.8	-	50.9	46.8
	01:40 - 01:45	53.2	53.5	49.8	46.6
	01:45 - 01:50	49.6	-	50.7	46.2
	01:50 - 01:55	47.2	-	49.4	46.2
	01:55 - 02:00	52.2	-	53.3	45.2
มาตรฐานเสียงรบกวน <sup>g,h</sup>					10

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





## บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com อี-เมล : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaplomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1745

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaplomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44952  
MEASURING DATE : 11/21/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด $L_{eq}$ (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงทั้งหมด <sup>a</sup> $L_{eq}$ (dB(A))	ระดับการรบกวน dB(A)
12/11/2025					
02:00 - 02:05	52.6	49.0	53.1	44.0	9.1
02:05 - 02:10	50.2	50.8	-	46.0	-
02:10 - 02:15	53.6	49.3	54.6	46.2	8.4
02:15 - 02:20	50.2	48.8	47.6	45.0	2.6
02:20 - 02:25	54.6	53.4	51.4	46.9	4.5
02:25 - 02:30	49.8	51.6	-	44.5	-
02:30 - 02:35	54.0	48.1	55.7	45.5	10.2
02:35 - 02:40	48.5	53.0	-	45.3	-
02:40 - 02:45	49.5	52.1	-	47.9	-
02:45 - 02:50	51.6	50.4	48.4	47.1	1.3
02:50 - 02:55	50.2	51.9	-	46.9	-
02:55 - 03:00	48.7	50.3	-	48.0	-
03:00 - 03:05	50.4	59.1	-	49.6	-
03:05 - 03:10	49.7	52.7	-	48.6	-
03:10 - 03:15	52.4	54.4	-	48.4	-
03:15 - 03:20	51.4	52.2	-	50.2	-
03:20 - 03:25	53.7	51.3	53.0	48.2	4.8
03:25 - 03:30	51.9	56.9	-	47.8	-
03:30 - 03:35	50.9	50.9	-	48.2	-
03:35 - 03:40	55.3	53.5	53.6	50.1	3.5
03:40 - 03:45	51.1	52.2	-	50.6	-
03:45 - 03:50	52.7	55.8	-	49.7	-
03:50 - 03:55	50.5	53.1	-	50.0	-
03:55 - 04:00	49.9	52.1	-	47.9	-
04:00 - 04:05	49.6	51.5	-	49.5	-
04:05 - 04:10	49.8	58.5	-	49.2	-
04:10 - 04:15	53.8	53.6	43.3	50.5	-7.2
04:15 - 04:20	47.3	54.2	-	50.2	-
04:20 - 04:25	51.4	51.4	45.3	49.8	-4.5
04:25 - 04:30	50.8	51.8	-	48.5	-
หมายเหตุเสียงรบกวน <sup>a,3</sup>					10

## REMARK :

- <sup>1</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)  
<sup>2</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>3</sup> Start Time  
<sup>4</sup> Measuring Date and Time : 12/13/11/2025  
<sup>5</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022)  
and The Notification of Ministry of the Industry B.E. 2567 (2024)  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
(Measurement By Mr. Suphakorn Noppompiak)



Approved By :  
(MRS. WANPEN LIMACHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaplomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com อี-เมล : info@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1745

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaplomb 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : บ้านไร่พนา  
PARAMETER\* : ระดับการรบกวน  
DETERMINATION METHOD : ISO 1996-1:2016  
INSTRUMENT : Integrated Sound Level Meter

SAMPLE NO. : 44952  
MEASURING DATE : 11/21/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

SN 01120952 : Class 1

วัน/เวลา ของระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด	ระดับเสียง ขณะเกิดเสียง ของแหล่งกำเนิด $L_{eq}$ (dB(A))	ระดับเสียง <sup>a</sup> ขณะไม่ การรบกวน $L_{eq}$ (dB(A))	ระดับเสียงขณะมีการรบกวน <sup>b</sup> dB(A)	ระดับเสียงทั้งหมด <sup>a</sup> $L_{eq}$ (dB(A))	ระดับการรบกวน dB(A)
12/11/2025					
04:30 - 04:35	50.2	53.4	-	51.0	-
04:35 - 04:40	49.6	53.3	-	50.5	-
04:40 - 04:45	51.9	54.2	-	50.5	-
04:45 - 04:50	53.7	53.4	44.9	50.2	-5.3
04:50 - 04:55	51.4	58.4	-	50.9	-
04:55 - 05:00	52.1	52.8	-	50.8	-
05:00 - 05:05	51.8	56.1	-	51.3	-
05:05 - 05:10	55.6	55.0	49.7	50.6	-0.9
05:10 - 05:15	51.3	55.9	-	50.0	-
05:15 - 05:20	57.5	55.7	55.8	51.4	4.4
05:20 - 05:25	55.9	56.4	-	51.7	-
05:25 - 05:30	54.4	56.5	-	50.7	-
05:30 - 05:35	56.8	56.1	51.5	50.0	1.5
05:35 - 05:40	54.0	56.3	-	51.4	-
05:40 - 05:45	55.1	55.7	-	50.7	-
05:45 - 05:50	52.9	55.2	-	50.3	-
05:50 - 05:55	54.9	55.2	-	49.9	-
05:55 - 06:00	56.0	57.3	-	50.6	-
06:00 - 07:00	57.2	58.3	-	52.9	-
07:00 - 08:00	58.5	59.0	-	54.7	-
08:00 - 09:00	56.5	57.2	-	51.5	-
09:00 - 10:00	55.8	56.6	-	51.2	-
หมายเหตุเสียงรบกวน <sup>a,3</sup>					10

- <sup>1</sup> Notification of Office of The National Environmental Board Volume 29 B.E. 2550 (2007)  
<sup>2</sup> Notification of Ministry of the Industry B.E. 2548 (2005)  
<sup>3</sup> Start Time  
<sup>4</sup> Measuring Date and Time : 12/13/11/2025  
<sup>5</sup> Measurement Follow The Announcement of The Pollution Control Board B.E. 2565 (2022)  
and The Notification of Ministry of the Industry B.E. 2567 (2024)  
\* Parameter Outside The Scope of The Registration of The Department of Industrial Works  
(Measurement By Mr. Suphakorn Noppompiak)



Approved By :  
(MRS. WANPEN LIMACHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY







## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com

ISO 9001 / ISO 14001

NSC-TISI-TIS 17025

TESTING 1712

Request No. LA68-R149  
Report No. R6811-1747

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงการผลิตไฟฟ้า\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741219 : Class 1

SAMPLE NO. : 44954  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	06-07/11/2025 ( $L_{eq}$ )	06-07/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	67.0	70.2	dB(A)
10:00 - 11:00	66.6	74.4	dB(A)
11:00 - 12:00	66.6	73.2	dB(A)
12:00 - 13:00	66.7	71.1	dB(A)
13:00 - 14:00	66.6	73.9	dB(A)
14:00 - 15:00	66.6	69.5	dB(A)
15:00 - 16:00	66.6	69.6	dB(A)
16:00 - 17:00	66.3	70.9	dB(A)
17:00 - 18:00	66.6	74.8	dB(A)
18:00 - 19:00	66.5	70.0	dB(A)
19:00 - 20:00	66.5	69.6	dB(A)
20:00 - 21:00	66.6	69.4	dB(A)
21:00 - 22:00	66.8	69.5	dB(A)
22:00 - 23:00	66.4	68.2	dB(A)
23:00 - 00:00	66.2	68.7	dB(A)
00:00 - 01:00	66.2	67.9	dB(A)
01:00 - 02:00	66.7	68.4	dB(A)
02:00 - 03:00	66.8	73.3	dB(A)
03:00 - 04:00	66.7	69.0	dB(A)
04:00 - 05:00	66.6	67.9	dB(A)
05:00 - 06:00	66.3	68.0	dB(A)
06:00 - 07:00	66.6	72.6	dB(A)
07:00 - 08:00	67.0	72.8	dB(A)
08:00 - 09:00	66.7	69.3	dB(A)
$L_{eq}$ 24 hr.	66.6	-	dB(A)
$L_{up}$ #	72.9	-	dB(A)
Maximum	-	74.8	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanee (Thanyaporn Klinsepon is Section Head, Management) (Measurement By Mr. Suphakorn Noppornplak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT) 17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com

ISO 9001 / ISO 14001

NSC-TISI-TIS 17025

TESTING 1712

Request No. LA68-R149  
Report No. R6811-1748

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงการผลิตไฟฟ้า\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741219 : Class 1

SAMPLE NO. : 44955  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	07-08/11/2025 ( $L_{eq}$ )	07-08/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	66.6	68.9	dB(A)
10:00 - 11:00	66.5	69.9	dB(A)
11:00 - 12:00	66.9	72.8	dB(A)
12:00 - 13:00	66.9	71.9	dB(A)
13:00 - 14:00	66.6	78.8	dB(A)
14:00 - 15:00	66.7	72.7	dB(A)
15:00 - 16:00	67.0	70.0	dB(A)
16:00 - 17:00	66.4	73.4	dB(A)
17:00 - 18:00	66.5	70.4	dB(A)
18:00 - 19:00	66.4	69.4	dB(A)
19:00 - 20:00	66.8	69.1	dB(A)
20:00 - 21:00	66.8	68.3	dB(A)
21:00 - 22:00	66.5	67.8	dB(A)
22:00 - 23:00	66.6	69.2	dB(A)
23:00 - 00:00	66.4	73.6	dB(A)
00:00 - 01:00	66.3	67.5	dB(A)
01:00 - 02:00	66.3	67.4	dB(A)
02:00 - 03:00	65.9	72.3	dB(A)
03:00 - 04:00	66.2	67.4	dB(A)
04:00 - 05:00	66.2	67.4	dB(A)
05:00 - 06:00	66.2	74.8	dB(A)
06:00 - 07:00	66.3	74.0	dB(A)
07:00 - 08:00	66.9	70.7	dB(A)
08:00 - 09:00	66.4	72.8	dB(A)
$L_{eq}$ 24 hr.	66.5	-	dB(A)
$L_{up}$ #	72.8	-	dB(A)
Maximum	-	78.8	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanee (Thanyaporn Klinsepon is Section Head, Management) (Measurement By Mr. Suphakorn Noppornplak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT) 17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47





## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 Email: marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1749

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงไฟฟ้าถ่านหินเทพารักษ์\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2016##  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741219 : Class 1

SAMPLE NO. : 44956  
MEASURING DATE : 08/09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	08-09/11/2025 ( $L_{eq}$ )	08-09/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	65.8	70.5	dB(A)
10:00 - 11:00	65.6	75.8	dB(A)
11:00 - 12:00	65.4	69.1	dB(A)
12:00 - 13:00	65.6	68.4	dB(A)
13:00 - 14:00	65.2	71.5	dB(A)
14:00 - 15:00	64.9	72.0	dB(A)
15:00 - 16:00	64.7	73.0	dB(A)
16:00 - 17:00	64.7	69.1	dB(A)
17:00 - 18:00	66.4	77.2	dB(A)
18:00 - 19:00	66.3	69.2	dB(A)
19:00 - 20:00	66.2	68.7	dB(A)
20:00 - 21:00	65.8	68.1	dB(A)
21:00 - 22:00	65.6	66.8	dB(A)
22:00 - 23:00	65.3	74.5	dB(A)
23:00 - 00:00	65.4	71.3	dB(A)
00:00 - 01:00	65.1	68.4	dB(A)
01:00 - 02:00	65.1	66.3	dB(A)
02:00 - 03:00	65.0	72.0	dB(A)
03:00 - 04:00	64.9	66.2	dB(A)
04:00 - 05:00	64.9	68.3	dB(A)
05:00 - 06:00	65.0	68.6	dB(A)
06:00 - 07:00	65.0	74.4	dB(A)
07:00 - 08:00	65.2	67.1	dB(A)
08:00 - 09:00	65.4	75.1	dB(A)
$L_{eq}$ 24 hr.	65.4	-	dB(A)
$L_{up}$ #	71.6	-	dB(A)
Maximum	-	77.2	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

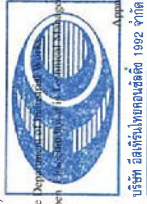
<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Noppomplak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 Email: marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1750

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงไฟฟ้าถ่านหินเทพารักษ์\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2016##  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741219 : Class 1

SAMPLE NO. : 44957  
MEASURING DATE : 09-10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	09-10/11/2025 ( $L_{eq}$ )	09-10/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	65.2	67.5	dB(A)
10:00 - 11:00	65.1	67.7	dB(A)
11:00 - 12:00	64.9	66.4	dB(A)
12:00 - 13:00	64.8	67.1	dB(A)
13:00 - 14:00	64.8	66.5	dB(A)
14:00 - 15:00	64.8	72.2	dB(A)
15:00 - 16:00	65.0	71.6	dB(A)
16:00 - 17:00	65.5	71.9	dB(A)
17:00 - 18:00	66.0	84.4	dB(A)
18:00 - 19:00	65.6	65.3	dB(A)
19:00 - 20:00	65.6	73.3	dB(A)
20:00 - 21:00	65.5	74.2	dB(A)
21:00 - 22:00	65.5	73.2	dB(A)
22:00 - 23:00	65.5	73.5	dB(A)
23:00 - 00:00	65.5	73.7	dB(A)
00:00 - 01:00	65.4	73.9	dB(A)
01:00 - 02:00	65.5	73.9	dB(A)
02:00 - 03:00	65.4	73.5	dB(A)
03:00 - 04:00	65.5	73.6	dB(A)
04:00 - 05:00	65.5	73.7	dB(A)
05:00 - 06:00	65.4	74.3	dB(A)
06:00 - 07:00	69.5	79.2	dB(A)
07:00 - 08:00	69.2	75.7	dB(A)
08:00 - 09:00	67.3	80.0	dB(A)
$L_{eq}$ 24 hr.	66.0	-	dB(A)
$L_{up}$ #	72.5	-	dB(A)
Maximum	-	84.4	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Noppomplak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47





## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

ISO 9001 / ISO 14001



883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1751

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงไฟฟ้าถ่านหินชัยภูมิ\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq} \#$   
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
S/N 00741219 : Class 1

SAMPLE NO. : 44958  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	10-11/11/2025 ( $L_{eq}$ )	10-11/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	66.7	73.6	dB(A)
10:00 - 11:00	66.8	75.5	dB(A)
11:00 - 12:00	66.5	74.1	dB(A)
12:00 - 13:00	66.6	79.3	dB(A)
13:00 - 14:00	69.1	79.7	dB(A)
14:00 - 15:00	68.0	77.3	dB(A)
15:00 - 16:00	67.3	73.5	dB(A)
16:00 - 17:00	67.4	73.7	dB(A)
17:00 - 18:00	67.3	74.7	dB(A)
18:00 - 19:00	67.3	79.5	dB(A)
19:00 - 20:00	67.2	73.4	dB(A)
20:00 - 21:00	66.8	73.3	dB(A)
21:00 - 22:00	66.8	73.2	dB(A)
22:00 - 23:00	66.6	73.5	dB(A)
23:00 - 00:00	66.6	73.6	dB(A)
00:00 - 01:00	66.5	74.5	dB(A)
01:00 - 02:00	66.5	74.0	dB(A)
02:00 - 03:00	66.5	73.2	dB(A)
03:00 - 04:00	66.5	75.0	dB(A)
04:00 - 05:00	66.4	73.6	dB(A)
05:00 - 06:00	66.5	74.9	dB(A)
06:00 - 07:00	66.8	74.3	dB(A)
07:00 - 08:00	67.2	79.6	dB(A)
08:00 - 09:00	67.2	73.7	dB(A)
$L_{eq}$ 24 hr.	67.0	-	dB(A)
$L_{90} \#$	73.1	-	dB(A)
Maximum	-	79.7	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

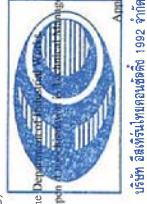
Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)  
<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lahaochindawat is Measurement By Mr. Suphakorn Noppornplak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1752

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตโรงไฟฟ้าถ่านหินชัยภูมิ\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq} \#$   
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
S/N 00741219 : Class 1

SAMPLE NO. : 44959  
MEASURING DATE : 11-12/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	11-12/11/2025 ( $L_{eq}$ )	11-12/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	67.2	84.1	dB(A)
10:00 - 11:00	66.5	75.6	dB(A)
11:00 - 12:00	66.5	73.7	dB(A)
12:00 - 13:00	66.5	73.3	dB(A)
13:00 - 14:00	66.4	73.7	dB(A)
14:00 - 15:00	66.5	74.5	dB(A)
15:00 - 16:00	66.6	73.0	dB(A)
16:00 - 17:00	66.7	74.2	dB(A)
17:00 - 18:00	66.9	73.7	dB(A)
18:00 - 19:00	66.7	72.9	dB(A)
19:00 - 20:00	66.9	74.9	dB(A)
20:00 - 21:00	66.7	75.0	dB(A)
21:00 - 22:00	66.5	72.6	dB(A)
22:00 - 23:00	66.8	73.8	dB(A)
23:00 - 00:00	66.4	73.0	dB(A)
00:00 - 01:00	66.4	73.7	dB(A)
01:00 - 02:00	66.3	75.5	dB(A)
02:00 - 03:00	66.2	73.7	dB(A)
03:00 - 04:00	66.2	73.5	dB(A)
04:00 - 05:00	66.1	73.0	dB(A)
05:00 - 06:00	66.2	74.0	dB(A)
06:00 - 07:00	66.5	73.7	dB(A)
07:00 - 08:00	66.9	76.0	dB(A)
08:00 - 09:00	66.9	73.2	dB(A)
$L_{eq}$ 24 hr.	66.6	-	dB(A)
$L_{90} \#$	72.8	-	dB(A)
Maximum	-	84.1	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

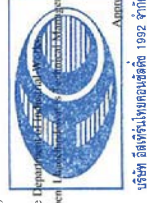
Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)  
<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lahaochindawat is Measurement By Mr. Suphakorn Noppornplak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



**EASTERN THAI CONSULTING 1992 CO., LTD.**  
883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



**NSC-TISI-TIS 17025**  
**TESTING 1712**

Request No. LA68-R1149  
Report No. R6811-1767

### TEST REPORT

**CUSTOMER** : Ratch Pathana Energy Public Company Limited\*\*  
**ADDRESS** : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
**SAMPLE SOURCE** : Ratch Pathana Energy Public Company Limited\*\*  
**SAMPLE POINT** : 3157.10 เมตรจากตัวอาคาร\*\*  
**PARAMETER\*** :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
**DETERMINATION METHOD** : ISO 1996-1:2016#  
**INSTRUMENT** : Integrated Sound Level Meter  
SN 01120946 : Class 1

**SAMPLE NO.** : 44974  
**MEASURING DATE** : 05-06/11/2025  
**RECEIVED DATE** : 13/11/2025  
**REPORTED DATE** : 17/11/2025

TIME / DATE	05-06/11/2025 ( $L_{eq}$ )	05-06/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>d</sup>	66.3	82.5	dB(A)
11:00 - 12:00	67.1	79.3	dB(A)
12:00 - 13:00	66.8	79.4	dB(A)
13:00 - 14:00	66.4	77.5	dB(A)
14:00 - 15:00	66.7	79.2	dB(A)
15:00 - 16:00	66.3	80.0	dB(A)
16:00 - 17:00	66.2	78.8	dB(A)
17:00 - 18:00	70.8	79.0	dB(A)
18:00 - 19:00	67.5	81.5	dB(A)
19:00 - 20:00	65.7	76.2	dB(A)
20:00 - 21:00	65.9	78.4	dB(A)
21:00 - 22:00	66.3	86.4	dB(A)
22:00 - 23:00	67.0	89.6	dB(A)
23:00 - 00:00	67.4	87.3	dB(A)
00:00 - 01:00	68.1	78.3	dB(A)
01:00 - 02:00	67.5	73.5	dB(A)
02:00 - 03:00	68.0	76.7	dB(A)
03:00 - 04:00	67.5	76.8	dB(A)
04:00 - 05:00	66.4	65.8	dB(A)
05:00 - 06:00	67.9	76.0	dB(A)
06:00 - 07:00	67.4	88.2	dB(A)
07:00 - 08:00	66.3	83.8	dB(A)
08:00 - 09:00	65.7	77.8	dB(A)
09:00 - 10:00	65.6	76.3	dB(A)
$L_{eq}$ 24 hr.	67.1	-	dB(A)
$L_{up}$ #	73.8	-	dB(A)
Maximum	89.6	-	dB(A)
Standard	70 <sup>h,i,j</sup>	115 <sup>h,i,j</sup>	dB(A)

**REMARK :** \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level, Dated November 25, 1997

<sup>d</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>e</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>h</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) (Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

**EASTERN THAI CONSULTING 1992 CO., LTD.**  
883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1768



**NSC-TISI-TIS 17025**  
**TESTING 1712**

### TEST REPORT

**CUSTOMER** : Ratch Pathana Energy Public Company Limited\*\*  
**ADDRESS** : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
**SAMPLE SOURCE** : Ratch Pathana Energy Public Company Limited\*\*  
**SAMPLE POINT** : 3157.10 เมตรจากตัวอาคาร\*\*  
**PARAMETER\*** :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
**DETERMINATION METHOD** : ISO 1996-1:2016#  
**INSTRUMENT** : Integrated Sound Level Meter  
SN 01120946 : Class 1

**SAMPLE NO.** : 44975  
**MEASURING DATE** : 06-07/11/2025  
**RECEIVED DATE** : 13/11/2025  
**REPORTED DATE** : 17/11/2025

TIME / DATE	06-07/11/2025 ( $L_{eq}$ )	06-07/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>d</sup>	65.6	74.9	dB(A)
11:00 - 12:00	66.3	80.2	dB(A)
12:00 - 13:00	66.2	85.1	dB(A)
13:00 - 14:00	66.0	84.7	dB(A)
14:00 - 15:00	65.6	76.0	dB(A)
15:00 - 16:00	65.2	78.6	dB(A)
16:00 - 17:00	65.4	83.5	dB(A)
17:00 - 18:00	70.0	82.1	dB(A)
18:00 - 19:00	66.3	82.8	dB(A)
19:00 - 20:00	65.2	86.1	dB(A)
20:00 - 21:00	64.7	76.3	dB(A)
21:00 - 22:00	64.5	74.2	dB(A)
22:00 - 23:00	64.6	73.7	dB(A)
23:00 - 00:00	65.1	80.2	dB(A)
00:00 - 01:00	64.7	64.2	dB(A)
01:00 - 02:00	64.9	64.4	dB(A)
02:00 - 03:00	65.3	73.3	dB(A)
03:00 - 04:00	65.9	73.1	dB(A)
04:00 - 05:00	66.2	73.8	dB(A)
05:00 - 06:00	67.5	75.7	dB(A)
06:00 - 07:00	66.0	80.6	dB(A)
07:00 - 08:00	66.1	83.7	dB(A)
08:00 - 09:00	65.8	81.7	dB(A)
09:00 - 10:00	65.5	83.6	dB(A)
$L_{eq}$ 24 hr.	65.9	-	dB(A)
$L_{up}$ #	72.1	-	dB(A)
Maximum	86.1	-	dB(A)
Standard	70 <sup>h,i,j</sup>	115 <sup>h,i,j</sup>	dB(A)

**REMARK :** \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level, Dated November 25, 1997

<sup>d</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>e</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>h</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) (Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax: 0-3848-2095 Email: marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1769

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด/โครงการพัฒนาศักยภาพ\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq}$  #  
DETERMINATION METHOD : ISO 1996-1:2016 #  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120946 : Class 1

SAMPLE NO. : 44976  
MEASURING DATE : 07/08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	07-08/11/2025 ( $L_{eq}$ )	07-08/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	66.0	81.9	dB(A)
11:00 - 12:00	66.0	78.8	dB(A)
12:00 - 13:00	65.9	78.2	dB(A)
13:00 - 14:00	65.6	76.2	dB(A)
14:00 - 15:00	67.4	76.8	dB(A)
15:00 - 16:00	70.7	78.1	dB(A)
16:00 - 17:00	67.0	83.7	dB(A)
17:00 - 18:00	71.0	91.5	dB(A)
18:00 - 19:00	68.1	67.2	dB(A)
19:00 - 20:00	66.8	83.7	dB(A)
20:00 - 21:00	66.1	79.7	dB(A)
21:00 - 22:00	66.0	73.2	dB(A)
22:00 - 23:00	67.1	75.8	dB(A)
23:00 - 00:00	66.9	77.4	dB(A)
00:00 - 01:00	67.1	74.7	dB(A)
01:00 - 02:00	67.3	73.8	dB(A)
02:00 - 03:00	67.4	73.8	dB(A)
03:00 - 04:00	67.4	74.4	dB(A)
04:00 - 05:00	67.7	74.9	dB(A)
05:00 - 06:00	68.1	79.0	dB(A)
06:00 - 07:00	68.5	83.2	dB(A)
07:00 - 08:00	67.0	83.1	dB(A)
08:00 - 09:00	66.2	78.8	dB(A)
09:00 - 10:00	66.5	74.4	dB(A)
$L_{eq}$ 24 hr.	67.5	-	dB(A)
$L_{avg}$ #	73.9	91.5	dB(A)
Maximum	-	115 <sup>b,c</sup>	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lhaochindawat is Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1770

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด/โครงการพัฒนาศักยภาพ\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq}$  #  
DETERMINATION METHOD : ISO 1996-1:2016 #  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120946 : Class 1

SAMPLE NO. : 44977  
MEASURING DATE : 08-09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	08-09/11/2025 ( $L_{eq}$ )	08-09/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	65.8	81.0	dB(A)
11:00 - 12:00	66.7	77.8	dB(A)
12:00 - 13:00	66.5	76.7	dB(A)
13:00 - 14:00	66.8	80.8	dB(A)
14:00 - 15:00	66.1	75.1	dB(A)
15:00 - 16:00	65.7	80.7	dB(A)
16:00 - 17:00	65.1	77.9	dB(A)
17:00 - 18:00	70.7	81.3	dB(A)
18:00 - 19:00	66.4	81.3	dB(A)
19:00 - 20:00	65.1	78.2	dB(A)
20:00 - 21:00	65.6	78.9	dB(A)
21:00 - 22:00	65.6	72.9	dB(A)
22:00 - 23:00	65.2	73.5	dB(A)
23:00 - 00:00	65.4	64.6	dB(A)
00:00 - 01:00	66.5	73.9	dB(A)
01:00 - 02:00	66.5	73.2	dB(A)
02:00 - 03:00	66.6	77.2	dB(A)
03:00 - 04:00	66.3	73.7	dB(A)
04:00 - 05:00	66.4	74.6	dB(A)
05:00 - 06:00	67.4	76.3	dB(A)
06:00 - 07:00	67.5	89.5	dB(A)
07:00 - 08:00	67.3	83.1	dB(A)
08:00 - 09:00	67.1	82.5	dB(A)
09:00 - 10:00	67.1	76.7	dB(A)
$L_{eq}$ 24 hr.	66.7	-	dB(A)
$L_{avg}$ #	72.9	89.5	dB(A)
Maximum	-	115 <sup>b,c</sup>	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lhaochindawat is Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47





## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1771

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 100 เมตร หน้าที่ดิน\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ <sup>g</sup>  
DETERMINATION METHOD : ISO 1996-1:2016/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120946 : Class 1

SAMPLE NO. : 4478  
MEASURING DATE : 09-10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	09-10/11/2025 ( $L_{eq}$ )	09-10/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>h</sup>	67.1	77.8	dB(A)
11:00 - 12:00	67.0	78.9	dB(A)
12:00 - 13:00	67.3	80.6	dB(A)
13:00 - 14:00	67.4	77.8	dB(A)
14:00 - 15:00	66.9	77.1	dB(A)
15:00 - 16:00	67.0	77.0	dB(A)
16:00 - 17:00	66.7	77.2	dB(A)
17:00 - 18:00	70.3	84.3	dB(A)
18:00 - 19:00	67.6	82.9	dB(A)
19:00 - 20:00	66.3	87.4	dB(A)
20:00 - 21:00	65.9	78.6	dB(A)
21:00 - 22:00	64.0	76.5	dB(A)
22:00 - 23:00	65.3	76.5	dB(A)
23:00 - 00:00	63.5	74.9	dB(A)
00:00 - 01:00	62.4	72.5	dB(A)
01:00 - 02:00	63.6	72.4	dB(A)
02:00 - 03:00	63.3	72.6	dB(A)
03:00 - 04:00	63.7	72.3	dB(A)
04:00 - 05:00	64.5	72.7	dB(A)
05:00 - 06:00	65.2	77.5	dB(A)
06:00 - 07:00	64.7	85.7	dB(A)
07:00 - 08:00	66.2	81.2	dB(A)
08:00 - 09:00	66.8	81.6	dB(A)
09:00 - 10:00	66.9	78.6	dB(A)
$L_{eq}$ 24 hr.	66.2	-	dB(A)
$L_{up}$ <sup>h</sup>	71.1	-	dB(A)
Maximum	-	87.4	dB(A)
Standard	70 <sup>i,j,k</sup>	115 <sup>i,j,k</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory  
\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level, Dated November 25, 1997

<sup>1</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>2</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>3</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Nopporpiak))

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT) 17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1772

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 100 เมตร หน้าที่ดิน\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ <sup>g</sup>  
DETERMINATION METHOD : ISO 1996-1:2016/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120946 : Class 1

SAMPLE NO. : 4479  
MEASURING DATE : 10-11/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	10-11/11/2025 ( $L_{eq}$ )	10-11/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>h</sup>	64.7	77.0	dB(A)
11:00 - 12:00	65.1	79.2	dB(A)
12:00 - 13:00	66.1	87.6	dB(A)
13:00 - 14:00	68.6	83.4	dB(A)
14:00 - 15:00	64.1	80.7	dB(A)
15:00 - 16:00	63.5	79.6	dB(A)
16:00 - 17:00	63.5	80.9	dB(A)
17:00 - 18:00	69.3	77.5	dB(A)
18:00 - 19:00	66.9	83.0	dB(A)
19:00 - 20:00	68.0	76.2	dB(A)
20:00 - 21:00	65.9	75.1	dB(A)
21:00 - 22:00	65.9	77.5	dB(A)
22:00 - 23:00	66.5	77.8	dB(A)
23:00 - 00:00	65.5	75.4	dB(A)
00:00 - 01:00	64.7	73.1	dB(A)
01:00 - 02:00	65.3	72.8	dB(A)
02:00 - 03:00	64.8	72.8	dB(A)
03:00 - 04:00	66.3	74.2	dB(A)
04:00 - 05:00	67.6	77.0	dB(A)
05:00 - 06:00	67.2	76.4	dB(A)
06:00 - 07:00	66.0	85.7	dB(A)
07:00 - 08:00	65.7	83.1	dB(A)
08:00 - 09:00	65.5	90.0	dB(A)
09:00 - 10:00	65.3	77.4	dB(A)
$L_{eq}$ 24 hr.	66.2	-	dB(A)
$L_{up}$ <sup>h</sup>	72.5	-	dB(A)
Maximum	-	90.0	dB(A)
Standard	70 <sup>i,j,k</sup>	115 <sup>i,j,k</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory  
\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level, Dated November 25, 1997

<sup>1</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>2</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>3</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Nopporpiak))

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT) 17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47





## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001

TESTING 1712

Request No. LA68-R149  
Report No. R6811-1773

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด-โรงไฟฟ้าห้วยป่าสัก\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2001/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 01120946 : Class 1

SAMPLE NO. : 44980  
MEASURING DATE : 11-12/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	11-12/11/2025 ( $L_{max}$ )	11-12/11/2025 ( $L_{eq}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	65.1	79.1	dB(A)
11:00 - 12:00	66.0	78.5	dB(A)
12:00 - 13:00	66.0	76.4	dB(A)
13:00 - 14:00	66.4	78.7	dB(A)
14:00 - 15:00	66.0	78.3	dB(A)
15:00 - 16:00	64.9	81.6	dB(A)
16:00 - 17:00	64.9	83.3	dB(A)
17:00 - 18:00	69.8	77.9	dB(A)
18:00 - 19:00	65.6	77.3	dB(A)
19:00 - 20:00	63.9	77.9	dB(A)
20:00 - 21:00	63.3	73.4	dB(A)
21:00 - 22:00	64.6	75.7	dB(A)
22:00 - 23:00	66.1	75.8	dB(A)
23:00 - 00:00	65.6	64.8	dB(A)
00:00 - 01:00	64.6	63.9	dB(A)
01:00 - 02:00	65.1	72.9	dB(A)
02:00 - 03:00	64.2	73.9	dB(A)
03:00 - 04:00	64.7	72.6	dB(A)
04:00 - 05:00	66.4	74.9	dB(A)
05:00 - 06:00	66.3	73.0	dB(A)
06:00 - 07:00	65.7	78.2	dB(A)
07:00 - 08:00	64.8	79.5	dB(A)
08:00 - 09:00	66.3	82.6	dB(A)
09:00 - 10:00	64.5	82.6	dB(A)
$L_{eq}$ 24 hr.	65.7	-	dB(A)
$L_{up}$ #	71.9	-	dB(A)
Maximum	-	83.3	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) (Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By :  
นางสาว อธิวิมล ใจเย็น (MRS. WANPEN LIAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FW-LAB-016/001-08-47



## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001

TESTING 1712

Request No. LA68-R149  
Report No. R6811-1753

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sirachha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด-โรงไฟฟ้าห้วยป่าสัก\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ #  
DETERMINATION METHOD : ISO 1996-1:2001/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741218 : Class 1

SAMPLE NO. : 44960  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	05-06/11/2025 ( $L_{eq}$ )	05-06/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	60.3	74.9	dB(A)
10:00 - 11:00	63.7	77.1	dB(A)
11:00 - 12:00	57.7	75.3	dB(A)
12:00 - 13:00	59.1	76.9	dB(A)
13:00 - 14:00	58.7	74.9	dB(A)
14:00 - 15:00	57.7	81.3	dB(A)
15:00 - 16:00	58.3	77.6	dB(A)
16:00 - 17:00	59.1	78.0	dB(A)
17:00 - 18:00	70.0	78.8	dB(A)
18:00 - 19:00	67.0	81.3	dB(A)
19:00 - 20:00	61.8	82.9	dB(A)
20:00 - 21:00	62.0	83.2	dB(A)
21:00 - 22:00	59.1	78.8	dB(A)
22:00 - 23:00	56.0	76.5	dB(A)
23:00 - 00:00	55.0	75.4	dB(A)
00:00 - 01:00	54.4	73.8	dB(A)
01:00 - 02:00	56.9	80.9	dB(A)
02:00 - 03:00	56.7	82.9	dB(A)
03:00 - 04:00	54.8	70.1	dB(A)
04:00 - 05:00	60.9	75.9	dB(A)
05:00 - 06:00	66.0	75.2	dB(A)
06:00 - 07:00	60.5	74.4	dB(A)
07:00 - 08:00	62.1	79.6	dB(A)
08:00 - 09:00	58.6	80.7	dB(A)
$L_{eq}$ 24 hr.	61.9	-	dB(A)
$L_{up}$ #	66.8	-	dB(A)
Maximum	-	83.2	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) (Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By :  
นางสาว อธิวิมล ใจเย็น (MRS. WANPEN LIAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FW-LAB-016/001-08-47



# EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



ISO 9001 / ISO 14001  
TESTING 1712

Request No. LA68-R1149  
Report No. R6811-1754

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : 3.157 กิโลเมตรจากสี่แยกบ้านดอน  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ <sup>1/2</sup>  
DETERMINATION METHOD : ISO 1996-1:2001/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741218 : Class 1

SAMPLE NO. : 44961  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	06-07/11/2025 ( $L_{eq}$ )	06-07/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>1/3</sup>	57.2	76.9	dB(A)
10:00 - 11:00	56.3	76.8	dB(A)
11:00 - 12:00	58.9	80.2	dB(A)
12:00 - 13:00	58.5	76.7	dB(A)
13:00 - 14:00	58.0	76.1	dB(A)
14:00 - 15:00	57.6	76.6	dB(A)
15:00 - 16:00	57.9	80.8	dB(A)
16:00 - 17:00	59.3	84.3	dB(A)
17:00 - 18:00	70.6	86.2	dB(A)
18:00 - 19:00	66.4	83.2	dB(A)
19:00 - 20:00	61.3	82.0	dB(A)
20:00 - 21:00	60.8	77.7	dB(A)
21:00 - 22:00	59.9	83.9	dB(A)
22:00 - 23:00	54.0	74.8	dB(A)
23:00 - 00:00	53.5	71.7	dB(A)
00:00 - 01:00	53.3	74.3	dB(A)
01:00 - 02:00	52.7	67.0	dB(A)
02:00 - 03:00	55.1	71.8	dB(A)
03:00 - 04:00	54.9	72.3	dB(A)
04:00 - 05:00	59.5	77.2	dB(A)
05:00 - 06:00	65.0	75.6	dB(A)
06:00 - 07:00	62.9	77.3	dB(A)
07:00 - 08:00	62.2	77.1	dB(A)
08:00 - 09:00	58.1	72.7	dB(A)
$L_{eq}$ 24 hr.	61.6	-	dB(A)
$L_{up}$ <sup>1/2</sup>	66.3	-	dB(A)
Maximum	-	86.2	dB(A)
Standard	70 <sup>1/2</sup>	115 <sup>1/2</sup>	dB(A)

REMARK : <sup>1/3</sup> Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>1/4</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>1/5</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>1/6</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>1/7</sup> Start Time

<sup>1/8</sup> Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsoop in Section Head, Mrs. Wanpen Lhaochindawatt (Measurement By Mr. Suphakorn Noppornpiak)

<sup>1/9</sup> These Data are Non Laboratory Data



Approved By : (MRS. WANPEN LHAOCHINDAWATT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

# EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



TESTING 1712

Request No. LA68-R1149  
Report No. R6811-1755

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : 3.157 กิโลเมตรจากสี่แยกบ้านดอน  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq}$  24 hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{up}$ <sup>1/2</sup>  
DETERMINATION METHOD : ISO 1996-1:2001/6#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741218 : Class 1

SAMPLE NO. : 44962  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	07-08/11/2025 ( $L_{eq}$ )	07-08/11/2025 ( $L_{max}$ )	UNIT
09:00 - 10:00 <sup>1/3</sup>	58.2	74.6	dB(A)
10:00 - 11:00	57.3	78.1	dB(A)
11:00 - 12:00	58.4	76.0	dB(A)
12:00 - 13:00	58.6	77.6	dB(A)
13:00 - 14:00	57.1	75.1	dB(A)
14:00 - 15:00	57.9	80.1	dB(A)
15:00 - 16:00	58.0	73.3	dB(A)
16:00 - 17:00	59.0	75.0	dB(A)
17:00 - 18:00	70.1	80.3	dB(A)
18:00 - 19:00	65.9	77.2	dB(A)
19:00 - 20:00	62.2	81.3	dB(A)
20:00 - 21:00	60.9	82.2	dB(A)
21:00 - 22:00	58.7	82.1	dB(A)
22:00 - 23:00	54.8	75.2	dB(A)
23:00 - 00:00	55.0	80.3	dB(A)
00:00 - 01:00	54.3	78.9	dB(A)
01:00 - 02:00	53.9	80.8	dB(A)
02:00 - 03:00	51.4	67.6	dB(A)
03:00 - 04:00	54.8	75.1	dB(A)
04:00 - 05:00	59.2	76.5	dB(A)
05:00 - 06:00	64.3	83.1	dB(A)
06:00 - 07:00	62.0	79.7	dB(A)
07:00 - 08:00	59.2	75.5	dB(A)
08:00 - 09:00	57.4	80.0	dB(A)
$L_{eq}$ 24 hr.	61.1	-	dB(A)
$L_{up}$ <sup>1/2</sup>	65.8	-	dB(A)
Maximum	-	83.1	dB(A)
Standard	70 <sup>1/2</sup>	115 <sup>1/2</sup>	dB(A)

REMARK : <sup>1/3</sup> Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>1/4</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

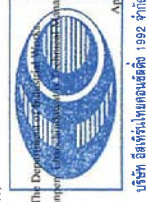
<sup>1/5</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>1/6</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>1/7</sup> Start Time

<sup>1/8</sup> Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsoop in Section Head, Mrs. Wanpen Lhaochindawatt (Measurement By Mr. Suphakorn Noppornpiak)

<sup>1/9</sup> These Data are Non Laboratory Data



Approved By : (MRS. WANPEN LHAOCHINDAWATT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





683 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel: 0-3848-1197-8 0-3876-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com

Request No. LA68-R1149  
Report No. R6811-1756

## TEST REPORT

CUSTOMER	: Ratch Pathana Energy Public Company Limited**
ADDRESS	: 616 Moo 11 Sukhaphitum 8 Rd., Nongkham, Sriracha, Chonburi 20330**
SAMPLE SOURCE	: Ratch Pathana Energy Public Company Limited**
SAMPLE POINT	: 31571 โครงการนำร่องพลังงานทดแทน**
PARAMETER #	: $L_{95}$ 1 hr., $L_{95}$ 24 hr., $L_{95}$ , $L_{95}$ และ $L_{95}$ #
INTERPRETATION METHOD	: ISO 9996-1:2016##
INSTRUMENT	: Integrated Sound Level Meter

TIME DATE	08-09/11/2025 ( $t_{\text{ref}}$ )	08-09/11/2025 ( $t_{\text{max}}$ )	08-09/11/2025 ( $t_{\text{avg}}$ )	UNIT
09:00 - 10:00 <sup>9</sup>	57.5	74.9	54.0	dB(A)
10:00 - 11:00	57.2	78.8	53.4	dB(A)
11:00 - 12:00	57.4	77.9	53.6	dB(A)
12:00 - 13:00	58.8	78.9	54.4	dB(A)
13:00 - 14:00	57.1	77.3	54.0	dB(A)
14:00 - 15:00	57.8	81.8	53.6	dB(A)
15:00 - 16:00	57.9	86.5	53.1	dB(A)
16:00 - 17:00	57.7	77.6	54.1	dB(A)
17:00 - 18:00	69.5	84.1	67.5	dB(A)
18:00 - 19:00	67.4	85.0	64.6	dB(A)
19:00 - 20:00	59.4	79.6	55.1	dB(A)
20:00 - 21:00	58.2	79.3	54.2	dB(A)
21:00 - 22:00	59.1	79.1	53.0	dB(A)
22:00 - 23:00	55.3	75.0	51.8	dB(A)
23:00 - 00:00	53.6	72.8	51.0	dB(A)
00:00 - 01:00	51.3	69.8	50.0	dB(A)
01:00 - 02:00	53.3	78.4	50.3	dB(A)
02:00 - 03:00	52.0	69.7	50.3	dB(A)
03:00 - 04:00	51.6	68.4	50.4	dB(A)
04:00 - 05:00	58.1	77.2	52.1	dB(A)
05:00 - 06:00	63.5	79.8	59.7	dB(A)
06:00 - 07:00	60.9	78.5	56.2	dB(A)
07:00 - 08:00	56.5	79.5	52.0	dB(A)
08:00 - 09:00	55.8	78.8	51.1	dB(A)
$L_{eq, 24 \text{ h}}$	60.6	-	-	dB(A)
$L_{\text{day}}^{\#}$	65.0	-	-	dB(A)
Maximum	-	86.5	-	dB(A)
Standard	20, 30, 32	11, 15, 17, 2	-	dB(A)

**REMARK:** \* Test Report/Sampling marked 'Not TISI Accredited' in this report are not included in the TISI Accreditation Schedule for our laboratory.  
<sup>14</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on This General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on the Calculation of The Noise Level, on This General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on the Calculation of The Noise Level.

Dated November 25, 1997

<sup>1)</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>2)</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

*n* Start Time

\* Parameter Outside The Scope of The Department's Curriculum Work  
(Ms. Thanaporn Klinsootin in Section Head, Mrs. Wanpen  
Jaisriyaporn, The School Management)

(Measurement By Mr. Suphakorn Nopporpiak)

\*\* These Data are Non Laboratory Data

Approved By:  (MRS. WANPEN LHAOCHINDAWAT)  
17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1  
FM-LAB-036/001-08-47

ACCREDITED  
ISO 9001 / ISO 14001



683 Moo 11 Sukhapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel: 0-3848-1197-8 0-3876-3031-2 Fax: 0-3848-2095 E-mail: marketing@elc1992.com

Request No. LA68-R1149  
Report No. R6811-1757

## TEST REPORT

CUSTOMER	: Ratch Pathana Energy Public Company Limited**
ADDRESS	: 636 Moo 11 Sukkaphum 8 Rd., Nongkhua, Sriracha, Chonburi 20230**
SAMPLE SOURCE	: Ratch Pathana Energy Public Company Limited**
SAMPLE POINT	: 31575 ตร.กม.ด้านทิศเหนือของถนน
PARAMETER#	: $L_{eq} \pm 1$ hr, 24 hr, $L_{max}$ , $L_{avg}$ & $L_{eq}$ #
DETERMINATION METHOD	: ISO 9996-1:2001 #/H
INSTRUMENT	: Integrated Sound Level Meter

TIME DATE	09-10/11/2025 ( $t_{\text{end}}$ )	09-10/11/2025 ( $t_{\text{max}}$ )	09-10/11/2025 ( $t_{\text{avg}}$ )	UNIT
09:00 - 10:00 <sup>a</sup>	55.7	74.2	50.9	dB(A)
10:00 - 11:00	55.2	73.7	51.7	dB(A)
11:00 - 12:00	55.0	77.7	51.9	dB(A)
12:00 - 13:00	56.8	78.3	51.6	dB(A)
13:00 - 14:00	55.8	78.2	51.3	dB(A)
14:00 - 15:00	55.4	74.5	51.3	dB(A)
15:00 - 16:00	57.2	77.7	51.4	dB(A)
16:00 - 17:00	57.9	75.7	51.9	dB(A)
17:00 - 18:00	69.8	86.9	67.9	dB(A)
18:00 - 19:00	64.1	75.8	61.3	dB(A)
19:00 - 20:00	58.0	77.1	51.3	dB(A)
20:00 - 21:00	59.1	80.3	51.3	dB(A)
21:00 - 22:00	55.0	77.8	50.4	dB(A)
22:00 - 23:00	54.5	77.1	50.2	dB(A)
23:00 - 00:00	52.0	68.6	50.0	dB(A)
00:00 - 01:00	51.9	70.6	49.7	dB(A)
01:00 - 02:00	52.5	78.3	49.9	dB(A)
02:00 - 03:00	54.1	74.3	50.0	dB(A)
03:00 - 04:00	53.6	77.4	49.9	dB(A)
04:00 - 05:00	59.6	77.2	53.6	dB(A)
05:00 - 06:00	65.2	76.9	62.1	dB(A)
06:00 - 07:00	62.9	74.5	59.7	dB(A)
07:00 - 08:00	62.5	77.7	58.8	dB(A)
08:00 - 09:00	58.1	77.5	55.0	dB(A)
$L_{\text{eq}}$ 24 hr.	60.5	-	-	dB(A)
$L_{\text{day}}$ #	65.9	-	-	dB(A)
Maximum	-	86.9	-	dB(A)
Standard	$\text{max } L_{\text{eq}}^{1,2}$	$\text{max } L_{\text{eq}}^{1,2}$	$\text{max } L_{\text{eq}}^{1,2}$	dB(A)

**REMARK:** \* Test Report/Sampling method 'Not TISI Accredited' in this report are not included in the TISI Accreditation Schedule for our laboratory  
 \*\* ISO 1996-12016, Notification of the Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on the General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level, on the General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level,

Dated November 25, 1997

<sup>11</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>12</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

**\* Parameter Outside The Scope of The Department of Industrial Works**  
(Ms. Tanaporn Klinsoop in Section Head, Mrs. Wanpen Jongsakulwong, (Faculty Management))  
(Measurement By Mr. Suphakorn Nopporpiak)

Approved By:  (MRS. WANPEN LHAOCHINDAWAT)  
วันที่ ๒๒ กันยายน ๒๕๖๕ 17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1  
FM-LAB-036.001-08-47









## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1760

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตทุ่งกุลาพื้นที่เกษตรกรรม\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq} 24$  hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq} \#$   
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741217 : Class 1

SAMPLE NO. : 44867  
MEASURING DATE : 05-06/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	05-06/11/2025 ( $L_{eq}$ )	05-06/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	65.0	75.2	dB(A)
11:00 - 12:00	65.8	73.7	dB(A)
12:00 - 13:00	65.8	75.9	dB(A)
13:00 - 14:00	65.4	81.6	dB(A)
14:00 - 15:00	65.3	75.3	dB(A)
15:00 - 16:00	65.4	75.5	dB(A)
16:00 - 17:00	65.2	72.7	dB(A)
17:00 - 18:00	65.7	77.2	dB(A)
18:00 - 19:00	65.4	64.6	dB(A)
19:00 - 20:00	64.8	77.1	dB(A)
20:00 - 21:00	64.9	75.9	dB(A)
21:00 - 22:00	64.9	83.8	dB(A)
22:00 - 23:00	65.1	84.3	dB(A)
23:00 - 00:00	65.4	83.7	dB(A)
00:00 - 01:00	66.4	77.9	dB(A)
01:00 - 02:00	66.0	73.8	dB(A)
02:00 - 03:00	66.1	73.9	dB(A)
03:00 - 04:00	65.7	76.0	dB(A)
04:00 - 05:00	64.4	75.6	dB(A)
05:00 - 06:00	65.6	78.2	dB(A)
06:00 - 07:00	66.4	83.3	dB(A)
07:00 - 08:00	68.3	81.8	dB(A)
08:00 - 09:00	65.2	75.6	dB(A)
09:00 - 10:00	66.3	85.3	dB(A)
$L_{eq} 24$ hr.:	65.5	-	dB(A)
$L_{90} \#$	72.1	-	dB(A)
Maximum	-	85.3	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : <sup>a</sup> Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>a</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lhaochindawat is Measurement By Mr. Suphakorn Noppornpink)

\*\* These Data are Non Laboratory Data



Approved By.....

17/11/2025

(MRS. WANPEN LHAOCHINDAWAT)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



FW-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1761

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : รังสิตทุ่งกุลาพื้นที่เกษตรกรรม\*\*  
PARAMETER\* :  $L_{eq}$  1 hr.,  $L_{eq} 24$  hr.,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq} \#$   
DETERMINATION METHOD : ISO 1996-1:2016#  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741217 : Class 1

SAMPLE NO. : 44868  
MEASURING DATE : 06-07/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME / DATE	06-07/11/2025 ( $L_{eq}$ )	06-07/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	65.2	87.5	dB(A)
11:00 - 12:00	64.7	86.7	dB(A)
12:00 - 13:00	64.4	80.9	dB(A)
13:00 - 14:00	63.8	76.4	dB(A)
14:00 - 15:00	63.6	79.0	dB(A)
15:00 - 16:00	63.2	75.4	dB(A)
16:00 - 17:00	63.9	81.5	dB(A)
17:00 - 18:00	64.5	80.8	dB(A)
18:00 - 19:00	64.5	80.1	dB(A)
19:00 - 20:00	64.6	82.3	dB(A)
20:00 - 21:00	64.1	76.6	dB(A)
21:00 - 22:00	64.0	75.4	dB(A)
22:00 - 23:00	64.5	76.5	dB(A)
23:00 - 00:00	64.5	74.7	dB(A)
00:00 - 01:00	64.4	76.0	dB(A)
01:00 - 02:00	64.4	78.5	dB(A)
02:00 - 03:00	64.5	76.0	dB(A)
03:00 - 04:00	64.6	75.1	dB(A)
04:00 - 05:00	64.7	76.2	dB(A)
05:00 - 06:00	65.8	76.6	dB(A)
06:00 - 07:00	65.9	81.7	dB(A)
07:00 - 08:00	64.8	75.9	dB(A)
08:00 - 09:00	64.7	81.9	dB(A)
09:00 - 10:00	63.9	79.8	dB(A)
$L_{eq} 24$ hr.:	64.5	-	dB(A)
$L_{90} \#$	71.2	-	dB(A)
Maximum	-	87.5	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>b,c</sup>	dB(A)

REMARK : <sup>a</sup> Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>a</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>a</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>a</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpen Lhaochindawat is Measurement By Mr. Suphakorn Noppornpink)

\*\* These Data are Non Laboratory Data



Approved By.....

17/11/2025

(MRS. WANPEN LHAOCHINDAWAT)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCE EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



FW-LAB-036/001-08-47



## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R149  
Report No. R6811-1762

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 100 เมตร จากอาคาร\*\*  
PARAMETER\* :  $L_{eq}$  1 hr,  $L_{eq}$  24 hr,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq}$  #  
DETERMINATION METHOD : ISO 1996-1:2016 #  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741217 : Class 1

SAMPLE NO. : 44969  
MEASURING DATE : 07-08/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	07-08/11/2025 ( $L_{eq}$ )	07-08/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	64.0	79.2	dB(A)
11:00 - 12:00	64.3	77.7	dB(A)
12:00 - 13:00	64.8	80.9	dB(A)
13:00 - 14:00	63.6	72.5	dB(A)
14:00 - 15:00	63.6	76.4	dB(A)
15:00 - 16:00	71.9	94.5	dB(A)
16:00 - 17:00	63.9	73.8	dB(A)
17:00 - 18:00	64.7	83.8	dB(A)
18:00 - 19:00	64.7	75.2	dB(A)
19:00 - 20:00	64.8	76.5	dB(A)
20:00 - 21:00	65.5	81.9	dB(A)
21:00 - 22:00	65.2	78.9	dB(A)
22:00 - 23:00	65.8	77.3	dB(A)
23:00 - 00:00	65.4	74.4	dB(A)
00:00 - 01:00	65.7	75.4	dB(A)
01:00 - 02:00	65.1	75.0	dB(A)
02:00 - 03:00	64.7	74.0	dB(A)
03:00 - 04:00	65.0	75.8	dB(A)
04:00 - 05:00	64.5	73.9	dB(A)
05:00 - 06:00	65.4	78.2	dB(A)
06:00 - 07:00	66.2	76.0	dB(A)
07:00 - 08:00	65.5	72.0	dB(A)
08:00 - 09:00	64.5	72.9	dB(A)
09:00 - 10:00	64.8	72.3	dB(A)
$L_{eq}$ 24 hr.	65.6	-	dB(A)
$L_{max}$ #	71.8	-	dB(A)
Maximum	94.5	-	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>c</sup>	dB(A)

REMARK : \*\* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>a</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

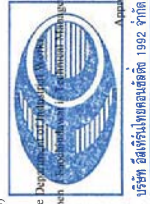
<sup>b</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>c</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>d</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Noppompiak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 Email : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1763

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 100 เมตร จากอาคาร\*\*  
PARAMETER\* :  $L_{eq}$  1 hr,  $L_{eq}$  24 hr,  $L_{max}$ ,  $L_{avg}$  &  $L_{eq}$  #  
DETERMINATION METHOD : ISO 1996-1:2016 #  
INSTRUMENT : Integrated Sound Level Meter  
SN 00741217 : Class 1

SAMPLE NO. : 44970  
MEASURING DATE : 08-09/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	08-09/11/2025 ( $L_{eq}$ )	08-09/11/2025 ( $L_{max}$ )	UNIT
10:00 - 11:00 <sup>a</sup>	65.5	75.0	dB(A)
11:00 - 12:00	65.2	74.0	dB(A)
12:00 - 13:00	64.6	74.3	dB(A)
13:00 - 14:00	64.5	74.5	dB(A)
14:00 - 15:00	63.9	77.6	dB(A)
15:00 - 16:00	64.0	74.9	dB(A)
16:00 - 17:00	64.0	81.1	dB(A)
17:00 - 18:00	64.3	76.4	dB(A)
18:00 - 19:00	65.2	81.3	dB(A)
19:00 - 20:00	65.6	74.2	dB(A)
20:00 - 21:00	65.5	75.4	dB(A)
21:00 - 22:00	65.3	73.4	dB(A)
22:00 - 23:00	65.1	74.5	dB(A)
23:00 - 00:00	65.1	76.1	dB(A)
00:00 - 01:00	66.4	78.5	dB(A)
01:00 - 02:00	66.1	77.9	dB(A)
02:00 - 03:00	65.8	74.9	dB(A)
03:00 - 04:00	65.3	74.6	dB(A)
04:00 - 05:00	65.8	77.8	dB(A)
05:00 - 06:00	66.0	76.3	dB(A)
06:00 - 07:00	66.5	82.7	dB(A)
07:00 - 08:00	66.1	79.0	dB(A)
08:00 - 09:00	66.5	76.5	dB(A)
09:00 - 10:00	66.4	75.8	dB(A)
$L_{eq}$ 24 hr.	65.4	-	dB(A)
$L_{max}$ #	72.1	-	dB(A)
Maximum	82.7	-	dB(A)
Standard	70 <sup>b,c</sup>	115 <sup>c</sup>	dB(A)

REMARK : \*\* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

<sup>a</sup> ISO 1996-1:2016, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>b</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>c</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>d</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thanaporn Klinsepon is Section Head, Mrs. Wanpet (Measurement By Mr. Suphakorn Noppompiak)

\*\* These Data are Non Laboratory Data



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax: 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax: 0-3848-2095 E-mail : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1764

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 1 hr. L<sub>eq</sub> 24 hr. L<sub>max</sub> L<sub>avg</sub> & L<sub>wp</sub>#  
PARAMETER\* : ISO 1996-1:2001/6#  
DETERMINATION METHOD : Integrated Sound Level Meter  
INSTRUMENT : SN 00741217 : Class 1

SAMPLE NO. : 44971  
MEASURING DATE : 09/10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	09-10/11/2025 (L <sub>eq</sub> )	09-10/11/2025 (L <sub>max</sub> )	UNIT
10:00 - 11:00 <sup>d</sup>	66.0	77.2	dB(A)
11:00 - 12:00	66.2	80.4	dB(A)
12:00 - 13:00	66.7	78.5	dB(A)
13:00 - 14:00	66.5	76.6	dB(A)
14:00 - 15:00	66.2	83.3	dB(A)
15:00 - 16:00	65.9	76.9	dB(A)
16:00 - 17:00	65.7	79.3	dB(A)
17:00 - 18:00	66.8	86.8	dB(A)
18:00 - 19:00	66.8	79.7	dB(A)
19:00 - 20:00	67.0	81.7	dB(A)
20:00 - 21:00	66.3	77.8	dB(A)
21:00 - 22:00	66.5	81.3	dB(A)
22:00 - 23:00	66.1	79.9	dB(A)
23:00 - 00:00	66.2	74.9	dB(A)
00:00 - 01:00	65.8	77.9	dB(A)
01:00 - 02:00	65.1	78.3	dB(A)
02:00 - 03:00	65.0	64.4	dB(A)
03:00 - 04:00	65.0	80.3	dB(A)
04:00 - 05:00	65.0	76.0	dB(A)
05:00 - 06:00	65.4	81.6	dB(A)
06:00 - 07:00	66.0	79.9	dB(A)
07:00 - 08:00	66.7	79.7	dB(A)
08:00 - 09:00	66.5	79.8	dB(A)
09:00 - 10:00	65.3	79.1	dB(A)
L <sub>eq</sub> 24 hr.	66.1	-	dB(A)
L <sub>wp</sub> #	72.1	-	dB(A)
Maximum	-	86.8	dB(A)
Standard	70 <sup>e,f</sup>	115 <sup>g,h</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2001/6, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thaniporn Klinsoon is Section Head, Mrs. Wanpen Lhaochindawat is Assistant Section Head, and Mr. Suphakorn Noppornpiak is Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)

17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax: 0-3848-2095 E-mail : marketing@etc1992.com

Request No. LA68-R149  
Report No. R6811-1765

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*  
SAMPLE POINT : ร้อยเอ็ด 1 hr. L<sub>eq</sub> 24 hr. L<sub>max</sub> L<sub>avg</sub> & L<sub>wp</sub>#  
PARAMETER\* : ISO 1996-1:2001/6#  
DETERMINATION METHOD : Integrated Sound Level Meter  
INSTRUMENT : SN 00741217 : Class 1

SAMPLE NO. : 44972  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 13/11/2025  
REPORTED DATE : 17/11/2025

TIME \ DATE	10-11/11/2025 (L <sub>eq</sub> )	10-11/11/2025 (L <sub>max</sub> )	UNIT
10:00 - 11:00 <sup>d</sup>	64.1	73.9	dB(A)
11:00 - 12:00	64.2	74.2	dB(A)
12:00 - 13:00	64.6	78.8	dB(A)
13:00 - 14:00	69.1	94.6	dB(A)
14:00 - 15:00	65.0	75.7	dB(A)
15:00 - 16:00	64.2	81.6	dB(A)
16:00 - 17:00	64.3	79.2	dB(A)
17:00 - 18:00	64.4	76.8	dB(A)
18:00 - 19:00	64.9	84.9	dB(A)
19:00 - 20:00	65.4	77.1	dB(A)
20:00 - 21:00	65.7	81.3	dB(A)
21:00 - 22:00	65.6	70.0	dB(A)
22:00 - 23:00	65.5	69.1	dB(A)
23:00 - 00:00	65.3	71.3	dB(A)
00:00 - 01:00	64.8	75.5	dB(A)
01:00 - 02:00	64.9	79.7	dB(A)
02:00 - 03:00	64.8	77.2	dB(A)
03:00 - 04:00	64.8	76.3	dB(A)
04:00 - 05:00	65.0	72.9	dB(A)
05:00 - 06:00	65.5	78.4	dB(A)
06:00 - 07:00	65.5	79.5	dB(A)
07:00 - 08:00	65.1	83.8	dB(A)
08:00 - 09:00	65.4	78.2	dB(A)
09:00 - 10:00	64.6	72.1	dB(A)
L <sub>eq</sub> 24 hr.	65.2	-	dB(A)
L <sub>wp</sub> #	71.6	-	dB(A)
Maximum	-	94.6	dB(A)
Standard	70 <sup>e,f</sup>	115 <sup>g,h</sup>	dB(A)

REMARK : \* Test Report/Sampling marked "Not TISI Accredited" in this report are not included in the TISI Accreditation Schedule for our laboratory

\*\* ISO 1996-1:2001/6, Notification of The Department of Industrial Works on Methods for Measuring Noise Annoyance, Noise Level 24-Hour Average and Maximum Noise Level From Factory B.E. 2567 (2024), Dated February 21, 2024, Notification of The National Environmental Board Volume 15 B.E. 2540 (1997) on The General Noise Level Standards, Dated April 3, 1997, Notification of The Pollution Control Department on The Calculation of The Noise Level.

Dated November 25, 1997

<sup>a</sup> Notification of The National Environmental Board Volume 15 B.E. 2540 (1997)

<sup>b</sup> Notification of Ministry of the Industry B.E. 2548 (2005)

<sup>c</sup> Start Time

\* Parameter Outside The Scope of The Registration of The Department of Industrial Works (Ms. Thaniporn Klinsoon is Section Head, Mrs. Wanpen Lhaochindawat is Assistant Section Head, and Mr. Suphakorn Noppornpiak is Measurement By Mr. Suphakorn Noppornpiak)

\*\* These Data are Non Laboratory Data



Approved By: (MRS. WANPEN LHAOCHINDAWAT)

17/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FN-LAB-036/001-08-47





# EASTERN THAI CONSULTING 1992 CO., LTD.

883 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R1149  
Report No. R6811-1766

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*

SAMPLE POINT : 3117-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-2278-2279-2280-2281-2282-2283-2284-2285-2286-2287-2288-2289-2290-2291-2292-2293-2294-2295-2296-2297-2298-2299-2300-2301-2302-2303-2304-2305-2306-2307-2308-2309-2310-2311-2312-2313-2314-2315-2316-2317-2318-2319-2320-2321-2322-2323-2324-2325-2326-2327-2328-2329-2330-2331-2332-2333-2334-2335-2336-2337-2338-2339-2340-2341-2342-2343-2344-2345-2346-2347-2348-2349-2350-2351-2352-2353-2354-2355-2356-2357-2358-2359-2360-2361-2362-2363-2364-2365-2366-2367-2368-2369-2370-2371-2372-2373-2374-2375-2376-2377-2378-2379-2380-2381-2382-2383-2384-2385-2386-2387-2388-2389-2390-2391-2392-2393-2394-2395-2396-2397-2398-2399-2400-2401-2402-2403-2404-2405-2406-2407-2408-2409-2410-2411-2412-2413-2414-2415-2416-2417-2418-2419-2420-2421-2422-2423-2424-2425-2426-2427-2428-2429-2430-2431-2432-2433-2434-2435-2436-2437-2438-2439-2440-2441-2442-2443-2444-2445-2446-2447-2448-2449-2450-2451-2452-2453-2454-2455-2456-2457-2458-2459-2460-2461-2462-2463-2464-2465-2466-2467-2468-2469-2470-2471-2472-2473-2474-2475-2476-2477-2478-2479-2480-2481-2482-2483-2484-2485-2486-2487-2488-2489-2490-2491-2492-2493-2494-2495-2496-2497-2498-2499-2500-2501-2502-2503-2504-2505-2506-2507-2508-2509-2510-2511-2512-2513-2514-2515-2516-2517-2518-2519-2520-2521-2522-2523-2524-2525-2526-2527-2528-2529-2530-2531-2532-2533-2534-2535-2536-2537-2538-2539-2540-2541-2542-2543-2544-2545-2546-2547-2548-2549-2550-2551-2552-2553-2554-2555-2556-2557-2558-2559-2560-2561-2562-2563-2564-2565-2566-2567-2568-2569-2570-2571-2572-2573-2574-2575-2576-2577-2578-2579-2580-2581-2582-2583-2584-2585-2586-2587-2588-2589-2590-2591-2592-2593-2594-2595-2596-2597-2598-2599-2600-2601-2602-2603-2604-2605-2606-2607-2608-2609-2610-2611-2612-2613-2614-2615-2616-2617-2618-2619-2620-2621-2622-2623-2624-2625-2626-2627-2628-2629-2630-2631-2632-2633-2634-2635-2636-2637-2638-2639-2640-2641-2642-2643-2644-2645-2646-2647-2648-2649-2650-2651-2652-2653-2654-2655-2656-2657-2658-2659-2660-2661-2662-2663-2664-2665-2666-2667-2668-2669-2670-2671-2672-2673-2674-2675-2676-2677-2678-2679-2680-2681-2682-2683-2684-2685-2686-2687-2688-2689-2690-2691-2692-2693-2694-2695-2696-2697-2698-2699-2700-2701-2702-2703-2704-2705-2706-2707-2708-2709-2710-2711-2712-2713-2714-2715-2716-2717-2718-2719-2720-2721-2722-2723-2724-2725-2726-2727-2728-2729-2730-2731-2732-2733-2734-2735-2736-2737-2738-2739-2740-2741-2742-2743-2744-2745-2746-2747-2748-2749-2750-2751-2752-2753-2754-2755-2756-2757-2758-2759-2760-2761-2762-2763-2764-2765-2766-2767-2768-2769-2770-2771-2772-2773-2774-2775-2776-2777-2778-2779-2780-2781-2782-2783-2784-2785-2786-2787-2788-2789-2790-2791-2792-2793-2794-2795-2796-2797-2798-2799-2800-2801-2802-2803-2804-2805-2806-2807-2808-2809-2810-2811-2812-2813-2814-2815-2816-2817-2818-2819-2820-2821-2822-2823-2824-2825-2826-2827-2828-2829-2830-2831-2832-2833-2834-2835-2836-2837-2838-2839-2840-2841-2842-2843-2844-2845-2846-2847-2848-2849-2850-2851-2852-2853-2854-2855-2856-2857-2858-2859-2860-2861-2862-2863-2864-2865-2866-2867-2868-2869-2870-2871-2872-2873-2874-2875-2876-2877-2878-2879-2880-2881-2882-2883-2884-2885-2886-2887-2888-2889-2890-2891-2892-2893-2894-2895-2896-2897-2898-2899-2900-2901-2902-2903-2904-2905-2906-2907-2908-2909-2910-2911-2912-2913-2914-2915-2916-2917-2918-2919-2920-2921-2922-2923-2924-2925-2926-2927-2928-2929-2930-2931-2932-2933-2934-2935-2936-2937-2938-2939-2940-2941-2942-2943-2944-2945-2946-2947-2948-2949-2950-2951-2952-2953-2954-2955-2956-2957-2958-2959-2960-2961-2962-2963-2964-2965-2966-2967-2968-2969-2970-2971-2972-2973-2974-2975-2976-2977-2978-2979-2980-2981-2982-2983-2984-2985-2986-2987-2988-2989-2990-2991-2992-2993-2994-2995-2996-2997-2998-2999-3000-3001-3002-3003-3004-3005-3006-3007-3008-3009-3010-3011-3012-3013-3014-3015-3016-3017-3018-3019-3020-3021-3022-3023-3024-3025-3026-3027-3028-3029-3030-3031-3032-3033-3034-3035-3036-3037-3038-3039-3040-3041-3042-3043-3044-3045-3046-3047-3048-3049-3050-3051-3052-3053-3054-3055-3056-3057-3058-3059-3060-3061-3062-3063-3064-3065-3066-3067-3068-3069-3070-3071-3072-3073-3074-3075-3076-3077-3078-3079-3080-3081-3082-3083-3084-3085-3086-3087-3088-3089-3090-3091-3092-3093-3094-3095-3096-3097-3098-3099-3100-3101-3102-3103-3104-3105-3106-3107-3108-3109-3110-3111-3112-3113-3114-3115-3116-3117-3118-3119-3120-3121-3122-3123-3124-3125-3126-3127-3128-3129-3130-3131-3132-3133-3134-3135-3136-3137-3138-3139-3140-3141-3142-3143-3144-3145-3146-3147-3148-3149-3150-3151-3152-3153-3154-3155-3156-3157-3158-3159-3160-3161-3162-3163-3164-3165-3166-3167-3168-3169-3170-3171-3172-3173-3174-3175-3176-3177-3178-3179-3180-3181-3182-3183-3184-3185-3186-3187-3188-3189-3190-3191-3192-3193-3194-3195-3196-3197-3198-3199-3200-3201-3202-3203-3204-3205-3206-3207-3208-3209-3210-3211-3212-3213-3214-3215-3216-3217-3218-3219-3220-3221-3222-3223-3224-3225-3226-3227-3228-3229-3230-3231-3232-3233-3234-3235-3236-3237-3238-3239-3240-3241-3242-3243-3244-3245-3246-3247-3248-3249-3250-3251-3252-3253-3254-3255-3256-3257-3258-3259-3260-3261-3262-3263-3264-3265-3266-3267-3268-3269-3270-3271-3272-3273-3274-3275-3276-3277-3278-3279-3280-3281-3282-3283-3284-3285-3286-3287-3288-3289-3290-3291-3292-3293-3294-3295-3296-3297-3298-3299-3300-3301-3302-3303-3304-3305-3306-3307-3308-3309-3310-3311-3312-3313-3314-3315-3316-3317-3318-3319-3320-3321-3322-3323-3324-3325-3326-3327-3328-3329-3330-3331-3332-3333-3334-3335-3336-3337-3338-3339-3340-3341-3342-3343-3344-3345-3346-3347-3348-3349-3350-3351-3352-3353-3354-3355-3356-3357-3358-3359-3360-3361-3362-3363-3364-3365-3366-3





## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : [marketing@etc1992.com](mailto:marketing@etc1992.com)

ISO 9001 / ISO 14001



NSC-TIS-TIS 17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3255

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Steam Turbine No. 2\*\*\*  
PARAMETER :  $L_{eq}$  1 hr. -  $L_{eq}$  12 hr. &  $L_{max}$  SAMPLE NO. : 40672  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322756 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{max}$	
08:00 - 09:00	78	83	dB(A)
09:00 - 10:00	78	83	dB(A)
10:00 - 11:00	77	81	dB(A)
11:00 - 12:00	78	86	dB(A)
12:00 - 13:00	77	81	dB(A)
13:00 - 14:00	78	83	dB(A)
14:00 - 15:00	77	86	dB(A)
15:00 - 16:00	77	81	dB(A)
16:00 - 17:00	77	83	dB(A)
17:00 - 18:00	79	86	dB(A)
18:00 - 19:00	77	82	dB(A)
19:00 - 20:00	78	81	dB(A)
$L_{eq}$ 12 hr. (TWA)	77*	81	dB(A)
Standard	$85^{1/2}$	$90^{1/2}$	dB(A)

REMARK : 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

<sup>1/1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

<sup>2/2</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

<sup>3/3</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

<sup>4/4</sup> Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

<sup>5/5</sup> Based on Criteria 90 dB(A); 5 dB Exchange Rate

<sup>6/6</sup> These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsepon

9. Ms. Thanaporn Klinsepon is Section Head / Mrs. Wanpen Lhaochindawat



APPROVED BY  
(MRS. WANPEN LHAOCHINDAWAT)

15/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : [marketing@etc1992.com](mailto:marketing@etc1992.com)



NSC-TIS-TIS 17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3251

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Siracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Steam Turbine No. 3\*\*\*  
PARAMETER :  $L_{eq}$  1 hr. -  $L_{eq}$  8 hr. &  $L_{max}$  SAMPLE NO. : 40668  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322750 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{eq}$ 8 hr.	
08:00 - 09:00	74	74	dB(A)
09:00 - 10:00	74	74	dB(A)
10:00 - 11:00	74	74	dB(A)
11:00 - 12:00	74	74	dB(A)
12:00 - 13:00	74	74	dB(A)
13:00 - 14:00	73	73	dB(A)
14:00 - 15:00	74	74	dB(A)
15:00 - 16:00	73	73	dB(A)
$L_{eq}$ 8 hr. (TWA)	73*	73**	dB(A)
Standard	$85^{1/2}$	$90^{1/2}$	dB(A)

REMARK 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

<sup>1/1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

<sup>2/2</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

<sup>3/3</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

<sup>4/4</sup> Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

<sup>5/5</sup> Based on Criteria 90 dB(A); 5 dB Exchange Rate

<sup>6/6</sup> These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsepon

9. Ms. Thanaporn Klinsepon is Section Head / Mrs. Wanpen Lhaochindawat



APPROVED BY  
(MRS. WANPEN LHAOCHINDAWAT)

15/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY





## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R1078  
Report No. R6810-3256

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Steam Turbine No. 3\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  12 hr. &  $L_{max}$  SAMPLE NO. : 40673  
DETERMINATION METHOD : ISO 11202:2010## MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322750 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{max}$	
08:00 - 09:00	74	76	dB(A)
09:00 - 10:00	74	76	dB(A)
10:00 - 11:00	74	76	dB(A)
11:00 - 12:00	74	82	dB(A)
12:00 - 13:00	74	87	dB(A)
13:00 - 14:00	73	74	dB(A)
14:00 - 15:00	74	81	dB(A)
15:00 - 16:00	73	75	dB(A)
16:00 - 17:00	74	74	dB(A)
17:00 - 18:00	74	76	dB(A)
18:00 - 19:00	75	77	dB(A)
19:00 - 20:00	74	75	dB(A)
$L_{eq}$ 12 hr. (TW/A)	73*	73**	dB(A)
Standard	$83^{\frac{1}{1}}$	$87^{\frac{2}{2}}$	$-140^{\frac{3}{3}} - 115^{\frac{3}{3}}$

REMARK : 1. ## ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area

Environment, Dated December 3, 2003, Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level  
That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels, Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

2. <sup>1</sup> Notification of The Department of Labor Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

3. <sup>2</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

4. <sup>3</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

5. \* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

6. \*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

7. \*\*\* These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsoon

9. Ms. Thanaporn Klinsoon is Section Head / Mrs. Wanpen Lhaochindawatt



Approved By : (MRS. WANPEN LHAOCHINDAWAT)

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

NSC-TISI-TIS 17025  
TESTING 1712

Request No. LA68-R1078  
Report No. R6810-3254

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 4\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  8 hr. &  $L_{max}$  SAMPLE NO. : 40671  
DETERMINATION METHOD : ISO 11202:2010## MEASURING DATE : 07/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00641701 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{eq}$ 8 hr.	
11:25 - 12:25	82	82	85
12:25 - 13:25	83	83	86
13:25 - 14:25	84	84	91
14:25 - 15:25	81	81	91
15:25 - 16:25	82	82	89
16:25 - 17:25	81	81	85
17:25 - 18:25	84	84	94
18:25 - 19:25	88	88	95
$L_{eq}$ 8 hr. (TW/A)	83*	83**	-
Standard	$85^{\frac{1}{1}}$	$90^{\frac{2}{2}}$	$-140^{\frac{3}{3}} - 115^{\frac{3}{3}}$

REMARK : 1. ## ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area  
Environment, Dated December 3, 2003, Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level  
That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels, Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

2. <sup>1</sup> Notification of The Department of Labor Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

3. <sup>2</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

4. <sup>3</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

5. \* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

6. \*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

7. \*\*\* These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsoon

9. Ms. Thanaporn Klinsoon is Section Head / Mrs. Wanpen Lhaochindawatt



Approved By : (MRS. WANPEN LHAOCHINDAWAT)

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY





## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TIS-TIS 17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3252

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 5\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  8 hr. &  $L_{max}$  SAMPLE NO. : 40669  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322746 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{max}$	
08:00 - 09:00	76	79	dB(A)
09:00 - 10:00	76	78	dB(A)
10:00 - 11:00	76	77	dB(A)
11:00 - 12:00	76	79	dB(A)
12:00 - 13:00	76	78	dB(A)
13:00 - 14:00	76	77	dB(A)
14:00 - 15:00	76	81	dB(A)
15:00 - 16:00	76	78	dB(A)
$L_{eq}$ 8 hr. (TWA)	75*	75**	dB(A)
Standard	85 <sup>1)</sup>	90 <sup>2)</sup>	dB(A)
- 140 <sup>3)</sup> - 115 <sup>3)</sup>			

REMARK 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area

Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of

Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

<sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

<sup>2)</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

<sup>3)</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

\* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

\*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

\*\*\* These Data are Non Laboratory Data

Measurement By Ms. Thanaporn Klinsoon



Approved By

วสันต์ ลิขิตกุลไพศาล 1992 จำกัด

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3875-3031-2 Fax: 0-3848-2095 E-mail: marketing@etc1992.com

NSC-TIS-TIS 17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3259

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 4\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  12 hr. &  $L_{max}$  SAMPLE NO. : 40676  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 07/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00641701 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{eq}$ 12 hr.	
11:25 - 12:25	82	85	dB(A)
12:25 - 13:25	83	83	dB(A)
13:25 - 14:25	84	84	dB(A)
14:25 - 15:25	81	81	dB(A)
15:25 - 16:25	82	82	dB(A)
16:25 - 17:25	81	81	dB(A)
17:25 - 18:25	84	84	dB(A)
18:25 - 19:25	88	88	dB(A)
19:25 - 20:25	81	81	dB(A)
20:25 - 21:25	81	81	dB(A)
21:25 - 22:25	81	81	dB(A)
22:25 - 23:25	81	81	dB(A)
$L_{eq}$ 12 hr. (TWA)	83*	82**	dB(A)
Standard	85 <sup>1)</sup>	87 <sup>2)</sup>	dB(A)
- 140 <sup>3)</sup> - 115 <sup>3)</sup>			

REMARK : 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area

Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of

Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

<sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

<sup>2)</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

<sup>3)</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

\* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

\*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

\*\*\* These Data are Non Laboratory Data

Measurement By Ms. Thanaporn Klinsoon

Ms. Thanaporn Klinsoon is Section Head / Ms.



Approved By

วสันต์ ลิขิตกุลไพศาล 1992 จำกัด

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com

ISO 9001 / ISO 14001



NSC-TIS-17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3257

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 5\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  12 hr. &  $L_{max}$  SAMPLE NO. : 40674  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 07/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322746 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{max}$	
08:00 - 09:00	76	79	dB(A)
09:00 - 10:00	76	78	dB(A)
10:00 - 11:00	76	77	dB(A)
11:00 - 12:00	76	79	dB(A)
12:00 - 13:00	76	78	dB(A)
13:00 - 14:00	76	77	dB(A)
14:00 - 15:00	76	81	dB(A)
15:00 - 16:00	76	78	dB(A)
16:00 - 17:00	76	78	dB(A)
17:00 - 18:00	77	79	dB(A)
18:00 - 19:00	77	79	dB(A)
19:00 - 20:00	74	78	dB(A)
$L_{eq}$ 12 hr. (TWA)	76*	76**	dB(A)
Standard	83 <sup>1)</sup>	87 <sup>2)</sup>	dB(A)

REMARK : 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed. Dated March 12, 2018

2. <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

3. <sup>2)</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

4. <sup>3)</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

5. \* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

6. \*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

7. \*\*\* These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsoon

9. Ms. Thanaporn Klinsoon is Section Head / Mrs. Wanpen Lhaochindawat



Approved By : (MRS. WANPEN LHAOCHINDAWAT)

วันที่ 15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



ISO 9001 / ISO 14001

## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197-8, 0-3876-3031-2 Fax : 0-3848-2095 E-mail : marketing@etc1992.com



NSC-TIS-17025  
TESTING 1712

Request No. LA68-R1078

Report No. R6810-3253

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 6\*\*\*  
PARAMETER :  $L_{eq}$  1 hr.,  $L_{eq}$  8 hr. &  $L_{max}$  SAMPLE NO. : 40670  
DETERMINATION METHOD : ISO 11202:2010# MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter RECEIVED DATE : 07/10/2025  
SN 00322752 : Class 2 REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{eq}$ 8 hr.	
08:00 - 09:00	78	78	dB(A)
09:00 - 10:00	77	77	dB(A)
10:00 - 11:00	77	77	dB(A)
11:00 - 12:00	77	77	dB(A)
12:00 - 13:00	78	78	dB(A)
13:00 - 14:00	77	77	dB(A)
14:00 - 15:00	76	76	dB(A)
15:00 - 16:00	77	77	dB(A)
$L_{eq}$ 8 hr. (TWA)	77*	77**	dB(A)
Standard	85 <sup>1)</sup>	90 <sup>2)</sup>	dB(A)

REMARK : 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area Environment. Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed. Dated March 12, 2018

2. <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)

(Published in the Government Gazette on January 26, 2018)

3. <sup>2)</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

4. <sup>3)</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)

5. \* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009

6. \*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

7. \*\*\* These Data are Non Laboratory Data

8. Measurement By Ms. Thanaporn Klinsoon

9. Ms. Thanaporn Klinsoon is Section Head / Mrs. Wanpen Lhaochindawat

Approved By : (MRS. WANPEN LHAOCHINDAWAT)

วันที่ 15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



Approved By : (MRS. WANPEN LHAOCHINDAWAT)

วันที่ 15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY







## EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
E-mail : marketing@etc1992.com



ISO 9001 / ISO 14001

Request No. LA68-R1078  
Report No. R6810-3258

NSC-TIS-TIS 17025  
TESTING 1712

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited\*\*\*  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230\*\*\*  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited\*\*\*  
SAMPLE POINT : Gas Turbine No. 6\*\*\*  
PARAMETER :  $L_{eq}$  1 hr,  $L_{eq}$  12 hr, &  $L_{max}$  : 40675  
DETERMINATION METHOD : ISO 11202:2010# : MEASURING DATE : 02/10/2025  
INSTRUMENT : Integrated Sound Level Meter : RECEIVED DATE : 07/10/2025  
SN 00322752 : Class 2 : REPORTED DATE : 15/10/2025

MEASURING TIME	RESULT		UNIT
	$L_{eq}$ 1 hr.	$L_{eq}$ 12 hr.	
08:00 - 09:00	78	78	dB(A)
09:00 - 10:00	77	77	dB(A)
10:00 - 11:00	77	77	dB(A)
11:00 - 12:00	77	77	dB(A)
12:00 - 13:00	78	78	dB(A)
13:00 - 14:00	77	77	dB(A)
14:00 - 15:00	76	76	dB(A)
15:00 - 16:00	77	77	dB(A)
16:00 - 17:00	76	76	dB(A)
17:00 - 18:00	75	75	dB(A)
18:00 - 19:00	75	75	dB(A)
19:00 - 20:00	76	76	dB(A)
$L_{max}$ 12 hr. (TWA)	76**	76**	dB(A)
Standard	83 <sup>1)</sup>	87 <sup>2)</sup>	dB(A)

REMARK : 1. # ISO 11202:2010, Notification of The Ministry of Industry B.E. 2546 (2003) on The Safety Protection Measures in Factory Regarding Working Area Environment, Dated December 3, 2003. Notification of The Department of Labor Protection and Welfare on The Standard of Noise Level

That Employees are Allowed to Receive in Average Period of Work Each Day, Dated January 26, 2018, Notification of The Department of Labor Protection and Welfare on Criteria, Measurement Methods, and Analysis of Working Conditions Regarding Heat, Light, or Noise Levels.

Including Duration and Types of Businesses to Be Performed, Dated March 12, 2018

<sup>1)</sup> Notification of The Department of Labor Protection and Welfare B.E. 2561 (2018)

<sup>2)</sup> Published in the Government Gazette on January 26, 2018)

<sup>3)</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

<sup>4)</sup> Regulation of The Ministry of Labor B.E. 2559 (2016)

<sup>5)</sup> \* Based on Criteria 85 dB(A); 3 dB Exchange Rate.

have License Registration of Department of Labor Protection and Welfare No. 0403-03-2564-0009

<sup>6)</sup> \*\* Based on Criteria 90 dB(A); 5 dB Exchange Rate

<sup>7)</sup> \*\*\* These Data are Non Laboratory Data

Measurement By Ms. Thanaporn Klinsoon

Ms. Thanaporn Klinsoon is Section Head / Mrs. Wanpen Lhaochindawat

Approved By : (MRS. WANPEN LHAOCHINDAWAT)

วันที่ 15/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FM-LAB-035/001-08-47

## บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.นงนุช อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
เว็บไซต์ : http://www.etc1992.com อีเมล : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1078  
Report No. R6810-3247

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : Area 1 (จุดสุ่มวัด สายไฟ 177)  
MEASURING DATE : 02/10/2025 : 40664  
RECEIVED DATE : 07/10/2025 : 07:10-19:10  
SAMPLING INSTRUMENT : Noise dosimeter : S/N CB0956 : 15/10/2025

PARAMETER*	RESULT	STANDARD	UNIT
Time weighted average level (12-hr TWA) <sup>#</sup>	78.1	83 <sup>1)</sup>	dB(A)
12 Hour dose	30.96	100 <sup>2)</sup>	%
Time weighted average level (8-hr TWA) <sup>#</sup>	79.9	85 <sup>1)</sup>	dB(A)

REMARK : <sup>1)</sup> Notification of The Department of Labor Protection and Welfare B.E. 2561 (2018)

<sup>2)</sup> Standard of National Institute for Occupational Safety and Health, Occupational Noise Exposure Revised Criteria 1998

<sup>#</sup> Based on Criteria 85 dB(A); 3 dB Exchange Rate

\* Parameter have License Registration of Department of Labor Protection and Welfare No. 0403-03-2564-0009 (Measurement By Ms. Thanaporn Klinsoon)



Approved By : (MRS. WANPEN LHAOCHINDAWAT)

วันที่ 15/10/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Page 1/1

FM-LAB-035/001-08-47

Request No. LA68-R1078

Report No. R6810-3248

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Siracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : Area 2 (จุดติดตั้งเครื่องจักร)  
MEASURING DATE : 02/10/2025  
RECEIVED DATE : 07/10/2025  
SAMPLING INSTRUMENT : Noise dosimeter : S/N CB0955

SAMPLE NO. : 40665

SAMPLING TIME : 07:10-19:10

REPORTED DATE : 15/10/2025

PARAMETER*	RESULT	STANDARD	UNIT
Time weighted average level (12-hr TWA) <sup>#</sup>	80.1	83 <sup>1/</sup>	dB(A)
12 Hour dose	48.98	100 <sup>2</sup>	%
Time weighted average level (8-hr TWA) <sup>#</sup>	81.9	85 <sup>1/</sup>	dB(A)

**REMARK :** <sup>1/</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)<sup>2</sup> Standard of National Institute for Occupational Safety and Health, Occupational Noise Exposure Revised Criteria 1998<sup>#</sup> Based on Criteria 85 dB(A) ; 3 dB Exchange Rate

- Parameter have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009  
(Measurement By Ms. Thanaiporn Klinsopton)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibarn 8 Rd., Nongkham, Siracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : Area 3 (จุดติดตั้งเครื่องจักร)  
MEASURING DATE : 02/10/2025  
RECEIVED DATE : 07/10/2025  
SAMPLING INSTRUMENT : Noise dosimeter : S/N CB0954

SAMPLE NO. : 40666

SAMPLING TIME : 07:10-19:10

REPORTED DATE : 15/10/2025

PARAMETER*	RESULT	STANDARD	UNIT
Time weighted average level (12-hr TWA) <sup>#</sup>	77.5	83 <sup>1/</sup>	dB(A)
12 Hour dose	26.98	100 <sup>2</sup>	%
Time weighted average level (8-hr TWA) <sup>#</sup>	79.3	85 <sup>1/</sup>	dB(A)

**REMARK :** <sup>1/</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018)<sup>2</sup> Standard of National Institute for Occupational Safety and Health, Occupational Noise Exposure Revised Criteria 1998<sup>#</sup> Based on Criteria 85 dB(A) ; 3 dB Exchange Rate

- Parameter have License Registration of Department of Labour Protection and Welfare No. 0403-03-2564-0009  
(Measurement By Ms. Thanaiporn Klinsopton)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

15/10/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY





Request No. LA68-R0562

Report No. R6805-2138

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapharm 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : Steam Turbine 2 SAMPLE NO. : 11252  
MEASURING DATE : 30/04/2025 RECEIVED DATE : 30/04/2025  
SAMPLING INSTRUMENT : Heat Stress ; REPORTED DATE : 16/05/2025

Wet Bulb Globe Temperature (WBGT) : Serial No. TPL090017

PARAMETER*	SAMPLING TIME					RESULT		
	NWB	GT	DB	WBGT	UNIT			
Heat Stress		09:30 - 10:00	27.8	34.5	34.2	29.8	°C	
		10:00 - 10:30	28.2	35.2	34.7	30.3	°C	
		10:30 - 11:00	28.0	35.7	35.3	30.3	°C	
		11:00 - 11:30	28.4	35.5	35.0	30.5	°C	
WBGT AVERAGE		09:30 - 11:30	-	-	-	30.2	°C	
STANDARD			-	-	-	34.0 <sup>1/2</sup>	°C	

REMARK:

Work Load is Light, Indoor

<sup>1/</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)<sup>2/</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

NWB = Natural Wet - Bulb Temperature

GT = Globe Temperature

DB = Dry - Bulb Temperature

WBGT = Wet - Bulb Globe Temperature

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0401-03-2564-0009  
(Measurement By Ms. Onanong Leewongsak)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

16/05/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapharm 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
SAMPLE POINT : Steam Turbine 3 SAMPLE NO. : 11253  
MEASURING DATE : 30/04/2025 RECEIVED DATE : 30/04/2025  
SAMPLING INSTRUMENT : Heat Stress ; REPORTED DATE : 16/05/2025

Wet Bulb Globe Temperature (WBGT) : Serial No. TPQ030024

PARAMETER*	SAMPLING TIME					RESULT		
	NWB	GT	DB	WBGT	UNIT			
Heat Stress		09:30 - 10:00	29.2	36.4	35.6	31.4	°C	
		10:00 - 10:30	29.4	36.1	35.2	31.4	°C	
		10:30 - 11:00	29.4	36.2	35.1	31.4	°C	
		11:00 - 11:30	29.3	36.3	35.2	31.4	°C	
WBGT AVERAGE		09:30 - 11:30	-	-	-	31.4	°C	
STANDARD			-	-	-	34.0 <sup>1/2</sup>	°C	

REMARK:

Work Load is Light, Indoor

<sup>1/</sup> Regulation of The Ministry of Labour B.E. 2559 (2016)<sup>2/</sup> Notification of The Ministry of Industry B.E. 2546 (2003)

NWB = Natural Wet - Bulb Temperature

GT = Globe Temperature

DB = Dry - Bulb Temperature

WBGT = Wet - Bulb Globe Temperature

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0401-03-2564-0009  
(Measurement By Ms. Onanong Leewongsak)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

16/05/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146  
Report No. R6811-1454 - R6811-1722

## TEST REPORT

CUSTOMER	: Ratch Pathana Energy Public Company Limited
ADDRESS	: 636 Moo 11 Sukphibam 8 Rd., Nongkham, Siracha, Chonburi 20230
SAMPLE SOURCE	: Ratch Pathana Energy Public Company Limited
MEASURING DATE	: 10/1/2025
RECEIVED DATE	: 10/1/2025
SAMPLING INSTRUMENT	: Illumination * Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างในห้องกลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
1. โต๊ะ Lobby รับแขก	10:00	817	<400-500	<400	LUX
2. โต๊ะทำงานเจ้าหน้าที่ธุรการ คุณณัฏฐ	10:00	462	<400-500	<400	LUX
3. โต๊ะทำงานเจ้าหน้าที่บัญชีและประสานงาน	10:00	498	<400-500	<400	LUX
คุณณิชาวรรณ					
4. โต๊ะทำงานหัวหน้าแผนกธุรการ คุณสุวิภา	10:01	566	<400-500	<400	LUX
5. โต๊ะทำงานผู้จัดการส่วนธุรการ คุณณัฏฐ	10:01	531	<400-500	<400	LUX
6. โต๊ะทำงานผู้จัดการส่วนจัดซื้อ จัดจ้าง คุณประยศ	10:01	483	<400-500	<400	LUX
7. โต๊ะทำงานหัวหน้าแผนกจัดซื้อ จัดจ้าง คุณปณิดา	10:02	554	<400-500	<400	LUX
8. โต๊ะทำงานวิศวกรจัดซื้อ จัดจ้าง คุณบุณยสิริกา	10:02	456	<400-500	<400	LUX
9. โต๊ะทำงานเจ้าหน้าที่ความปลอดภัย และสิ่งแวดล้อม	10:03	413	<400-500	<400	LUX
คุณศุภาติ					
10. โต๊ะทำงานเจ้าหน้าที่บริหารความเสี่ยง คุณณณารณ	10:03	496	<400-500	<400	LUX
11. โต๊ะทำงานผู้จัดการส่วนบริหารความเสี่ยง คุณอุบลนร	10:04	410	<400-500	<400	LUX
12. โต๊ะทำงานผู้จัดการส่วนบริหารระบบ คุณวิภากร	10:04	463	<400-500	<400	LUX
13. โต๊ะทำงานรักษาการหัวหน้าแผนกบริหารงานระบบ	10:04	594	<400-500	<400	LUX
คุณสุภาติ					
14. เครื่องถ่ายเอกสาร	10:05	514	<300-400	<300	LUX
15. ตู้วางของห้องถ่ายเอกสาร	10:05	432	<200-300	<200	LUX
16. โต๊ะทำงานวิศวกรพลังงานแสงอาทิตย์ คุณอัษฎายุทธ์	10:06	410	<400-500	<400	LUX
17. โต๊ะทำงานวิศวกรการติดตั้ง คุณธีรวิวัฒน์	10:06	470	<400-500	<400	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ramanee Nakke)



Approved By

(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER	: Ratch Pathana Energy Public Company Limited
ADDRESS	: 636 Moo 11 Sukphibam 8 Rd., Nongkham, Siracha, Chonburi 20230
SAMPLE SOURCE	: Ratch Pathana Energy Public Company Limited
MEASURING DATE	: 10/1/2025
RECEIVED DATE	: 10/1/2025
SAMPLING INSTRUMENT	: Illumination * Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างในห้องกลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
18. โต๊ะทำงานหัวหน้าแผนกพลังงานแสงอาทิตย์	10:07	484	<400-500	<400	LUX
19. โต๊ะทำงานรักษาการหัวหน้าแผนกคอมพิวเตอร์	10:07	614	<400-500	<400	LUX
คุณประยุทธิ์					
20. โต๊ะทำงานวิศวกรบริหารลูกค้า คุณสุภากร	10:08	555	<400-500	<400	LUX
21. โต๊ะทำงานวิศวกรบริหารเทคนิค คุณธีรวิวัฒน์	10:08	589	<400-500	<400	LUX
22. โต๊ะทำงานหัวหน้าแผนกดูแลรักษาและบริหารเทคนิค	10:08	553	<400-500	<400	LUX
คุณมาศยา					
23. โต๊ะทำงานผู้จัดการส่วนปฏิบัติการ คุณนิธราชันธุ์	10:09	466	<400-500	<400	LUX
24. โต๊ะทำงานวิศวกรโครงการ คุณธนพร	10:09	484	<400-500	<400	LUX
25. โต๊ะทำงานวิศวกร คุณดิเรก	10:09	515	<400-500	<400	LUX
26. โต๊ะทำงานเจ้าหน้าที่พัฒนาความสัมพันธ์ คุณศุภณัฐ	10:10	412	<400-500	<400	LUX
27. โต๊ะทำงานหัวหน้าแผนกพัฒนาความสัมพันธ์ คุณธนกร	10:10	423	<400-500	<400	LUX
28. โต๊ะทำงานวิศวกรระบบ คุณของกร	10:11	433	<400-500	<400	LUX
29. โต๊ะทำงานหัวหน้าแผนกวิศวกรรม และนวัตกรรม	10:11	468	<400-500	<400	LUX
คุณสุภาติ					
30. โต๊ะทำงานผู้จัดการส่วนวิศวกรรมและนวัตกรรม	10:12	648	<400-500	<400	LUX
คุณนันทนา					
31. โต๊ะทำงานผู้จัดการฝ่ายบริหารโรงไฟฟ้า อุทยานวังน	10:12	411	<400-500	<400	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ramanee Nakke)



Approved By

(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY





Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

**CUSTOMER** : Ratch Pathana Energy Public Company Limited  
**ADDRESS** : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
**SAMPLE SOURCE** : Ratch Pathana Energy Public Company Limited  
**MEASURING DATE** : 10/11/2025  
**RECEIVED DATE** : 10/11/2025  
**SAMPLING INSTRUMENT** : Illumination \* Lux Meter Serial No. R.032544, S.008890

**SAMPLE NO.** : 44661-44929  
**REPORTED DATE** : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางวัน</b>					
<b>Ratch Pathana Office : 1<sup>st</sup> Floor</b>					
32. โต๊ะทำงานผู้จัดการส่วนบริหาร โครงการ อุดมรัตน์	10:13	793	<400-500	<400	LUX
33. โต๊ะทำงาน Spare	10:13	714	<400-500	<400	LUX
34. โต๊ะทำงานหัวหน้าแผนกวางแผนโครงการ อุดมฤทธิ	10:14	597	<400-500	<400	LUX
35. โต๊ะทำงานผู้จัดการส่วนพลังงานแสงอาทิตย์ อุดมพรพงศ์	10:14	431	<400-500	<400	LUX
36. โต๊ะทำงานผู้จัดการฝ่ายโครงการและวิศวกรรม อุดมดำรง	10:15	533	<400-500	<400	LUX
37. โต๊ะทำงาน Spare	10:15	551	<400-500	<400	LUX


**REMARK :** <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramanee Nakkeet)



Approved By :   
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025  
 บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

**CUSTOMER** : Ratch Pathana Energy Public Company Limited  
**ADDRESS** : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
**SAMPLE SOURCE** : Ratch Pathana Energy Public Company Limited  
**MEASURING DATE** : 10/11/2025  
**RECEIVED DATE** : 10/11/2025  
**SAMPLING INSTRUMENT** : Illumination \* Lux Meter Serial No. R.032544, S.008890

**SAMPLE NO.** : 44661-44929  
**REPORTED DATE** : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางวัน</b>					
<b>Ratch Pathana Office : 2<sup>nd</sup> Floor</b>					
38. โต๊ะทำงานเจ้าหน้าที่บริหารทรัพยากรบุคคล อุดมวาทนา	10:42	460	<400-500	<400	LUX
39. โต๊ะทำงานผู้จัดการฝ่ายบริหารองค์กร อุดมฤทธิ	10:42	516	<400-500	<400	LUX
40. โต๊ะทำงานเจ้าหน้าที่แผนกทรัพยากรบุคคล อุดมฤทธิ	10:43	553	<400-500	<400	LUX
41. โต๊ะทำงานหัวหน้าแผนกพัฒนาทรัพยากรบุคคล อุดมวิทย์	10:43	475	<400-500	<400	LUX
42. โต๊ะทำงานหัวหน้าแผนกบริหารทรัพยากรบุคคล อุดมจันทร์	10:44	408	<400-500	<400	LUX
43. โต๊ะทำงาน Spare	10:44	485	<400-500	<400	LUX
44. โต๊ะทำงานเจ้าหน้าที่บัญชี (รับ-จ่าย) อุดมวรรณ	10:45	414	<400-500	<400	LUX
45. โต๊ะทำงานเจ้าหน้าที่บัญชี (รับ-จ่าย) อุดมพน	10:45	432	<400-500	<400	LUX
46. โต๊ะทำงานหัวหน้าแผนกบัญชีและการเงิน อุดมวรารัตน์	10:46	479	<400-500	<400	LUX
47. โต๊ะทำงานหัวหน้าแผนกบัญชีและภาษีอากร อุดมจอนใจ	10:46	556	<400-500	<400	LUX
48. โต๊ะทำงานเจ้าหน้าที่บัญชี อุดมไธทั	10:47	409	<400-500	<400	LUX
49. โต๊ะทำงานเจ้าหน้าที่บัญชี อุดมธดา	10:47	440	<400-500	<400	LUX
50. โต๊ะทำงานผู้จัดการส่วนบัญชี อุดมวิศา	10:48	446	<400-500	<400	LUX
51. โต๊ะทำงานหัวหน้าผู้จัดการฝ่ายบัญชีและการเงิน อุดมธัญวิ	10:49	423	<400-500	<400	LUX
52. โต๊ะทำงานรองกรรมการผู้จัดการสายการบริหารและการเงิน	10:49	404	<400-500	<400	LUX
<b>อุมฤทธิพงศ์</b>					
53. โต๊ะทำงานเจ้าหน้าที่ประสานงาน อุดมนัด	10:50	503	<400-500	<400	LUX
54. โต๊ะทำงานผู้จัดการส่วนงานเลขานุการบริษัท อุดมวราพร	10:50	589	<400-500	<400	LUX


**REMARK :** <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramanee Nakkeet)



Approved By :   
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025  
 บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146  
Report No. R6811-1454 - R6811-1722

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 656 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างภายในอาคาร</b>					
<b>Ratch Pathana Office : 2<sup>nd</sup> Floor</b>					
55. โต๊ะทำงานเจ้าหน้าที่ไม่ทราบประวัติ คุณวุฒิ	10:51	901	<400-500	<400	LUX
56. โต๊ะทำงานหัวหน้าแผนกโปรแกรมประยุกต์ คุณพจน์	10:51	776	<400-500	<400	LUX
57. โต๊ะทำงานผู้จัดการส่วนเทคโนโลยีสารสนเทศ คุณธีรศักดิ์	10:52	823	<400-500	<400	LUX
58. โต๊ะทำงานหัวหน้าแผนกเครือข่าย และระบบ IT	10:52	768	<400-500	<400	LUX
<b>คุณสุภาวดี</b>					
59. โต๊ะทำงานเจ้าหน้าที่กรรณ และระบบ IT คุณสุริยา	10:53	660	<400-500	<400	LUX
60. โต๊ะทำงานผู้จัดการฝ่ายรวมกิจการ และบริหารความเสี่ยง	10:53	658	<400-500	<400	LUX
<b>คุณเพ็ญทิพย์</b>					
61. ห้องกรรมการผู้จัดการ คุณถิรดา	10:54	513	<400-500	<400	LUX
62. โต๊ะทำงานที่ปรึกษาโครงการ คุณธีระยุทธ	10:54	503	<400-500	<400	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



Approved By: *วสน-วัน*  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 656 Moo 11 Sukhapibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างภายนอกอาคาร</b>					
<b>Ratch Pathana Office : 1<sup>st</sup> Floor</b>					
63. ห้องประชุมใหญ่ (ห้องหลัก)	10:20	849	-	<400	LUX
<b>- ห้องประชุมใหญ่ (ห้องหลัก) (แบ่งพื้นที่ห้องออกเป็น 2x2 ตารางเมตร)</b>					
จุดที่ 1	10:16	591	<150	-	LUX
จุดที่ 2	10:16	597	<150	-	LUX
จุดที่ 3	10:17	542	<150	-	LUX
จุดที่ 4	10:17	442	<150	-	LUX
จุดที่ 5	10:18	561	<150	-	LUX
จุดที่ 6	10:18	601	<150	-	LUX
จุดที่ 7	10:19	648	<150	-	LUX
จุดที่ 8	10:19	638	<150	-	LUX
ห้องประชุมใหญ่ (ห้องหลัก)	10:16 - 10:19	578	<300	-	LUX
<b>(แสงสว่างเฉลี่ย)</b>					

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



Approved By: *วสน-วัน*  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
64. ทางเดินหน้าห้องประชุมหลัก	10:25	163	-	<50	LUX
- ทางเดินหน้าห้องประชุมหลัก (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:22	151	<50	-	LUX
จุดที่ 2	10:22	158	<50	-	LUX
จุดที่ 3	10:23	133	<50	-	LUX
จุดที่ 4	10:23	140	<50	-	LUX
จุดที่ 5	10:24	163	<50	-	LUX
จุดที่ 6	10:24	318	<50	-	LUX
ทางเดินหน้าห้องประชุมหลัก (แสงสว่างเฉลี่ย)	10:22 - 10:24	177	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
65. ห้องประชุมเล็ก (พชาย)	10:29	549	-	<400	LUX
ห้องประชุมเล็ก (พชาย) (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:27	501	<150	-	LUX
จุดที่ 2	10:27	419	<150	-	LUX
จุดที่ 3	10:28	428	<150	-	LUX
จุดที่ 4	10:28	502	<150	-	LUX
ห้องประชุมเล็ก (พชาย) (แสงสว่างเฉลี่ย)	10:27 - 10:28	463	<300	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890



SAMPLE POINT	TIME	RESULT	STANDARD <sup>1/</sup>	STANDARD <sup>2/</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
66. ห้องเก็บเอกสารแผนกควบคุมการผลิต	10:34	437	-	<200	LUX
- ห้องเก็บเอกสารแผนกควบคุมการผลิต (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:31	390	<100	-	LUX
จุดที่ 2	10:31	480	<100	-	LUX
จุดที่ 3	10:32	465	<100	-	LUX
จุดที่ 4	10:32	481	<100	-	LUX
จุดที่ 5	10:33	480	<100	-	LUX
จุดที่ 6	10:33	590	<100	-	LUX
ห้องเก็บเอกสารแผนกควบคุมการผลิต (แสงสว่างเฉลี่ย)	10:31 - 10:33	481	<200	-	LUX

REMARK : <sup>1/</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2/</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ratanee Nakket)

  
 Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)  
 วันที่ อธิกรณ์พจนณัติ 1992 จำกัด 14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890



SAMPLE POINT	TIME	RESULT	STANDARD <sup>1/</sup>	STANDARD <sup>2/</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
67. ห้องอาหาร	10:38	405	-	<200	LUX
- ห้องอาหาร (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:36	390	<150	-	LUX
จุดที่ 2	10:36	444	<150	-	LUX
จุดที่ 3	10:37	418	<150	-	LUX
จุดที่ 4	10:37	534	<150	-	LUX
ห้องอาหาร (แสงสว่างเฉลี่ย)	10:36 - 10:37	447	<200	-	LUX

REMARK : <sup>1/</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2/</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ratanee Nakket)

  
 Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)  
 วันที่ อธิกรณ์พจนณัติ 1992 จำกัด 14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY





Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางวัน</b>					
<b>Ratch Pathana Office : 2<sup>nd</sup> Floor</b>					
68. ทางเดินบันได	10:40	290	—	<50	LUX
- ทางเดินบันได (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:39	183	<50	—	LUX
จุดที่ 2	10:39	201	<50	—	LUX
จุดที่ 3	10:40	290	<50	—	LUX
จุดที่ 4	10:40	247	<50	—	LUX
จุดที่ 5	10:41	173	<50	—	LUX
ทางเดินบันได (แสงสว่างเฉลี่ย)	10:39 - 10:41	219	<100	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ratanee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางวัน</b>					
<b>Ratch Pathana Office : 2<sup>nd</sup> Floor</b>					
69. ห้องประชุมใหญ่	10:58	815	—	<400	LUX
- ห้องประชุมใหญ่ (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	10:56	966	<150	—	LUX
จุดที่ 2	10:56	615	<150	—	LUX
จุดที่ 3	10:57	650	<150	—	LUX
จุดที่ 4	10:57	746	<150	—	LUX
ห้องประชุมใหญ่ (แสงสว่างเฉลี่ย)	10:56 - 10:57	744	<300	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ratanee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. LA68-R1146  
Report No. R681-I-1454 - R681-I-1722

### TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphitum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
Rach Pathana Office : 2 <sup>nd</sup> Floor					
70. ห้องเก็บเอกสารผู้ซื้อ	11:04	675	—	<200	LUX
- ห้องเก็บเอกสารผู้ซื้อ (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:00	266	<100	—	LUX
จุดที่ 2	11:00	389	<100	—	LUX
จุดที่ 3	11:01	292	<100	—	LUX
จุดที่ 4	11:01	229	<100	—	LUX
จุดที่ 5	11:02	669	<100	—	LUX
จุดที่ 6	11:02	677	<100	—	LUX
จุดที่ 7	11:03	661	<100	—	LUX
จุดที่ 8	11:03	618	<100	—	LUX
ห้องเก็บเอกสารผู้ซื้อ (แสงสว่างเฉลี่ย)	11:00 - 11:03	475	<200	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratamee Nakket)



วส- เพ็ญ  
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146  
Report No. R681-I-1454 - R681-I-1722

### TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphitum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
Rach Pathana Office : 2 <sup>nd</sup> Floor					
71. ห้องประชุมใหญ่ (ห้องประชุมหลัก)	11:11	658	—	<400	LUX
- ห้องประชุมใหญ่ (ห้องประชุมหลัก) (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:05	336	<150	—	LUX
จุดที่ 2	11:05	351	<150	—	LUX
จุดที่ 3	11:05	399	<150	—	LUX
จุดที่ 4	11:06	812	<150	—	LUX
จุดที่ 5	11:06	1,095	<150	—	LUX
จุดที่ 6	11:06	686	<150	—	LUX
จุดที่ 7	11:07	657	<150	—	LUX
จุดที่ 8	11:07	832	<150	—	LUX
จุดที่ 9	11:07	859	<150	—	LUX
จุดที่ 10	11:08	816	<150	—	LUX
จุดที่ 11	11:08	722	<150	—	LUX
จุดที่ 12	11:08	782	<150	—	LUX
จุดที่ 13	11:09	414	<150	—	LUX
จุดที่ 14	11:09	494	<150	—	LUX
จุดที่ 15	11:09	455	<150	—	LUX
จุดที่ 16	11:10	450	<150	—	LUX
จุดที่ 17	11:10	486	<150	—	LUX
จุดที่ 18	11:10	402	<150	—	LUX
ห้องประชุมใหญ่ (ห้องประชุมหลัก) (แสงสว่างเฉลี่ย)	11:05 - 11:10	614	<300	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratamee Nakket)



วส- เพ็ญ  
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

# TEST REPORT

CUSTOMER : Raich Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Raich Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากภายใน					
Raich Pathana Office : 2 <sup>nd</sup> Floor					
72. ทางเดินหนีห้องประชุมใหญ่	11:16	120	—	<50	LUX
- ทางเดินหนีห้องประชุมใหญ่ (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:13	142	<50	—	LUX
จุดที่ 2	11:13	139	<50	—	LUX
จุดที่ 3	11:14	192	<50	—	LUX
จุดที่ 4	11:14	144	<50	—	LUX
จุดที่ 5	11:15	358	<50	—	LUX
จุดที่ 6	11:15	344	<50	—	LUX
ทางเดินหนีห้องประชุมใหญ่ (แสงสว่างเฉลี่ย)	11:13 - 11:15	220	<100	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratmanee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

# TEST REPORT

CUSTOMER : Raich Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Raich Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากภายนอก					
Raich Pathana Office : 2 <sup>nd</sup> Floor					
73. ทางเดินหนีห้องประธาน	11:18	369	—	<50	LUX
- ทางเดินหนีห้องประธาน (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:17	271	<50	—	LUX
จุดที่ 2	11:17	251	<50	—	LUX
จุดที่ 3	11:18	369	<50	—	LUX
จุดที่ 4	11:18	291	<50	—	LUX
จุดที่ 5	11:19	256	<50	—	LUX
ทางเดินหนีห้องประธาน (แสงสว่างเฉลี่ย)	11:17 - 11:19	288	<100	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratmanee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างภายในอาคาร					
Ratch Pathana Office : 2 <sup>nd</sup> Floor					
74. ห้องประชุมหน้าห้อง IT	11:23	468	-	<400	LUX
- ห้องประชุมหน้าห้อง IT (แสงที่เพิ่งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:21	490	<150	-	LUX
จุดที่ 2	11:21	432	<150	-	LUX
จุดที่ 3	11:22	464	<150	-	LUX
จุดที่ 4	11:22	417	<150	-	LUX
ห้องประชุมหน้าห้อง IT (แสงสว่างเฉลี่ย)	11:21 - 11:22	451	<300	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratanee Nakket)



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphiban 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างภายในอาคาร					
Ratch Pathana Office : 2 <sup>nd</sup> Floor					
75. ทางเดินหน้าห้องประชุม (เพดาน)	11:27	262	-	<50	LUX
- ทางเดินหน้าห้องประชุม (เพดาน) (แสงที่เพิ่งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:24	415	<50	-	LUX
จุดที่ 2	11:24	205	<50	-	LUX
จุดที่ 3	11:25	112	<50	-	LUX
จุดที่ 4	11:25	251	<50	-	LUX
จุดที่ 5	11:26	299	<50	-	LUX
จุดที่ 6	11:26	315	<50	-	LUX
ทางเดินหน้าห้องประชุม (เพดาน) (แสงสว่างเฉลี่ย)	11:24 - 11:26	266	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratanee Nakket)



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 14/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office : 1 <sup>st</sup> Floor					
76. ห้องอบรม	11:31	831	—	<400	LUX
- ห้องอบรม (แบ่งพื้นที่ทั้งหมดออกเป็น 3x2 ตารางเมตร)					
จุดที่ 1	11:29	674	<150	—	LUX
จุดที่ 2	11:29	679	<150	—	LUX
จุดที่ 3	11:30	615	<150	—	LUX
จุดที่ 4	11:30	702	<150	—	LUX
ห้องอบรม (แสงสว่างเฉลี่ย)	11:29 - 11:30	668	<300	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakket)

Approved By:  (MRS. WANPEN LHAOCHINDAWAT)  
บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 14/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890


SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
Ratch Pathana Office					
- ห้องวิทยุ					
1. โต๊ะทำงาน No. 1	11:36	924	<400-500	<400	LUX
2. โต๊ะทำงาน No. 2	11:36	791	<400-500	<400	LUX
3. โต๊ะทำงาน No. 3	11:36	888	<400-500	<400	LUX
4. โต๊ะทำงาน No. 4	11:37	837	<400-500	<400	LUX
5. โต๊ะทำงาน No. 5	11:37	766	<400-500	<400	LUX
6. โต๊ะทำงาน No. 6	11:37	853	<400-500	<400	LUX
7. โต๊ะทำงาน No. 7	11:38	904	<400-500	<400	LUX
8. โต๊ะทำงาน No. 8	11:38	914	<400-500	<400	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakket)

Approved By:  (MRS. WANPEN LHAOCHINDAWAT)  
บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
<b>แสงสว่างจากหลอดไฟ</b>					
<b>OEG Office ชั้นล่าง</b>					
1. โต๊ะทำงาน EST (ข้าง)	09:45	474	<400-500	<400	LUX
2. โต๊ะทำงาน ตู้ไขว้ด้าน	09:45	477	<400-500	<400	LUX
3. โต๊ะทำงาน ตู้ลิ้นชัก	09:45	550	<400-500	<400	LUX
4. โต๊ะทำงาน ตู้เก็บกระดาษ	09:46	453	<400-500	<400	LUX
5. โต๊ะทำงาน ตู้ลิ้นชัก	09:46	448	<400-500	<400	LUX
6. โต๊ะทำงาน ตู้ลิ้นชัก	09:46	459	<400-500	<400	LUX
7. โต๊ะทำงาน ตู้ลิ้นชัก	09:47	504	<400-500	<400	LUX
8. เครื่องถ่ายเอกสาร	09:47	404	<300-400	<300	LUX
<b>ห้อง Server</b>					
9. หัวตู้ MAIN LAN SWITCH ตู้เหล็ก	09:48	387	<200-300	<200	LUX
<b>OEG Office ชั้น 2</b>					
10. โต๊ะทำงาน ตู้หวัด	09:50	467	<400-500	<400	LUX
11. โต๊ะทำงาน ตู้ลิ้นชัก	09:50	682	<400-500	<400	LUX
12. โต๊ะทำงาน (ข้าง)	09:50	440	<400-500	<400	LUX
13. โต๊ะทำงาน ตู้ลิ้นชัก	09:51	562	<400-500	<400	LUX
14. โต๊ะทำงาน ตู้ลิ้นชัก	09:51	636	<400-500	<400	LUX
15. โต๊ะทำงาน ตู้ลิ้นชัก	09:51	467	<400-500	<400	LUX
16. โต๊ะทำงาน ตู้ลิ้นชัก	09:52	612	<400-500	<400	LUX
17. โต๊ะทำงาน ตู้ลิ้นชัก	09:52	630	<400-500	<400	LUX
18. โต๊ะทำงาน ตู้ลิ้นชัก	09:53	516	<400-500	<400	LUX
19. โต๊ะทำงาน ตู้ลิ้นชัก	09:53	615	<400-500	<400	LUX

REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ratmanee Nakke)

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด  
14/11/2025  
MRS. WANPEN LHAOCHINDAWAT

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

### TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
<b>แสงสว่างจากหลอดไฟ</b>					
<b>OEG Office ชั้นล่าง</b>					
20. ห้องประชุม	09:57	557	-	<400	LUX
- ห้องประชุม (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	09:55	501	<150	-	LUX
จุดที่ 2	09:55	604	<150	-	LUX
จุดที่ 3	09:55	545	<150	-	LUX
จุดที่ 4	09:56	385	<150	-	LUX
จุดที่ 5	09:56	407	<150	-	LUX
จุดที่ 6	09:56	541	<150	-	LUX
จุดที่ 7	09:57	585	<150	-	LUX
จุดที่ 8	09:57	436	<150	-	LUX
ห้องประชุม (แสงสว่างเฉลี่ย)	09:55 - 09:57	501	<300	-	LUX

REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ratmanee Nakke)

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด  
14/11/2025  
MRS. WANPEN LHAOCHINDAWAT

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างแวดล้อมภายใน					
OEG Office ชั้น 2					
21. Document Room 1	10:00	418	-	<200	LUX
- Document Room 1 (พื้นที่ทั้งหมดยกเว้น 2x2 ตารางเมตร)					
จุดที่ 1	09:58	331	<150	-	LUX
จุดที่ 2	09:58	424	<150	-	LUX
จุดที่ 3	09:59	626	<150	-	LUX
จุดที่ 4	09:59	554	<150	-	LUX
Document Room 1 (แสงสว่างเฉลี่ย)	09:58 - 09:59	484	<200	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramaneek Nakke)

Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025  
 บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างแวดล้อมภายใน					
OEG Office ชั้น 2					
22. Document Room 2	10:04	503	-	<200	LUX
- Document Room 2 (พื้นที่ทั้งหมดยกเว้น 2x2 ตารางเมตร)					
จุดที่ 1	10:02	476	<150	-	LUX
จุดที่ 2	10:02	498	<150	-	LUX
จุดที่ 3	10:03	538	<150	-	LUX
จุดที่ 4	10:03	490	<150	-	LUX
Document Room 2 (แสงสว่างเฉลี่ย)	10:02 - 10:03	501	<200	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramaneek Nakke)

Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025  
 บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

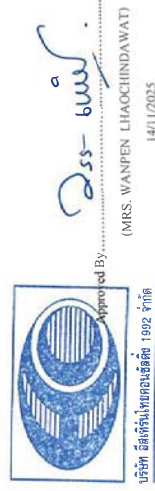
SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
แสงสว่างช่วงกลางคืน					
OEG Office ชั้น 2					
23. บันไดชั้น ชั้น 2 (บันไดที่หันออกถนน 2x2 ตารางเมตร)	10:06	298	-	<50	LUX
จุดที่ 1	10:05	178			LUX
จุดที่ 2	10:05	218		<50	LUX
จุดที่ 3	10:06	298		<50	LUX
จุดที่ 4	10:06	404		<50	LUX
จุดที่ 5	10:07	665		<50	LUX
บันไดชั้น ชั้น 2 (แสงสว่างเฉลี่ย)	10:05 - 10:07	353	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramee Nakke)



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

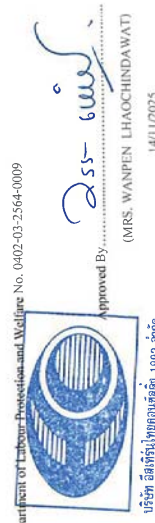
SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
แสงสว่างช่วงกลางคืน					
แสง Mechanical					
1. โต๊ะทำงาน ดูดฝุ่นวงจร	10:50	431	<400-500	<400	LUX
2. โต๊ะทำงาน ดูดถาวร	10:50	406	<400-500	<400	LUX
3. โต๊ะทำงาน ดูดเครื่อง	10:50	429	<400-500	<400	LUX
4. โต๊ะทำงานคอมพิวเตอร์ส่วนบุคคล	10:51	405	<400-500	<400	LUX
5. โต๊ะทำงาน Spare	10:51	406	<400-500	<400	LUX
6. โต๊ะทำงาน ดูดวงจร	10:51	414	<400-500	<400	LUX
แสง I&C					
7. โต๊ะทำงาน ดูดผงซักฟอก	10:52	410	<400-500	<400	LUX
8. เครื่องปรับอากาศ	10:52	367	<300-400	<300	LUX
9. โต๊ะทำงาน ดูดอากาศ	10:52	455	<400-500	<400	LUX
10. โต๊ะทำงาน ดูดกลิ่น	10:53	416	<400-500	<400	LUX
11. โต๊ะทำงาน ดูดหัวฉีด	10:53	796	<400-500	<400	LUX
แสง Electrical					
12. โต๊ะทำงาน ดูดพิษ	10:54	564	<400-500	<400	LUX
13. โต๊ะทำงาน ดูดไฟ	10:54	416	<400-500	<400	LUX
14. โต๊ะทำงาน ดูดอากาศ	10:54	480	<400-500	<400	LUX
15. โต๊ะทำงานคอมพิวเตอร์ส่วนบุคคล	10:55	416	<400-500	<400	LUX
16. โต๊ะทำงาน ดูดริ้วผ้า	10:55	516	<400-500	<400	LUX
แสง Store					
17. โต๊ะทำงาน ดูดถั่ว	10:56	437	<400-500	<400	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramee Nakke)



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146  
 Report No. R681-I-1454 - R681-I-1722

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

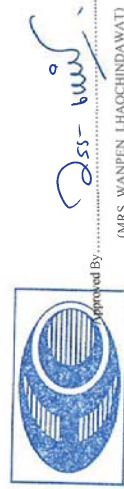
SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างตามสถานที่					
Work Shop ชั้น 2					
18. Document Room 3 (โรงพิมพ์)	10:58	295	—	<200	LUX
จุดที่ 1	10:57	390	<150	—	LUX
จุดที่ 2	10:57	383	<150	—	LUX
จุดที่ 3	10:58	227	<150	—	LUX
จุดที่ 4	10:58	236	<150	—	LUX
Document Room 3 (แสงสว่างเฉลี่ย)	10:57 - 10:58	309	<300	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างตามสถานที่					
Store					
19. ห้องเก็บ Spare Part	10:59	238	—	<200	LUX
จุดที่ 1		238	<100	—	LUX
จุดที่ 2		249	<100	—	LUX
จุดที่ 3		307	<100	—	LUX
จุดที่ 4		285	<100	—	LUX
R (ค่าเฉลี่ย r-1 ถึง r-4)		270	—	—	LUX
จุดที่ 1		274	<100	—	LUX
จุดที่ 2		278	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-2)		276	—	—	LUX
จุดที่ 1		272	<100	—	LUX
จุดที่ 2		659	<100	—	LUX
T (ค่าเฉลี่ย t-1 ถึง t-2)		466	—	—	LUX
จุดที่ 1		343	<100	—	LUX
จุดที่ 2		3,087	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		1,715	—	—	LUX
แสงสว่างเฉลี่ย		1,818	<200	—	LUX
ความกว้างของห้อง (W) = 4.80 เมตร	10:59 - 11:01	ความยาวของห้อง (L) = 11.80 เมตร			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Ramanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
 (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากภายนอก					
Store					
20. Store เก็บของชั้นล่างห้องแอร์	11:05	403	-	<200	LUX
- Store เก็บของชั้นล่างห้องแอร์ (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:02	1,804	<100	-	LUX
จุดที่ 2	11:02	735	<100	-	LUX
จุดที่ 3	11:02	531	<100	-	LUX
จุดที่ 4	11:02	513	<100	-	LUX
จุดที่ 5	11:03	551	<100	-	LUX
จุดที่ 6	11:03	410	<100	-	LUX
จุดที่ 7	11:03	311	<100	-	LUX
จุดที่ 8	11:04	317	<100	-	LUX
จุดที่ 9	11:04	402	<100	-	LUX
จุดที่ 10	11:04	366	<100	-	LUX
Store เก็บของชั้นล่างห้องแอร์ (แสงสว่างเฉลี่ย)	11:02 - 11:04	594	<200	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakket)



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากภายนอก					
Store ชั้น 2					
21. Store	11:08	285	-	<200	LUX
- Store (หลอดไฟมีระยะห่างระหว่างหลอดทั่วทั้งและสีจำนวนแสงทั่ว 2 เมตร)					
- r-1		256	<100	-	LUX
- r-2		277	<100	-	LUX
- r-3		292	<100	-	LUX
- r-4		258	<100	-	LUX
- r-5		215	<100	-	LUX
- r-6		223	<100	-	LUX
- r-7		484	<100	-	LUX
- r-8		285	<100	-	LUX
R (ค่าเฉลี่ย r-1 ถึง r-8)		286	-	-	LUX
- q-1		321	<100	-	LUX
- q-2		316	<100	-	LUX
- q-3		225	<100	-	LUX
- q-4		216	<100	-	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-4)		270	-	-	LUX
- p-1		279	<100	-	LUX
- p-2		217	<100	-	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		248	-	-	LUX
- t-1		572	<100	-	LUX
- t-2		558	<100	-	LUX
- t-3		328	<100	-	LUX
- t-4		309	<100	-	LUX
T (ค่าเฉลี่ย t-1 ถึง t-4) แสงสว่างเฉลี่ย	11:06 - 11:11	442	-	<200	LUX
Store ชั้น 2		305	-	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),  
Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakket)



Approved By :  
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Request No. LA68-R1146

Report No. R681-I-1454 - R681-I-1722

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929

REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
แสงสว่างในห้องทำงาน					
ห้องทำงานนักเคมี					
1. โต๊ะทำงาน นักเคมี	10:41	441	<400-500	<400	LUX
ห้อง Lab					
2. หน้า Hood นักเคมี	10:42	417	<400-500	<400	LUX
3. โต๊ะปฏิบัติการวิเคราะห์ นักเคมี	10:42	407	<400-500	<400	LUX
ห้อง CCR ค่า					
4. โต๊ะคอมพิวเตอร์ No. 1 คูณพหุคูณ	10:43	441	<400-500	<400	LUX
5. โต๊ะคอมพิวเตอร์ No. 2 คูณพหุคูณ	10:43	493	<400-500	<400	LUX
6. โต๊ะคอมพิวเตอร์ No. 3 คูณพหุคูณ	10:43	678	<400-500	<400	LUX
อาคาร 115 KV. Substation					
7. หน้าตู้ Panel-1 115 KV Line to AO-PHAI คูณพหุคูณ	10:44	301	<200-300	<200	LUX
8. หน้าตู้ 3YB-02 RELAY AND CONTROL PANEL คูณพหุคูณ	10:44	355	<200-300	<200	LUX
BOP #3					
- ห้อง MCC GTS					
9. หน้าตู้ Control SA01 415V STG MCC คูณพหุคูณ	10:45	655	<200-300	<200	LUX
10. หน้าตู้ Control Direct Feeder + VT + ES คูณพหุคูณ	10:45	566	<200-300	<200	LUX
11. หน้าตู้ Control SA01 415 GTG MCC SA01 คูณพหุคูณ	10:45	751	<200-300	<200	LUX
12. หน้าตู้ Control SA01 415V Essential Switchgear คูณพหุคูณ	10:46	456	<200-300	<200	LUX
13. หน้าตู้ Control Out going to CT Generator คูณพหุคูณ	10:46	566	<200-300	<200	LUX
14. หน้าตู้ Control Out going to ST Generator คูณพหุคูณ	10:46	606	<200-300	<200	LUX

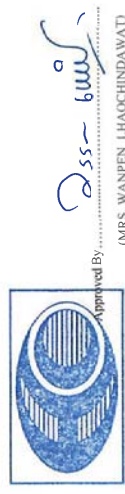
REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ratanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929

REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
แสงสว่างในห้องทำงาน					
BOP #3					
- ห้อง LCR 3					
15. หน้าตู้ Control AVR Panel คูณพหุคูณ	10:47	910	<200-300	<200	LUX
16. หน้าตู้ Control Turbine Control Cubicle คูณพหุคูณ	10:47	811	<200-300	<200	LUX
17. หน้าตู้ Control Synchronizing Panel คูณพหุคูณ	10:47	762	<200-300	<200	LUX
18. หน้าตู้ Control UPS Panel คูณพหุคูณ	10:48	634	<200-300	<200	LUX
19. หน้าตู้ Control 125 DVC Battery Charger #1 คูณพหุคูณ	10:48	674	<200-300	<200	LUX
20. โต๊ะคอมพิวเตอร์ (Monitor CEMs) คูณพหุคูณ	10:49	781	<400-500	<400	LUX
21. โต๊ะคอมพิวเตอร์ คูณพหุคูณ	10:49	679	<400-500	<400	LUX
BOP #2					
- ห้อง LCR 2					
22. โต๊ะคอมพิวเตอร์ Control Panel DCS คูณพหุคูณ	10:50	522	<400-500	<400	LUX
23. โต๊ะคอมพิวเตอร์ GTM4 คูณพหุคูณ	10:50	520	<400-500	<400	LUX
- อาคาร 22 KV. Substation 1					
24. หน้าตู้ INC 2 คูณพหุคูณ	10:51	310	<200-300	<200	LUX
25. หน้าตู้ BS คูณพหุคูณ	10:51	387	<200-300	<200	LUX
26. หน้าตู้ INCOMING 1 คูณพหุคูณ	10:51	375	<200-300	<200	LUX
27. หน้าตู้ 04 OUT GOING F15 คูณพหุคูณ	10:52	352	<200-300	<200	LUX
28. หน้าตู้ 04 OUT GOING F13 คูณพหุคูณ	10:52	328	<200-300	<200	LUX

REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ratanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

# TEST REPORT

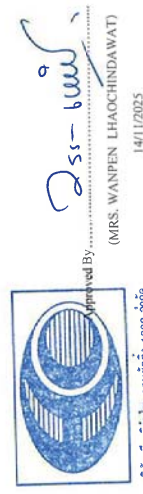
CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างรวมจากกลางวัน</b>					
<b>BOP #2</b>					
- อพาร์ต 22 kV, Substation 2					
29. หน้าตู้ Out Going Feeder No.6 ถัดตู้ไปรษณีย์	10:53	250	<200-300	<200	LUX
30. หน้าตู้ Out Going Feeder No.8 ถัดตู้ไปรษณีย์	10:53	214	<200-300	<200	LUX
31. หน้าตู้ Out Going Feeder No.10 ถัดตู้ไปรษณีย์	10:54	235	<200-300	<200	LUX
32. หน้าตู้ Out Going Feeder No.17 ถัดตู้ไปรษณีย์	10:54	226	<200-300	<200	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),  
 Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakke)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

# TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างจากกลางวัน</b>					
<b>33. MCC Switchgear ห้อง CCR</b>					
- MCC Switchgear ห้อง CCR (หลอดไฟระหว่างหลอดที่ 1 และ 2 จำนวนหลอด 2 ดวง)	10:57	507	-	<200	LUX
* r-1		382	<100	-	LUX
* r-2		701	<100	-	LUX
* r-3		643	<100	-	LUX
* r-4		562	<100	-	LUX
* r-5		459	<100	-	LUX
* r-6		478	<100	-	LUX
* r-7		631	<100	-	LUX
* r-8		507	<100	-	LUX
<b>R (ค่าเฉลี่ย r-1 ถึง r-8)</b>					
* q-1		545	<100	-	LUX
* q-2		553	<100	-	LUX
* q-3		482	<100	-	LUX
* q-4		567	<100	-	LUX
<b>Q (ค่าเฉลี่ย q-1 ถึง q-4)</b>					
* p-1		532	<100	-	LUX
* p-2		563	<100	-	LUX
* p-3		586	<100	-	LUX
* p-4		575	<100	-	LUX
* p-5		581	<100	-	LUX
* p-6		743	<100	-	LUX
* p-7		493	<100	-	LUX
* p-8		419	<100	-	LUX
<b>T (ค่าเฉลี่ย p-1 ถึง p-8)</b>					
* t-1		559	<100	-	LUX
* t-2		546	<200	-	LUX
<b>แสงสว่างเฉลี่ย</b>					
10:55 - 11:04		546	<200	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),  
 Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakke)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY



บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



683 หมู่ 11 ต.สุขสำราญ อ.ศรีราชา จ.ชลบุรี 20230  
โทร: 0-3848-1197, 0-3876-3031-2 แฟกซ์: 0-3848-2095  
เว็บไซต์: http://www.etc1992.com E-mail: info@etc1992.com

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด



683 หมู่ 11 ต.สุขสำราญ อ.ศรีราชา จ.ชลบุรี 20230  
โทร: 0-3848-1197, 0-3876-3031-2 แฟกซ์: 0-3848-2095  
เว็บไซต์: http://www.etc1992.com E-mail: info@etc1992.com

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
LCR #2					
34. MCC LCR #2	11:06	318	—	<200	LUX
* MCC LCR #2 (หลอดไฟติดตั้งบนอาคารห้อง)					
- q-1		225	<100	—	LUX
- q-2		285	<100	—	LUX
- q-3		318	<100	—	LUX
- q-4		215	<100	—	LUX
- q-5		230	<100	—	LUX
- q-6		314	<100	—	LUX
- q-7		239	<100	—	LUX
- q-8		229	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)					
- p-1		304	<100	—	LUX
- p-2		260	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)					
แสงสว่างเฉลี่ย	11:05 - 11:09	282	—	—	LUX
จำนวนหลอดไฟ (N) = 4	หลอด	263	<200	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Rattamee Nikkiet)



Approved By:

(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
อาคาร Chiller					
35. ทางเดิน Chiller No. 1	11:11	326	—	<50	LUX
- ทางเดิน Chiller No. 1 (พื้นที่ทั้งหมดอยู่ใน 2.2 ตารางเมตร)					
จุดที่ 1	11:10	112	<50	—	LUX
จุดที่ 2	11:10	202	<50	—	LUX
จุดที่ 3	11:11	292	<50	—	LUX
จุดที่ 4	11:11	326	<50	—	LUX
จุดที่ 5	11:12	293	<50	—	LUX
จุดที่ 6	11:12	540	<50	—	LUX
จุดที่ 7	11:13	843	<50	—	LUX
ทางเดิน Chiller No. 1 (แสงสว่างเฉลี่ย)	11:10 - 11:13	373	<100	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Rattamee Nikkiet)



Approved By:

(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

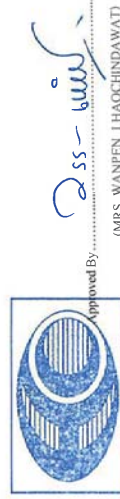
SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
อาคาร Chiller					
36. ทาสี Chiller No. 4	11:15	249	-	<50	LUX
- ทาสี Chiller No. 4 (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:14	105	<50	-	LUX
จุดที่ 2	11:14	134	<50	-	LUX
จุดที่ 3	11:15	255	<50	-	LUX
จุดที่ 4	11:15	249	<50	-	LUX
จุดที่ 5	11:16	220	<50	-	LUX
จุดที่ 6	11:16	558	<50	-	LUX
จุดที่ 7	11:17	895	<50	-	LUX
ทาสี Chiller No. 4 (แสงสว่างเฉลี่ย)	11:14 - 11:17	345	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
14/11/2025  
(MRS. WANPEN LHAOCHINDAWAT)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางวัน					
ห้องประชุม 9					
37. ห้องประชุม 9	11:19	654	-	<100	LUX
- ห้องประชุม 9 (แบ่งพื้นที่ทั้งหมดออกเป็น 2x2 ตารางเมตร)					
จุดที่ 1	11:18	886	-	-	LUX
จุดที่ 2	11:19	1,153	-	-	LUX
ห้องประชุม 9 (แสงสว่างเฉลี่ย)	11:18 - 11:19	1,020	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
14/11/2025  
(MRS. WANPEN LHAOCHINDAWAT)

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER	✖	Ratch Pathana Energy Public Company Limited
ADDRESS	✖	636 Moo 11 Sukdapham 8 Rd., Nongkham, Sriracha, Chonburi 20230
SAMPLE SOURCE	✖	Ratch Pathana Energy Public Company Limited
MEASURING DATE	✖	10/11/2025
RECEIVED DATE	✖	10/11/2025
SAMPLING INSTRUMENT	✖	Illumination * Lux Meter Serial No. R.03254, S.00890

SALES POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แขวงวังสภานุขจร</b>					
<b>ห้อง New CCR ชั้น 3</b>					
1. โถงทำงาน 1 ชุดไฮดรอล	11:21	705	<400-500	<400	LUX
2. โถงทำงาน 2 ชุดไฮดรอล	11:21	716	<400-500	<400	LUX
3. โถงทำงาน 3 ชุดไฮดรอล	11:21	702	<400-500	<400	LUX
4. โถงทำงาน 4 ชุดไฮดรอล	11:22	756	<400-500	<400	LUX
5. โถงทำงาน 5 ชุดไฮดรอล	11:22	771	<400-500	<400	LUX
6. โถงทำงาน 6 ชุดไฮดรอล	11:22	765	<400-500	<400	LUX
7. โถงทำงาน 7 ชุดไฮดรอล	11:23	883	<400-500	<400	LUX
8. โถงทำงาน 8 ชุดไฮดรอล	11:23	892	<400-500	<400	LUX
9. โถงทำงาน 9 ชุดไฮดรอล	11:23	802	<400-500	<400	LUX
10. โถงทำงาน 10 ชุดไฮดรอล	11:24	900	<400-500	<400	LUX
11. โถงทำงาน 11 ชุดไฮดรอล	11:24	705	<400-500	<400	LUX
12. โถงทำงาน 12 ชุดไฮดรอล	11:24	760	<400-500	<400	LUX
13. โถงทำงาน 13 ชุดไฮดรอล					
- พื้นที่ 1	11:25	1,768	<400-500	<400	LUX
- พื้นที่ 2	11:25	3,150	<300	-	LUX
- พื้นที่ 3	11:25	4,200	<200	-	LUX
14. โถงทำงาน 14 ชุดไฮดรอล					
- พื้นที่ 1	11:26	3,860	<400-500	<400	LUX
- พื้นที่ 2	11:26	2,699	<600	-	LUX
- พื้นที่ 3	11:26	1,488	<300	<300	LUX

<sup>1/1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

## illumination Standard

<sup>12</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms Ratmanee Nakket)



## Annexes

(MRS WANPEN LIAOCHINDAWAT)

14/11/2025

บริษัท ดิสเคิชั่นไทยคอมมูนิตี้ 1092 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL, LABORATORY

## TEST REPORT

CUSTOMER	: Rach Pathana Energy, Public Company Limited
ADDRESS	: 634 Moo 11 Sukthapham 8 Rd., Nongkham, Srisachan, Chonburi 20730
SAMPLE SOURCE	: Rach Pathana Energy, Public Company Limited
MEASURING DATE	: 10/11/2025
RECEIVED DATE	: 10/11/2025
SAMPLING INSTRUMENT	: Illumination *: Lux Meter Serial No. R.032544, S.00890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสดงช่วงเวลาที่จริง</b>					
<b>ห้อง New MCC ชั้น 3</b>					
15. หนังสือ UNM Panel ชุดไอซูยซ์	11:27	513	<200-300	<200	LUX
16. หนังสือ 115KV. Control and Protection LRP 5-3 61GE/03A	11:27	442	<200-300	<200	LUX
<b>ชุด ไอซูยซ์</b>					
17. หนังสือ 115KV Control and Protection LRP 5-2 61GE/03 B	11:27	454	<200-300	<200	LUX
<b>ชุด ไอซูยซ์</b>					
18. หนังสือ STG-3 GSUT RTCC PANEL 61GE/02A	11:28	543	<200-300	<200	LUX
<b>ชุด ไอซูยซ์</b>					
19. หนังสือ GTG-5 GSUT RTCC BANEL 616 EI01A	11:28	654	<200-300	<200	LUX
<b>ชุด ไอซูยซ์</b>					
20. หนังสือ (GCC-0) Process STEAM FLOW Computer ชุด ไอซูยซ์	11:29	1,181	<200-300	<200	LUX
- พื้นที่ 1		1,883	<300	-	LUX
- พื้นที่ 2		1,548	<200	-	LUX
- พื้นที่ 3	11:29				
<b>ห้อง STG #3 ชั้น 1</b>					
21. 62 NAA 10GA030 ชุดแผงวัด	11:30	210	<200-300	<100	LUX
22. 6PT1502 ชุดแผงวัด	11:30	298	<200-300	<100	LUX

DEMAND : // Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018).

### Illumination Standard

12 Nationalization of Industries of India, P E 2546 (2003)

4. Research Institute for the Future: Prediction of Demographic and Welfare No. 0402-03-2564-0009

(Manufactured By: Mc Patmanee Nakket)



(MRS. WANPEN LHAOCHINDAWAT)

บริษัท อีสเทิร์นไทยคอนกรีต จำกัด

14/11/2025

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY

THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL

WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146  
 Report No. R681-I-454- R681-I-722

# TEST REPORT

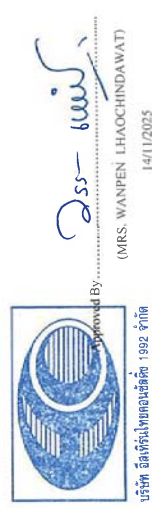
CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างรวมกลางวัน					
New MCC ชั้น 3	11:31	526	—	<400	LUX
23. ห้องประชุม					
- ห้องประชุม (หลอดไฟที่กระจายแสงตาม)					
- r-1		526	<150	—	LUX
- r-2		896	<150	—	LUX
- r-3		484	<150	—	LUX
- r-4		702	<150	—	LUX
R (ค่าเฉลี่ย r-1 ถึง r-4)		652	—	—	LUX
- q-1		2,792	<150	—	LUX
- q-2		740	<150	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-2)		1,766	—	—	LUX
- t-1		809	<150	—	LUX
- t-2		859	<150	—	LUX
T (ค่าเฉลี่ย t-1 ถึง t-2)		834	—	—	LUX
- p-1		2,213	<150	—	LUX
- p-2		755	<150	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		1,484	—	—	LUX
แสงสว่างเฉลี่ย		1,674	<300	—	LUX
ความกว้างของห้อง (W) = 7.00 เมตร	ความยาวของห้อง (L) = 11.10 เมตร				

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

# TEST REPORT

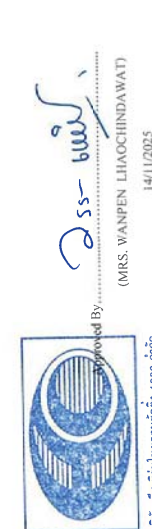
CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างรวมกลางวัน					
New MCC ชั้น 2	11:38	258	—	<200	LUX
24. NEW MCC (1) (หลอดไฟที่ติดตั้งตามหลังห้อง)					
- q-1		329	<100	—	LUX
- q-2		369	<100	—	LUX
- q-3		229	<100	—	LUX
- q-4		312	<100	—	LUX
- q-5		258	<100	—	LUX
- q-6		309	<100	—	LUX
- q-7		414	<100	—	LUX
- q-8		426	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		331	—	—	LUX
- p-1		337	<100	—	LUX
- p-2		437	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		387	—	—	LUX
แสงสว่างเฉลี่ย	11:36 - 11:40	342	<200	—	LUX
จำนวนหลอดไฟ (N) = 5 หลอด					

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
New MCC ชั้น 2					
25. New MCC (2)	11:42	376	—	<200	LUX
- New MCC (2) (หลอดไฟติดตั้งแนวเดียวกันห้อง)					
- q-1		397	<100	—	LUX
- q-2		403	<100	—	LUX
- q-3		376	<100	—	LUX
- q-4		286	<100	—	LUX
- q-5		320	<100	—	LUX
- q-6		317	<100	—	LUX
- q-7		423	<100	—	LUX
- q-8		519	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		380	—	—	LUX
- p-1		436	<100	—	LUX
- p-2		438	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		437	—	—	LUX
แสงสว่างเฉลี่ย	11:41 - 11:45	392	<200	—	LUX
จำนวนหลอดไฟ (N) =	5	หลอด			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Rattanaee Nakket)



14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhaphum 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
New MCC ชั้น 2					
26. New MCC (3)	11:48	215	—	<200	LUX
- New MCC (3) (หลอดไฟติดตั้งแนวเดียวกันห้อง)					
- q-1		308	<100	—	LUX
- q-2		252	<100	—	LUX
- q-3		208	<100	—	LUX
- q-4		288	<100	—	LUX
- q-5		215	<100	—	LUX
- q-6		207	<100	—	LUX
- q-7		333	<100	—	LUX
- q-8		386	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		275	—	—	LUX
- p-1		370	<100	—	LUX
- p-2		424	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		397	—	—	LUX
แสงสว่างเฉลี่ย	11:46 - 11:50	299	<200	—	LUX
จำนวนหลอดไฟ (N) =	5	หลอด			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Rattanaee Nakket)



14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Request No. LA68-R1146

Report No. R6811-1454- R6811-1722

# TEST REPORT

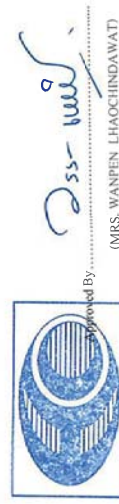
CUSTOMER : Rach Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

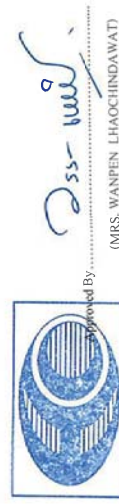
SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากหลอดวัน					
New MCC ชั้น 2	11:51	267	—	<200	LUX
27. ห้องประชุม (หลอดไฟดาวน์ไลท์)					
* r-1		267	<100	—	LUX
* r-2		317	<100	—	LUX
* r-3		300	<100	—	LUX
* r-4		251	<100	—	LUX
R (ค่าเฉลี่ย r-1 ถึง r-4)					
* q-1		250	<100	—	LUX
* q-2		233	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-2)					
* t-1		242	—	—	LUX
* t-2		298	<100	—	LUX
T (ค่าเฉลี่ย t-1 ถึง t-2)					
* p-1		311	<100	—	LUX
* p-2		305	—	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)					
* p-2		296	<100	—	LUX
แสงสว่างเฉลี่ย					
* p-2		329	<100	—	LUX
ความกว้างของห้อง (W) = 6.10 เมตร ความยาวของห้อง (L) = 9.50 เมตร					
แสงสว่างเฉลี่ย					
* p-2		313	—	—	LUX
แสงสว่างเฉลี่ย					
* p-2		301	<200	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



Approved By :  (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

# TEST REPORT

CUSTOMER : Rach Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Rach Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างจากหลอดวัน					
New MCC ชั้น 1	12:00	417	—	<200	LUX
28. ห้องเก็บสารเคมี (แสงสว่างจากหลอดวัน 2x2 ตารางเมตร)					
* จุดที่ 1		1,090	<100	—	LUX
* จุดที่ 2		526	<100	—	LUX
* จุดที่ 3		442	<100	—	LUX
* จุดที่ 4		367	<100	—	LUX
* จุดที่ 5		643	<100	—	LUX
* จุดที่ 6		440	<100	—	LUX
* จุดที่ 7		609	<100	—	LUX
* จุดที่ 8		3,983	<100	—	LUX
* จุดที่ 9		429	<100	—	LUX
* จุดที่ 10		659	<100	—	LUX
* จุดที่ 11		416	<100	—	LUX
* จุดที่ 12		389	<100	—	LUX
ห้องเก็บสารเคมี (แสงสว่างเฉลี่ย)					
11:56 - 11:59					
833					

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



Approved By :  (MRS. WANPEN LHAOCHINDAWAT)  
 14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 ต.สุขาภิบาล 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
 683 Moo 11 Sukhaphibam 8 Rd., Nongpram, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 หมู่ 11 ต.สุกาภิบาล 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
 683 Moo 11 Sukhaphibam 8 Rd., Nongpram, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongklum, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
 REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
<b>แสงสว่างจากหลอดกิน</b>					
<b>GT #6</b>					
1. Chemical Skid HRSG #6	19:12	377	<200-300	<100	LUX
2. Air-Compressor #2	19:13	728	<200-300	<100	LUX
3. Duck Burner	19:14	238	<200-300	<100	LUX
4. Sample Cool Analysis	19:15	240	<200-300	<100	LUX
5. Gas Heater 601-M103	19:16	220	<200-300	<100	LUX
6. HP Feed Water Pump HASG 6	19:17	352	<200-300	<100	LUX
7. LP Feed Water Pump HASG 7	19:18	316	<200-300	<100	LUX
8. HP Boiler HRGS #6	19:19	249	<200-300	<100	LUX
9. LP Boiler HRGS #6	19:20	235	<200-300	<100	LUX

REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),  
 Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Rattamee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 ต.สุกาภิบาล 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
 683 Moo 11 Sukhaphibam 8 Rd., Nongpram, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
 683 หมู่ 11 ต.สุกาภิบาล 8 ต.หนองปรือ อ.ศรีราชา จ.ชลบุรี 20230  
 683 Moo 11 Sukhaphibam 8 Rd., Nongpram, Sriracha, Chonburi 20230  
 Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
 Website : http://www.etc1992.com E-mail : info@etc1992.com

Request No. LA68-R1146  
 Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
 ADDRESS : 636 Moo 11 Sukhaphibam 8 Rd., Nongklum, Sriracha, Chonburi 20230  
 SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
 MEASURING DATE : 10/11/2025  
 RECEIVED DATE : 10/11/2025  
 SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
 REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1)</sup>	STANDARD <sup>2)</sup>	UNIT
<b>แสงสว่างจากหลอดกิน</b>					
<b>GT 4</b>					
1. Lube Oil Cooler GT 4 ชุดอ็อกซิเจน	19:00	1,012	<200-300	<100	LUX
- พื้นที่ 1	19:00	1,100	<300	-	LUX
- พื้นที่ 2	19:00	1,095	<200	-	LUX
- พื้นที่ 3	19:01	731	<200-300	<100	LUX
2. De-Nox GT 4 ชุดอ็อกซิเจน	19:02	1,985	<200-300	<100	LUX
- พื้นที่ 1	19:02	2,140	<300	-	LUX
- พื้นที่ 2	19:02	2,010	<200	-	LUX
- พื้นที่ 3	19:03	533	<200-300	<100	LUX
4. HP Boiler HRSG 4 ชุดอ็อกซิเจน	19:04	412	<200-300	<100	LUX
5. LP Boiler ชุดอ็อกซิเจน	19:05	244	<200-300	<100	LUX
New RO	19:06	870	<200-300	<200	LUX
7. pH Control New RO ชุดอ็อกซิเจน	19:07	285	<200-300	<200	LUX
8. MCC New RO ชุดอ็อกซิเจน	19:08	1,469	<200-300	<100	LUX
BOP #2	19:08	1,737	<300	-	LUX
9. GSU 4 ชุดพวงน้ำดี	19:08	1,547	<200	-	LUX
- พื้นที่ 1					
- พื้นที่ 2					
- พื้นที่ 3					

REMARK : <sup>1)</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),  
 Illumination Standard

<sup>2)</sup> Notification of Ministry of Industry B.E. 2546 (2003)

- \* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
 (Measurement By Ms. Rattamee Nakket)



Approved By:   
 (MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
 THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
 WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY







Request No. LA68-R1146  
Report No. R6811-1454 - R6811-1722

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างจากภายใน</b>					
<b>GT 5</b>					
1. ห้องโถง GSU 7 คูณตู้ปรีซ์	19:54	836	<200-300	<100	LUX
2. ห้องโถง GSU 6 คูณตู้ปรีซ์	19:55	748	<200-300	<100	LUX
3. LP BFW Pump No.1 คูณตู้ปรีซ์	19:56	235	<200-300	<100	LUX
4. Line Water Cooling GTG 5 คูณตู้ปรีซ์	19:57	278	<200-300	<100	LUX
5. Sample Cooler Analysis 503M101 คูณตู้ปรีซ์	19:58	628	<200-300	<100	LUX
6. Chem Skid HRSO 5 คูณตู้ปรีซ์	19:59	293	<200-300	<100	LUX
7. Main HP Steam คูณตู้ปรีซ์	20:00	273	<200-300	<100	LUX
8. HP Steam Drum HRSO 5 คูณตู้ปรีซ์	20:01	227	<200-300	<100	LUX
9. LP Steam Drum HRSO 5 คูณตู้ปรีซ์	20:02	269	<200-300	<100	LUX
10. CT Make UP Cooling คูณตู้ปรีซ์	20:03	508	<200-300	<100	LUX
11. pH Cooling Monitor คูณตู้ปรีซ์	20:04	467	<200-300	<100	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



Approved By :   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างจากภายนอก</b>					
<b>โซนกลางแจ้ง</b>					
12. โซนกลางแจ้ง 9	20:16	196	-	<100	LUX
<b>โซนร่มเงา</b>					
- โซนร่มเงา ประตู 9 (แสงที่ส่องลอดขึ้น 2x2 ตารางเมตร)	20:15	242	-	-	LUX
จุดที่ 1	20:16	160	-	-	LUX
จุดที่ 2	20:16	201	<100	-	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratmanee Nakke)



Approved By :   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางคืน					
ห้อง New MCC ชั้น 3					
1. ติดะทำงาน 1 ชุด ไอซูร์	19:06	580	<400-500	<400	LUX
2. ติดะทำงาน 2 ชุด ไอซูร์	19:06	631	<400-500	<400	LUX
3. ติดะทำงาน 3 ชุด ไอซูร์	19:07	603	<400-500	<400	LUX
4. ติดะทำงาน 4 ชุด ไอซูร์	19:07	745	<400-500	<400	LUX
5. ติดะทำงาน 5 ชุด ไอซูร์	19:08	711	<400-500	<400	LUX
6. ติดะทำงาน 6 ชุด ไอซูร์	19:08	657	<400-500	<400	LUX
7. ติดะทำงาน 7 ชุด ไอซูร์	19:09	730	<400-500	<400	LUX
8. ติดะทำงาน 8 ชุด ไอซูร์	19:09	793	<400-500	<400	LUX
9. ติดะทำงาน 9 ชุด ไอซูร์	19:10	773	<400-500	<400	LUX
10. ติดะทำงาน 10 ชุด ไอซูร์	19:10	798	<400-500	<400	LUX
11. ติดะทำงาน 11 ชุด ไอซูร์	19:11	719	<400-500	<400	LUX
12. ติดะทำงาน 12 ชุด ไอซูร์	19:11	664	<400-500	<400	LUX
13. ติดะทำงาน 13 ชุด ไอซูร์	19:13	600	<400-500	<400	LUX
14. ติดะทำงาน 14 ชุด ไอซูร์	19:13	607	<400-500	<400	LUX
ห้อง New MCC ชั้น 3					
15. หน้าตู้ UMM Panel ชุด ไอซูร์	19:15	402	<200-300	<200	LUX
16. หน้าตู้ 115KV Control and Protection LRP 5-3 616E103A ชุด ไอซูร์	19:15	322	<200-300	<200	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009

(Measurement By Ms. Ratanee Nakket)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

## TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*: Lux Meter Serial No. R.032544, S.008890

SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางคืน					
ห้อง New MCC ชั้น 3					
17. หน้าตู้ 115KV Control and Protection LRP 5-2 616E103B ชุด ไอซูร์	19:16	290	<200-300	<200	LUX
18. หน้าตู้ STG-3 GSUT RTCC PANEL 616E102A ชุด ไอซูร์	19:16	350	<200-300	<200	LUX
19. หน้าตู้ GTG-6 GSUT RTCC PANEL 616E102A ชุด ไอซูร์	19:17	427	<200-300	<200	LUX
20. หน้าตู้ 61C-01 Process STEAM FLOW Computer ชุด ไอซูร์	19:17	506	<200-300	<100	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratanee Nakket)Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)

14/11/2025

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.หนองจันทน์ อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
E-mail : info@etc1992.com Website : http://www.etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukthapinik 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
E-mail : info@etc1992.com Website : http://www.etc1992.com

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukthapinik 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890  
SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025


SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางคืน</b>					
New MCC ชั้น 3	19:19	468	—	<400	LUX
21. ห้องประชุม (หลอดไฟติดระยอบบนเพดาน)					
- r-1		468		<150	LUX
- r-2		683		<150	LUX
- r-3		640		<150	LUX
- r-4		500		<150	LUX
R (ค่าเฉลี่ย r-1 ถึง r-4)		573		—	LUX
- q-1		479		<150	LUX
- q-2		578		<150	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-2)		529		—	LUX
- t-1		663		<150	LUX
- t-2		669		<150	LUX
T (ค่าเฉลี่ย t-1 ถึง t-2)		666		—	LUX
- p-1		552		<150	LUX
- p-2		776		<150	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		664		—	LUX
แสงสว่างเฉลี่ย		624		<300	LUX
ความกว้างของห้อง (W) = 7.00 เมตร	19:19 - 19:24	ความยาวของห้อง (L) = 11.10 เมตร			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakket)



Approved By :   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

บริษัท อีสเทิร์นไทย คอนซัลติ้ง 1992 จำกัด

683 หมู่ 11 อ.สุเทพนิคม 8 ต.หนองจันทน์ อ.ศรีราชา จ.ชลบุรี 20230  
โทร. 0-3848-1197, 0-3876-3031-2 แฟกซ์ : 0-3848-2095  
E-mail : info@etc1992.com Website : http://www.etc1992.com



EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11 Sukthapinik 8 Rd., Nongkham, Sriracha, Chonburi 20230  
Tel. 0-3848-1197, 0-3876-3031-2 Fax : 0-3848-2095  
E-mail : info@etc1992.com Website : http://www.etc1992.com

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukthapinik 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890  
SAMPLE NO. : 44661-44929  
REPORTED DATE : 14/11/2025

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
<b>แสงสว่างช่วงเวลากลางคืน</b>					
New MCC ชั้น 2	19:27	227	—	<200	LUX
22. New MCC (1) (หลอดไฟติดตั้งแนวตั้งกลางห้อง)					
- q-1		285		<100	LUX
- q-2		236		<100	LUX
- q-3		227		<100	LUX
- q-4		262		<100	LUX
- q-5		224		<100	LUX
- q-6		221		<100	LUX
- q-7		334		<100	LUX
- q-8		415		<100	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		276		—	LUX
- p-1		343		<100	LUX
- p-2		402		<100	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		373		—	LUX
แสงสว่างเฉลี่ย		295		<200	LUX
จำนวนหลอดไฟ (N) = 5 หลอด	19:26 - 19:31				

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ramanee Nakket)



Approved By :   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

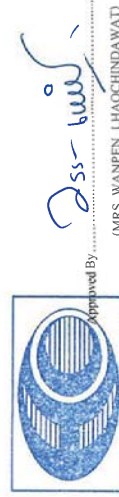
CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukthapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
New MCC ชั้น 2					
23. New MCC (2)	19:35	368	—	<200	LUX
- New MCC (2) (หลอดไฟติดตั้งตามตัวอย่างห้อง)					
- q-1		403	<100	—	LUX
- q-2		406	<100	—	LUX
- q-3		315	<100	—	LUX
- q-4		300	<100	—	LUX
- q-5		368	<100	—	LUX
- q-6		320	<100	—	LUX
- q-7		281	<100	—	LUX
- q-8		486	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		360	—	—	LUX
- p-1		459	<100	—	LUX
- p-2		433	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		446	—	—	LUX
แสงสว่างเฉลี่ย	19:33 - 19:38	377	<200	—	LUX
จำนวนหลอดไฟ (N) =	5	หลอด			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukthapibarn 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \* Lux Meter Serial No. R.032544, S.008890

SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงเวลากลางวัน					
New MCC ชั้น 2					
24. New MCC (3)	19:43	284	—	<200	LUX
- New MCC (3) (หลอดไฟติดตั้งตามตัวอย่างห้อง)					
- q-1		348	<100	—	LUX
- q-2		393	<100	—	LUX
- q-3		253	<100	—	LUX
- q-4		287	<100	—	LUX
- q-5		284	<100	—	LUX
- q-6		263	<100	—	LUX
- q-7		458	<100	—	LUX
- q-8		434	<100	—	LUX
Q (ค่าเฉลี่ย q-1 ถึง q-8)		340	—	—	LUX
- p-1		324	<100	—	LUX
- p-2		405	<100	—	LUX
P (ค่าเฉลี่ย p-1 ถึง p-2)		365	—	—	LUX
แสงสว่างเฉลี่ย	19:40 - 19:45	345	<200	—	LUX
จำนวนหลอดไฟ (N) =	5	หลอด			

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018), Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009 (Measurement By Ms. Ratanee Nakket)



บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด  
REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY



Request No. LA68-R1146

Report No. R6811-1454 - R6811-1722

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*; Lux Meter Serial No. R.032544, S.008890


SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางดึก					
STG #3 ชั้น 1					
1. 62MAC10CT042 ชุดไฟโถง	19:00	212	<200-300	<100	LUX
2. 6PT1502 ชุดไฟโถง	19:01	278	<200-300	<100	LUX
ห้องแม่ข่ายไฟฟ้า New MCC-CCR ชั้น 1					
3. GT6AT2 ชุดไฟโถง	19:02	228	<200-300	<100	LUX
4. GT6AT1 ชุดไฟโถง	19:03	366	<200-300	<100	LUX
5. GT6SST2 ชุดไฟโถง	19:04	276	<200-300	<100	LUX
6. GT6SST1 ชุดไฟโถง	19:05	225	<200-300	<100	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratanee Nakket)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

### TEST REPORT

CUSTOMER : Ratch Pathana Energy Public Company Limited  
ADDRESS : 636 Moo 11 Sukhapham 8 Rd., Nongkham, Sriracha, Chonburi 20230  
SAMPLE SOURCE : Ratch Pathana Energy Public Company Limited  
MEASURING DATE : 10/11/2025  
RECEIVED DATE : 10/11/2025  
SAMPLING INSTRUMENT : Illumination \*; Lux Meter Serial No. R.032544, S.008890


SAMPLE POINT	TIME	RESULT	STANDARD <sup>1</sup>	STANDARD <sup>2</sup>	UNIT
แสงสว่างช่วงกลางดึก					
New MCC ชั้น 1					
7. ห้องเก็บสารเคมี	19:51	288	—	<200	LUX
- ห้องเก็บสารเคมี (แม่เหล็กไฟฟ้าแรงดันสูง 2x2 ตารางเมตร)					
จุดที่ 1	19:46	264	<100	—	LUX
จุดที่ 2	19:46	336	<100	—	LUX
จุดที่ 3	19:47	326	<100	—	LUX
จุดที่ 4	19:47	328	<100	—	LUX
จุดที่ 5	19:48	272	<100	—	LUX
จุดที่ 6	19:48	288	<100	—	LUX
จุดที่ 7	19:49	324	<100	—	LUX
จุดที่ 8	19:49	586	<100	—	LUX
จุดที่ 9	19:50	221	<100	—	LUX
จุดที่ 10	19:50	208	<100	—	LUX
จุดที่ 11	19:51	352	<100	—	LUX
จุดที่ 12	19:51	238	<100	—	LUX
ห้องเก็บสารเคมี (แสงสว่างเฉลี่ย)	19:46 - 19:51	312	<200	—	LUX

REMARK : <sup>1</sup> Notification of The Department of Labour Protection and Welfare B.E. 2561 (2018),

Illumination Standard

<sup>2</sup> Notification of Ministry of Industry B.E. 2546 (2003)

\* Parameter have License Registration of Department of Labour Protection and Welfare No. 0402-03-2564-0009  
(Measurement By Ms. Ratanee Nakket)

Approved By:   
(MRS. WANPEN LHAOCHINDAWAT)  
14/11/2025

บริษัท อีสเทิร์นไทยคอนซัลติ้ง 1992 จำกัด

REPORTED TEST REFER TO SUBMITTED SAMPLES ONLY  
THIS REPORT SHALL NOT REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL LABORATORY

COPY

## ภาคผนวกที่ 2

หนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกซน  
และใบอนุญาตเป็นผู้ให้บริการตรวจวัดและวิเคราะห์ระดับความเข้มข้น  
ของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษา  
สารเคมีอันตราย ระดับความร้อน แสงสว่าง และเสียง  
จากกรรมสวัสดิการและคุ้มครองแรงงาน

บริษัท อีสเทิร์น ไทย คอนซัลตติ้ง 1992 จำกัด

---



ที่ อภ ๐๓๒๐/๑๓๔๒

๒๗ กรกฎาคม ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๙๕๒ จำกัด

อ้างถึง คำขอต่ออายุของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๗ มิถุนายน ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับรองห้องปฏิบัติการวิเคราะห์เอกชน

๑. รายชื่อคุณดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๔๐ ราย

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒๕ ราย

๓. ขอบข่ายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๕๒ รายการ จำนวน ๑๙ แห่ง

ตามหนังสือที่อ้างถึง บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๙๕๒ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๐๐๓ สามห้องเลขที่ ๖๔๓ หมู่ที่ ๑๑ ถนนสุขุมวิท ๘ ตำบลพนาฆาม อำเภอศรีราชา จังหวัดชลบุรี ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้อิสเทิร์น ไทย คอนซัลติ้ง ๑๙๕๒ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๔๐ ราย ตามสิ่งที่ส่งมาด้วย ๑ .  
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒๕ ราย ตามสิ่งที่ส่งมาด้วย ๒  
ค. ขอบข่ายสารเคมีที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๔๗ รายการ  
อากาศเสีย (ปล่อยระเหย) จำนวน ๒๑ รายการ น้ำดื่ม จำนวน ๑๑๑ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๑๘ รายการ และดิน จำนวน ๘๕ รายการ รวมทั้งสิ้นจำนวน ๒๕๒ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๕ กรกฎาคม ๒๕๖๘ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทวี อำพาพันธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒

ไปรษณีย์อิเล็กทรอนิกส์ elw@dw.mail.go.th

Official Exclusion

\*อุตสาหกรรมทั่วโลก ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว\*



เอกสารแนบท้ายหนังสือรับรองห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๙๕๒ จำกัด

ที่ อภ ๐๓๒๐/๑๓๔๒

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๔๐ ราย

๑) นางสาวนงนุช เลขะวิกุล

๒) นายวัฒนา โคตรหล้า

๓) นางสาวณัฏฐา เหลาจินดาวัฒน์

๔) นายเกษร สุทธิทรัพย์

๕) นางสาวนันท์นภัส แขนุทด

๖) นางสาวพรภา หลงคำหงษ์

๗) นางสาวอภิรดี ชื่นอารมย์

๘) นางสาวอัจฉรี จิตะยโสธร

๙) นางสาวจิราพร ปานคง

๑๐) นายสุทธา สอนรัมย์

๑๑) นางสาวนันทพรภา อุดสูงเนิน

๑๒) นายอภัย บุญศักดิ์

๑๓) นางสาวนันทพร กลิ่นโสภณ

๑๔) นายธีระพงษ์ นวลอินทร์

๑๕) นางสาวแพรว พลเสน

๑๖) นายพรพล ผิวอ้วน

๑๗) นายภาคภูมิ บวรสวัสดิ์

๑๘) นางสาวจันทิมา สายพันธ์

๑๙) นายภาณุพงศ์ บำรุงส

๒๐) นางสาวปภาณิน จันทะสอน

๒๑) นายวรกร ไชยเสวี

๒๒) นางสาววรรณภา ไชยศิริ

๒๓) นางสาวพรพินิล ภูมิคอนสาร

๒๔) นางสาวณัฏฐา แสอ้อย

๒๕) นางสาวบุญเรือง บุญถม

๒๖) นางสาวกัมรินทร์ ป้อมน้อย

๒๗) นายชานนวัฒน์ ไชยวงศ์

๒๘) นางสาวพณีย์ งามวิสัย

๒๙) นายวิญญ์วัช สิงห์โต

๓๐) นางสาวนุช อามศรี

๓๑) นายศุภณัฐ พาดกลาง

๓๒) นายณัฏฐพล ทองหล่อ

๓๓) นายธรรมรัตน์ โพธิ์ต้นคำ

๓๔) นายไอลา ขวัญศิริมงคล

๓๕) นายเมธี สุขประเสริฐ

๓๖) นางสาวพรพินันท์...





- ๓๖) นางสาวพรพินันท์ วัลยกุล
- ๓๗) นางสาวอภิญญา ศรีสนธิ์
- ๓๘) นางสาวนภัทรธรรณต์ ประดิษฐ์นุช
- ๓๙) นางสาวสุวิษา เจริญแสง
- ๔๐) นางสาวรณิชน อินัน

- ทะเบียนเลขที่ ๖-๐๐๓-ค-๐๐๓๖
- ทะเบียนเลขที่ ๖-๐๐๓-ค-๐๐๓๗
- ทะเบียนเลขที่ ๖-๐๐๓-ค-๐๐๓๘
- ทะเบียนเลขที่ ๖-๐๐๓-ค-๐๐๓๙
- ทะเบียนเลขที่ ๖-๐๐๓-ค-๐๐๔๐

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒๕ ราย

- ๑) นางสาวดวงมณี เนื้อทอง
- ๒) นางสาวขวัญรัตน์ อินทุสุข
- ๓) นางสาวกัญญนัฏกา จันทร์ทอดแก้ว
- ๔) นางสาวฉัตรสุดา มงคลโนชน
- ๕) นางสาวณัฐวดี อัมมททัศน์
- ๖) นางสาวนิอรธมา ประ
- ๗) นางสาวอริญลักษณ์ ชินโต
- ๘) นางสาวสุทธิดา สร้างแก้ว
- ๙) นายอุดมทรัพย์ เจนจบจริง
- ๑๐) นายณธิป สงวนศิลป์
- ๑๑) นายรัชชัย พอลใจ
- ๑๒) นายณัฐเดช ทะพงษ์
- ๑๓) นางสาวสุนิศา มิแก
- ๑๔) นางสาวสุรยา เพชรประไพ
- ๑๕) นางสาวจุฑามาศ เจริญพรหม
- ๑๖) นางสาวนิภาพร คำขมูก
- ๑๗) นางสาวอรุษา พันธุ์เมือง
- ๑๘) นายกิตติ ไทโรจน์
- ๑๙) นายชาญณรงค์ ตั้งธรรมรักษ์
- ๒๐) นางสาวปริศนา เอ็นไต้ยะ
- ๒๑) นางสาวจุฑาพิทย์ กิจดี
- ๒๒) นางสาวสุภาวดี ศรีละยอง
- ๒๓) นางสาวณัฐชา บรรพบุตร
- ๒๔) นางสาวณัฐิชา นนตานอก
- ๒๕) นางสาวดวงสุดา แสนวันดี

- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๑
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๒
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๓
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๔
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๕
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๖
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๗
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๘
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๙
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๐
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๑
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๒
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๓
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๔
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๕
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๖
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๗
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๘
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๙
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๐
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๑
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๒
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๓
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๔
- ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๕

เอกสารแนบท้ายหนังสือรับตอบข้อหารือของห้องปฏิบัติการวิเคราะห์ของ  
บริษัท อีสเทิร์น ไทย คอมมูนิคิง จำกัด เลขทะเบียน ๖-๐๐๓  
ที่ อก ๐๓๒๐/๑๑๓๒๖ ลงวันที่ ๒๗ กรกฎาคม ๒๕๖๖

ขอขยายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๕๒ รายการ

น้ำเสีย จำนวน 47 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
2	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
3	Barium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
6	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
7	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method <sup>(4)</sup> 2) 5-Day BOD Test, Azide Modification Method <sup>(4)</sup>
9	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>(4)</sup>
11	cis-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
12	trans-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
13	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

✓

COPY

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
14	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>(4)</sup>
15	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
16	Cyanide	Distillation, Colorimetric Method <sup>(4)</sup>
17	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
18	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
19	DDT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
20	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
21	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
22	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
23	Endosulfan sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
25	Endrin aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
26	Endrin ketone	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
27	Formaldehyde	Distillation, Colorimetric Method <sup>(3)</sup>
28	Free Chlorine	1) Iodometric Method <sup>(4)</sup> 2) Colorimetric Method <sup>(4)</sup>

29 Heptachlor ...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
29	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
30	Heptachlor Epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
31	Hexavalent Chromium	Filtration, Colorimetric Method <sup>(4)</sup>
32	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
33	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
34	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
35	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
36	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
37	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>(4)</sup>
38	pH	Electrometric Method <sup>(4)</sup>
39	Phenols	Distillation, Direct Photometric Method <sup>(4)</sup>
40	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup>
41	Sulfide	ZnS Precipitation, Iodometric Method <sup>(4)</sup>
42	Temperature	Field Method <sup>(4)</sup>
43	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(4)</sup>
44	Total Dissolved Solids	Dried at 180 °C <sup>(4)</sup>
45	Total Kjeldahl Nitrogen	Macro Kjeldahl Method <sup>(4)</sup>
46	Total Suspended Solids	Dried at 103-105 °C <sup>(4)</sup>
47	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

อากาศเสีย...

COPY

อากาศเสีย (ไม่ดองระเหย) จำนวน 21 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
3	Cadmium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
4	Carbon Monoxide	1) Bag, Non-Dispersive Infrared Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[5]</sup>
5	Chromium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
6	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
7	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
9	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
10	Manganese	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
11	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[5]</sup>
12	Nickel	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
13	Opacity	Ringelmann's Method <sup>[1,5]</sup>
14	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method <sup>[8]</sup> 2) Instrumental Analyzer Method <sup>[7]</sup>
15	Selenium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
16	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[5]</sup>
17	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[6]</sup>
18	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>

19 Total Suspended Particulate...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
19	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[6]</sup>
20	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
21	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>[6]</sup>

น้ำได้ดิน จำนวน 11 รายการ

ลำดับที่	สารเคมี	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	Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
6	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
7	Barium	Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
8	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
9	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
10	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
11	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
12	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
13	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
14	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>

15 Bis(2-chloroethyl)ether...

COPY

-b-

ลำดับที่	สารเคมี	วิธีวิเคราะห์
15	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
16	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
17	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
18	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
19	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
20	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
21	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
22	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
23	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
24	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
25	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
26	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
27	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
28	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
29	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
30	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
31	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
32	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method; Calculation <sup>(a)</sup>

33 Chromium (VI)

52 Dieldrin...

-c-

ลำดับที่	สารเคมี	วิธีวิเคราะห์
33	Chromium (VI)	Filtration, Colorimetric Method <sup>(a)</sup>
34	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
35	Cyanide	Distillation, Colorimetric Method <sup>(a)</sup>
36	DDD	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
37	DDE	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
38	DDT	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
39	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
40	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
41	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
42	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
43	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
44	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
45	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
46	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
47	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
48	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
49	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
50	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>
51	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(a)</sup>

52 Dieldrin...

52 Dieldrin...



ลำดับที่	สารเคมี	วิธีวิเคราะห์
52	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
53	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
54	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
55	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
56	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
57	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
58	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
59	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
60	Ethylbenzene	Spectrometric Method <sup>(4)</sup>
61	Fluoranthene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
62	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
63	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
64	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
65	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
66	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
67	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
68	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
69	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

70  $\gamma$ -HCH...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
70	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
71	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
72	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
73	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
74	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
75	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
76	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
77	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
78	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
79	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
80	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
81	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
82	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
83	Naphthalene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
84	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
85	Nitrobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
86	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
87	pH	Electrometric Method <sup>(4)</sup>
88	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

89 Phenol...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
89	Phenol	1) Distillation, Direct Photometric Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
90	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
91	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup>
92	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
93	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
94	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
95	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
96	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
97	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
98	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
99	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
100	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
101	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
102	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
103	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
104	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
105	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
106	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

107 m-Xylene...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
107	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
108	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
109	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
110	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
111	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

## สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 18 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
2	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
3	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
4	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
5	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
6	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
7	Chromium (VI)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(9,13)</sup>
8	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
9	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>

10 Lead...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
10	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
11	Mercury	1) Waste Extraction, Digestion, Cold Vapor Atomic Absorption Spectrometric Method <sup>(2,11)</sup> 2) Digestion, Cold vapor Atomic Absorption Spectrometric Method <sup>(9,11)</sup>
12	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
13	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
14	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
15	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
16	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
17	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
18	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,9,10)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>

ดิน...

COPY

## ดิน จำนวน 95 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,4,16)</sup>
3	Anthracene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
4	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
5	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
6	Barium	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
7	Benz(a)anthracene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
8	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,4,16)</sup>
9	Benzol(b)fluoranthene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
10	Benzol(k)fluoranthene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
11	Benzol(a)pyrene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
12	Benzol(g,h,i)perylene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
13	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
14	Bis(2-chloroethyl)ether	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
15	Bis(2-ethylhexyl)phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,17)</sup>
16	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,4,16)</sup>
17	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,4,16)</sup>
18	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1,4,16)</sup>

19 Butyl benzyl phthalate...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
19	Butyl benzyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
20	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(9.10)</sup>
21	Carbazole	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
22	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
23	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
24	p-Chloroaniline	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
25	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
26	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
27	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
28	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
29	Chromium	Digestion, Inductively Coupled Plasma Method <sup>(9.10)</sup>
30	Chromium (III)	Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method; Calculation <sup>(9.10)</sup>
31	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(12.13)</sup>
32	Chrysene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
33	Dibenz(a,h)anthracene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
34	Di-n-butyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
35	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
36	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
37	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>

38 1,1-Dichloroethane...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
38	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
39	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
40	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
41	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
42	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
43	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
44	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
45	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
46	Diethyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
47	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
48	2,4-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
49	2,6-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
50	Di-n-octyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
51	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14.16)</sup>
52	Fluoranthene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
53	Fluorene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
54	Hexachlorobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>
55	Hexachloro-1,3-butadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15.17)</sup>

56 n-Hexane...

COPY



๑๖-

ลำดับที่	สารเคมี	วิธีวิเคราะห์
56	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
57	Hexachlorocyclopentadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
58	Hexachloroethane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
59	Indeno(1,2,3-cd)pyrene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
60	Isophorone	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
61	Lead	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
62	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
63	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(8,11)</sup>
64	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
65	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
66	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
67	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
68	Naphthalene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
69	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
70	Nitrobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
71	N-Nitrosodi-n-propylamine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
72	Phenanthrene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
73	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
74	Pyrene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>

75 Selenium...

COPY

๑๗-

ลำดับที่	สารเคมี	วิธีวิเคราะห์
75	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
76	Silver	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
77	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
78	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
79	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
80	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
81	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
82	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
83	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
84	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
85	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
86	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(15,17)</sup>
87	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
88	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>
89	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
90	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
91	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
92	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>
93	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,16)</sup>

94 Xylene (Total)...

COPY

ลำดับที่	สารเคมี	วิธีวิเคราะห์
94	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(16)</sup>
95	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(9,10)</sup>

**เอกสารอ้างอิง**

- กระทรวงอุตสาหกรรม. **ประกาศกระทรวงอุตสาหกรรม พ.ศ.2549** เรื่องกำหนดคำนิยามเข้ามาค้าที่เจือปนในอากาศที่ระบายออกจากรถยนต์ของรถยนต์นั่งส่วนบุคคลเกิน 125 ซี.ซี.ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125 ง.
- กระทรวงอุตสาหกรรม. **ประกาศกระทรวงอุตสาหกรรม พ.ศ.2548** เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว. ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 114.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.
- APHA, AWWA, WEF. **Standard Methods for the Examination of Water and Wastewater**. 23<sup>rd</sup> ed. Washington, DC : APHA, 2017
- United States Environmental Protection Agency. **Standard of Performance for New Stationary Sources**. 40 CFR Part 60. Appendix A, 2017.
- United States Environmental Protection Agency. **Standard of Performance for New Stationary Sources**. 40 CFR Part 60. Appendix A, 2019.
- United States Environmental Protection Agency. **Standard of Performance for New Stationary Sources**. 40 CFR Part 60. Appendix A, 2020.
- United States Environmental Protection Agency. **Standard of Performance for New Stationary Sources**. 40 CFR Part 60. Appendix A, 2023.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Acid Digestion of Sediments Sludge and Soils**. SW-846 Method 3050B, 1996.
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Inductively Coupled Plasma-Atomic Emission spectrometry**. SW-846 Method 6010C, 2007.
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique)**. SW-846 Method 7471B, 2007.
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Alkaline digestion for Hexavalent Chromium**. SW-846 Method 3060A, 1996.

copy

- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Chromium. Hexavalent (Colorimetric)**. SW-846 Method 7196A, 1992
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples**. SW-846 Method 5035A, 2002
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Ultrasonic Extraction**. SW-846 Method 3550C, 2007
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)**. SW-846 Method 8260D, 2018
- United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry**. SW-846 Method 8270E, 2018

AF

copy



ที่ อก ๐๓๒๐/ ๔๖๐๔ /

กรมโรงงานอุตสาหกรรม

ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๔ พฤษภาคม ๒๕๖๗

เรื่อง เปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร  
ของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท อีสเทิร์น ไทย คอนสตรัคชั่น จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๔ มีนาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ และเปลี่ยนแปลง  
สารมลพิษบริษัท อีสเทิร์น ไทย คอนสตรัคชั่น จำกัด จำนวน ๑๒ แผ่น

ตามคำขอฯ ที่อ้างถึง บริษัท อีสเทิร์น ไทย คอนสตรัคชั่น จำกัด ห้องปฏิบัติการวิเคราะห์  
เอกชน เลขทะเบียน ๖-๐๐๓ สถานที่ตั้งเลขที่ ๖๘๓ หมู่ที่ ๑๑ ถนนสุขุมวิท ๘ ตำบลหนองแขม  
อำเภอศรีราชา จังหวัดชลบุรี แจ้งขอเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษในน้ำเสีย น้ำใต้ดิน  
เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกคู่มือและห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ราย  
นายวัฒนา โคตรหล้า ทะเบียนเลขที่ ๖-๐๐๓-๙-๐๐๑๒
๒. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย  
นางสาวอัญชลี พะพงษ์ ทะเบียนเลขที่ ๖-๐๐๓-๙-๐๐๑๒  
นางสาวจุฑามาศ เจริญพรหม ทะเบียนเลขที่ ๖-๐๐๓-๙-๐๐๑๕  
นางสาวณัฐนิช นมตานอก ทะเบียนเลขที่ ๖-๐๐๓-๙-๐๐๒๔

๓. ให้ยกเลิกมอบหมายรายการสารมลพิษในน้ำเสีย และน้ำใต้ดินตามรายการเอกสารแนบท้าย

หนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชนที่ อก ๐๓๒๐/๑๓๕๒ ลงวันที่ ๒๗ กรกฎาคม ๒๕๖๖

๔. ให้วิเคราะห์สารมลพิษตามขอบข่ายที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๔๗ รายการ  
และน้ำใต้ดิน จำนวน ๑๑๑ รายการ รวมทั้งสิ้นจำนวน ๑๕๘ รายการ ตามเอกสารแนบท้ายหนังสือเปลี่ยนแปลง  
เอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร ดังสิ่งที่ส่งมาด้วย

๕. ให้วิเคราะห์สารมลพิษตามขอบข่ายที่ได้รับขึ้นทะเบียนให้วิเคราะห์เพิ่มเติมในดิน จำนวน  
๑๒ รายการ ตามเอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษเปลี่ยนแปลงสารมลพิษ  
ในดิน และเปลี่ยนแปลงบุคลากร ดังสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือ ....



“อุตสาหกรรมก้าวหน้า ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



-๒-

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกชนในวันที่ ๔ กรกฎาคม ๒๕๖๘

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

HA

(นายพรยศ กัลลังกรอง)  
หน่ออินดี บุณิศราภรณ์  
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนากลยี่ห้อโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๓๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ airw@dlw.mae.go.th



“อุตสาหกรรมก้าวหน้า ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารอ้างอิงวิธีวิเคราะห์สารมลพิษ

บริษัท อีลเทิร์น ไทย คอนซัลติ้ง ๑๙๙๒ จำกัด เลขทะเบียน ๖-๐๐๓

ที่ อก ๐๒๒๐๐/ ลงวันที่

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๗๐ รายการ

#### น้ำเสีย จำนวน 47 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
2	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
3	Barium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
6	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
7	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method <sup>(1)</sup> 2) 5-Day BOD Test, Azide Modification Method <sup>(1)</sup>
9	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>(1)</sup>
11	cis-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

12 trans-Chlordane ...



-๒-

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
12	trans-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
13	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
14	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>(1)</sup>
15	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
16	Cyanide	Distillation, Colorimetric Method <sup>(1)</sup>
17	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
18	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
19	DDT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
20	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
21	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
22	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
23	Endosulfan sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

25 Endrin aldehyde ...





ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
25	Endrin aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
26	Endrin ketone	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
27	Formaldehyde	Distillation, Colorimetric Method <sup>(4)</sup>
28	Free Chlorine	1) Iodometric Method <sup>(1)</sup> 2) Colorimetric Method <sup>(1)</sup>
29	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
30	Heptachlor Epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
31	Hexavalent Chromium	Filtration, Colorimetric Method <sup>(1)</sup>
32	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
33	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
34	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1)</sup>
35	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
36	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
37	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>(1)</sup>
38	pH	Electrometric Method <sup>(1)</sup>
39	Phenols	Distillation, Direct Photometric Method <sup>(1)</sup>
40	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup>

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
41	Sulfide	ZnS Precipitation, Iodometric Method <sup>(1)</sup>
42	Temperature	Field Method <sup>(1)</sup>
43	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method: Filtration, Colorimetric Method; Calculation <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(1)</sup>
44	Total Dissolved Solids	Dried at 180 °C <sup>(1)</sup>
45	Total Kjeldahl Nitrogen	Macro Kjeldahl Method <sup>(1)</sup>
46	Total Suspended Solids	Dried at 103-105 °C <sup>(1)</sup>
47	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

#### ภาคผนวก 111 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
6	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
7	Barium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
8	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
9	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
10	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
11	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
12	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
13	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
14	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
15	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
16	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
17	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
18	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
19	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
20	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
21	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
22	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
23	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
24	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
25	Chloridane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
26	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
27	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
28	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
29	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
30	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
31	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
32	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method; Calculation <sup>(1)</sup>
33	Chromium (VI)	Filtration, Colorimetric Method <sup>(1)</sup>
34	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
35	Cyanide	Distillation, Colorimetric Method <sup>(1)</sup>
36	DDD	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
37	DDE	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
38	DDT	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
39	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>



ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
40	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
41	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
42	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
43	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
44	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
45	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
46	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
47	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
48	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
49	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
50	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
51	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
52	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
53	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
54	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
55	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
56	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
57	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
58	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
59	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
60	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
61	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
62	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
63	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
64	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
65	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
66	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
67	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
68	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
69	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
70	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
71	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
72	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
73	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
74	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
75	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
76	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
77	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1)</sup>
78	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
79	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
80	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
81	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
82	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
83	Naphthalene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
84	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
85	Nitrobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

86 N-Nitrosodi-n-propylamine ...

COPY

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
86	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
87	pH	Electrometric Method <sup>(4)</sup>
88	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
89	Phenol	1) Distillation, Direct Photometric Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
90	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
91	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup>
92	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
93	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
94	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
95	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
96	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
97	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
98	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
99	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
100	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
101	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

102 2,4,6-Trichlorophenol ...

COPY



ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
102	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
103	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
104	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
105	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
106	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
107	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
108	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
109	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
110	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
111	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
5	Aldrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
6	Heptachlor epoxide	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
7	Chlordane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
8	Dieldrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
9	Endrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
10	DDD	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
11	DDT	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
12	Methoxychlor	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>

## เอกสารอ้างอิง

1. APHA, AWWA, WEF. **Standard Methods for the Examination of Water and Wastewater**. 24<sup>th</sup> ed. Washington, DC: APHA, 2023.
2. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Ultrasonic Extraction**. SW-846 Method 3550C, 2007
3. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. **Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry**. SW-846 Method 8270E, 2018
4. สมาคมวิทยาศาสตร์สิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพมหานคร: เรือนแก้วการพิมพ์, 2547.

## ค้น จำนวน 12 รายการ

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
1	$\alpha$ -HCH	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
2	$\beta$ -HCH	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
3	$\gamma$ -HCH	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
4	Heptachlor	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>



ที่ อก ๐๓๒๐/ ๔๖ ๐๔ /

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐  
๒๕๖๓

เรื่อง เปลี่ยนแปลงเอกสารอ้างอิงวิถีเศรษฐกิจสีเขียวของโรงงานอุตสาหกรรม  
ขอให้องค์กรปฏิบัติตามระเบียบ

เรียน กรรมการผู้จัดการ บริษัท อีสเทิร์น ไทย คอมมูนิตี้ ๑๕๕๒ จำกัด  
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร  
ลงวันที่ ๔ มีนาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิถีเศรษฐกิจสีเขียว และเปลี่ยนแปลง  
สารมลพิษบริษัท อีสเทิร์น ไทย คอมมูนิตี้ ๑๕๕๒ จำกัด จำนวน ๑๒ แผ่น  
ตามคำขอ ที่อ้างถึง บริษัท อีสเทิร์น ไทย คอมมูนิตี้ ๑๕๕๒ จำกัด ขอแจ้งการปฏิบัติตาม  
เอกสาร เลขทะเบียน ๖-๐๐๓ สถานที่ตั้งเลขที่ ๖๘๓ หมู่ที่ ๑๑ ถนนสุขุมวิท ๘ ตำบลหนองแขม  
อำเภอศรีราชา จังหวัดชลบุรี แจ้งขอเปลี่ยนแปลงเอกสารอ้างอิงวิถีเศรษฐกิจสีเขียวในน้ำเสีย น้ำใต้ดิน  
เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้  
๑. ให้ยกเลิกควบคุมดูแลต่อปฏิบัติการวิเคราะห์ จำนวน ๑ ราย  
นายวัฒนา โคตรหล้า ทะเบียนเลขที่ ๖-๐๐๓-ก-๐๐๐๒  
๒. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย  
๑) นางสาวอัญชลี พะพงษ์ ทะเบียนเลขที่ ๖-๐๐๓-ก-๐๐๑๒  
๒) นางสาวจุฑามาศ เจริญพรหม ทะเบียนเลขที่ ๖-๐๐๓-ก-๐๐๑๔  
๓) นางสาวณัฐนิช นาคานอก ทะเบียนเลขที่ ๖-๐๐๓-ก-๐๐๑๔  
๓. ให้ยกเลิกขอขายรายการสารมลพิษในน้ำเสีย และน้ำใต้ดินตามรายการเอกสารแนบท้าย  
หนังสือต่ออายุขึ้นทะเบียนของปฏิบัติการวิเคราะห์เอกสารที่ อก ๐๓๒๐/๑๕๕๒ ลงวันที่ ๒๗ กรกฎาคม ๒๕๖๖  
๔. ให้วิเคราะห์สารมลพิษตามข้อหาย่อยที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๔๗ รายการ  
และน้ำใต้ดิน จำนวน ๑๑ รายการ รวมทั้งสิ้นจำนวน ๑๕๘ รายการ ตามเอกสารแนบท้ายหนังสือเปลี่ยนแปลง  
เอกสารอ้างอิงวิถีเศรษฐกิจสีเขียว เปลี่ยนแปลงสารมลพิษในดิน และเปลี่ยนแปลงบุคลากร ดังสิ่งที่ส่งมาด้วย  
๕. ให้วิเคราะห์สารมลพิษตามข้อหาย่อยที่ได้รับขึ้นทะเบียนให้วิเคราะห์เพิ่มเติมในดิน จำนวน  
๑๒ รายการ ตามเอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิถีเศรษฐกิจสีเขียวเปลี่ยนแปลงสารมลพิษ  
ในดิน และเปลี่ยนแปลงบุคลากร ดังสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือ ....



อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกสารในวันที่ ๔ กรกฎาคม ๒๕๖๔  
จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรยศ กัมมกรอง)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๓๓ ๖๐๔๔ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ givw@dlw.mail.go.th



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๙๙๓ จำกัด เลขทะเบียน ๖-๐๐๓

ที่ อภ ๐๓๒๐/ ลงวันที่

ขอช่วยสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๒๐ รายการ

น้ำเสีย จำนวน 47 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
2	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup> Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
3	Barium	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
6	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
7	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method <sup>(1)</sup> 2) 5-Day BOD Test, Azide Modification Method <sup>(1)</sup>
9	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup> Closed Reflux, Titrimetric Method <sup>(1)</sup>
10	Chemical Oxygen Demand	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
11	cis-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

12 trans-Chlordane ...

๑๑๒๐/

-๒-

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
12	trans-Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
13	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup> ADMI Weighted-Ordinate Spectrophotometric Method <sup>(1)</sup>
14	Color	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
15	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
16	Cyanide	Distillation, Colorimetric Method <sup>(1)</sup>
17	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
18	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
19	DDT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
20	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
21	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
22	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
23	Endosulfan sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
24	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

25 Endrin aldehyde ...

๑๑๒๐/

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
25	Endrin aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
26	Endrin ketone	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
27	Formaldehyde	Distillation, Colorimetric Method <sup>(4)</sup>
28	Free Chlorine	1) Iodometric Method <sup>(1)</sup> 2) Colorimetric Method <sup>(1)</sup>
29	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
30	Heptachlor Epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
31	Hexavalent Chromium	Filtration, Colorimetric Method <sup>(1)</sup>
32	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
33	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
34	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1)</sup>
35	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
36	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
37	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>(1)</sup>
38	pH	Electrometric Method <sup>(1)</sup>
39	Phenols	Distillation, Direct Photometric Method <sup>(1)</sup>
40	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup>



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
41	Sulfide	ZnS Precipitation, Iodometric Method <sup>(1)</sup>
42	Temperature	Field Method <sup>(1)</sup>
43	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(1)</sup>
44	Total Dissolved Solids	Dried at 180 °C <sup>(1)</sup>
45	Total Kjeldahl Nitrogen	Macro Kjeldahl Method <sup>(1)</sup>
46	Total Suspended Solids	Dried at 103-105 °C <sup>(1)</sup>
47	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

## น้ำดื่ม จำนวน 111 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
6	Arsenic	1) Continuous Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
7	Barium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
8	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>





ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
9	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
10	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
11	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
12	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
13	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
14	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
15	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
16	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
17	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
18	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
19	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
20	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
21	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
22	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
23	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
24	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>



ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
25	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
26	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
27	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
28	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
29	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
30	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
31	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
32	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method; Calculation <sup>(1)</sup>
33	Chromium (VI)	Filtration, Colorimetric Method <sup>(1)</sup>
34	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
35	Cyanide	Distillation, Colorimetric Method <sup>(1)</sup>
36	DDD	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
37	DDE	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
38	DDT	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
39	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
40	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
41	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
42	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
43	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
44	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
45	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
46	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
47	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
48	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
49	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
50	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
51	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
52	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
53	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
54	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

COPY

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
55	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
56	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
57	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
58	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
59	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
60	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
61	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
62	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
63	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
64	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
65	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
66	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
67	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
68	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
69	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

COPY

ลำดับ ที่	สารเคมี	วิธีการตรวจ
70	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
71	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
72	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
73	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
74	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
75	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(1)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
76	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
77	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1)</sup>
78	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
79	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
80	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
81	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
82	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
83	Naphthalene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
84	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
85	Nitrobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>

86 N-Nitrosodi-n-propylamine ...

COPY

ลำดับ ที่	สารเคมี	วิธีการตรวจ
86	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1)</sup>
87	pH	Electrometric Method <sup>(4)</sup>
88	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
89	Phenol	1) Distillation, Direct Photometric Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
90	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
91	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup>
92	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
93	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
94	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
95	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
96	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
97	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
98	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
99	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
100	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
101	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

102 2,4,6-Trichlorophenol ...

COPY

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
102	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
103	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
104	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
105	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
106	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
107	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
108	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
109	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
110	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
111	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
5	Aldrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
6	Heptachlor epoxide	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
7	Chlordane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
8	Dieldrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
9	Endrin	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
10	DDD	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
11	DDT	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>
12	Methoxychlor	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(2,3)</sup>

## เอกสารอ้างอิง

1. APHA, AWWA, WEF. **Standard Methods for the Examination of Water and Wastewater**. 24<sup>th</sup> ed. Washington, DC: APHA, 2023.
2. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste. Physical/Chemical Methods. **Ultrasonic Extraction. SW-846 Method 3550C**, 2007
3. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste. Physical/Chemical Methods. **Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry. SW-846 Method 8270E**, 2018
4. สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพมหานคร: เรือนแก้วการพิมพ์, 2547.





ที่ อก ๐๓๑๐(๓)/ ๘๓ ๔ ๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๕ ตุลาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์  
เรียน กรรมการผู้จัดการ บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๔๕๒ จำกัด  
อ้างถึง คำขอขึ้นทะเบียน/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๔ สิงหาคม ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแบบทนายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์  
บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๔๕๒ จำกัด จำนวน ๑ แผ่น

ตามคำขอที่อ้างถึง บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๔๕๒ จำกัด ห้องปฏิบัติการวิเคราะห์  
เอกชน เลขทะเบียน ๖-๐๐๓ สถานที่ตั้งเลขที่ ๖๔๘ หมู่ที่ ๑๑ ถนนสุขุมวิท ๘ ตำบลหนองแขม อำเภอศรีราชา  
จังหวัดชลบุรี ขอเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ราย  
นายภาคภูมิ บัวสวัสดิ์  
๒. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย  
ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๗
- ๑) นางสาวนิอรธมา ป่าระ  
ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๑๖
- ๒) นางสาวสุจิตา สร้างแก้ว  
ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๐๘
- ๓) นางสาวดวงสุดา แสนวันดี  
ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๕
๓. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑ ราย  
นายรณรงค์ อารีเอื้อ  
ทะเบียนเลขที่ ๖-๐๐๓-จ-๐๐๒๖
๔. ให้เพิ่มขอขยายชนิดสารมลพิษที่วิเคราะห์ในน้ำได้ดิน และดิน ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะสำเนาพร้อมหนังสืออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ในวันที่ ๕ กรกฎาคม ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)  
ผู้อำนวยการกองขึ้นทะเบียนและควบคุมโรงงาน  
ปฏิบัติการกรมโรงงานอุตสาหกรรม

ดูรายละเอียดเพิ่มเติมได้ที่สำนักงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๖  
ไปรษณีย์อิเล็กทรอนิกส์ emwdd@w.go.th



อุตสาหกรรมก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว  
Green Industry

เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

บริษัท อีสเทิร์น ไทย คอนซัลติ้ง ๑๔๕๒ จำกัด เลขทะเบียน ๖-๐๐๓  
ที่ อก ๐๓๑๐(๓)/ ๘๓ ๔ ๕ ลงวันที่ ๐๕ ตุลาคม ๒๕๖๔

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๙ รายการ

น้ำได้ดิน จำนวน ๔ รายการ

ลำดับที่	ชนิดสารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
2	Copper	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
3	Iron	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
4	Molybdenum	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

ดิน จำนวน ๕ รายการ

ลำดับที่	ชนิดสารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method <sup>(2,3)</sup>
2	Copper	Digestion, Inductively Coupled Plasma Method <sup>(2,3)</sup>
3	Iron	Digestion, Inductively Coupled Plasma Method <sup>(2,3)</sup>
4	Molybdenum	Digestion, Inductively Coupled Plasma Method <sup>(2,3)</sup>
5	pH	Electrometric Method <sup>(4)</sup>

เอกสารอ้างอิง

1. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24<sup>th</sup> ed. Washington, DC : APHA, 2023
2. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments, Sludges, and Soils. SW-846 Method 3050B, 1996.
3. United States Environmental Protection Agency. Inductively Coupled Plasma - Atomic Emission Spectrometry. SW-846 Method 6010C, 2007
4. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soil and Waste pH. SW-846 Method 9045D, 2004.





ไบอณณาต

ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๔-๐๐๐๘๕

เลขทะเบียนนิติบุคคล ๐๒๐๕๕๕๓๕๐๐๔๕๗๘๘

ตั้งอยู่ เลขที่ ๙๙๙ หมู่ที่ ๑๑ ตำบลหนองขาม อำเภอศรีราชา จังหวัดชลบุรี.

ทั้งนี้ ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

John C. Smith

(นายกิตติ์ติลปี่ ตูลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



ใบอนุญาตนเลขที่ ๐๒๐๑-๐๓-๒๕๖๔-๐๐๘

๑. นางวรรณเพ็ญ	เหลาจินดาภิรมย์
๒. นางสาวกรนิพัทร	กสินโสภณ
๓. นายธงชัย	บุญศักดิ์
๔. นายวิชญ์วัธน์	สิริเทวี
๕. นายโอภา	ชัยศิริมงคล
๖. นายธีรพงษ์	นวลอินทร์
๗. นายรกรกร	ไวทยะเสวี
๘. นายณิพัล	ทองหล่อ
๙. นายสุทธา	สองอินัย
๑๐. นายธรรมรัตน์	โพธิ์คันคำ
๑๑. นายณิ	สุประเสริฐรัฐ
๑๒. นายศมกฤษ	ครรลอน
๑๓. นายราธิป	สงวนศิลป์
๑๔. นายวิรัชชัย	พอใจ
๑๕. นางสาวนันทภา	อุบลเงิน
๑๖. นางสาวจันทินี	สายพันธ์
๑๗. นายทรงพล	ผิวอ้วน
๑๘. นายศุภกิจ	พุดกลาง
๑๙. นางสาวพรนภา	พงษ์เพชร
๒๐. นางสาวจุฑารัตน์	สุทธาเขต
๒๑. นางสาวจิตา	กิตติเนาวรัตน์
๒๒. นางสาวอรอนงค์	สังข์ศักดิ์
๒๓. นางสาวปภาดา	เจริญพร
๒๔. นายวราวุธ	อารีเอื้อ

4/17

๒๕. นายศุภกร  
๒๖. นายศุภชัย

นพพรพิทักษ์  
ภราดร

ทั้งนี้ ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๗



(นายศักดิ์สิทธิ์ ศิลป์ ตูลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายชื่อบุคลากร (เพิ่มเติม)  
แนบท้ายใบอนุญาตเป็นนิติบุคคลให้ผู้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตราย  
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย  
ของบริษัท อีสเทิร์น ไทย คอนกรีตติ้ง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๕๔-๐๐๐๘

๑. นางสาวรัตมณี นาคเกตุ  
๒. นางสาวดวงใจ แยมประโคน

ทั้งนี้ ตั้งแต่วันที่ ๒๒ พฤษภาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๒ พฤษภาคม พ.ศ. ๒๕๖๘



(นายศักดิ์สิทธิ์ ศิลป์ ตูลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

Copy

Copy

รายชื่อบุคลากร (เพิ่มเติม)

แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตราย  
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด

ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๔-๐๐๐๘

๑. นายวิทยา แสนดอ
๒. นางสาวณุลล โนนหิน
๓. นางสาววรรณดี เสาวรส
๔. นางสาวจิรฉัตร พันธ์นา
๕. นางสาวชรีรินทร์ พุทธา

ทั้งนี้ ตั้งแต่วันที่ ๒๔ ธันวาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๔ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ดุลาธร)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายการเครื่องมือตรวจวัดแบบห้วยใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน  
และสถานที่เก็บรักษาสารเคมีอันตราย

ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด

ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๔-๐๐๐๘

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๑	เครื่องมือเก็บตัวอย่างอากาศ (Personal Air Sampling Pump)	ยี่ห้อ รุ่น Serial No.	๑๑
		Gilian GilAir-5	
		20040902003	
		20040902004	
		20100401018	
		20100401019	
		20100401020	
		20100401021	
		20100401022	
		20100401023	
		20100401024	
		20100401025	
		20100402002	
		Gilian	
		GilAir-3	
		20150302001	
		20150302002	๑๕
		20150302003	
		20150302004	
		20150302005	
		20160502011	
		20160502012	
		20160502013	
		20160502014	
		20160502015	
		20160502016	
		20160502017	

COPY



ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๑	เครื่องมือเก็บตัวอย่างอากาศ (Personal Air Sampling Pump) (ต่อ)	Serial No. 20160502018 20160502019 20160502020	๓๔
		ยี่ห้อ รุ่น Serial No. Gilian BDX-II 20180903076 20180903078 20180903079 20180903080 20180903081 20180903082 20180903083 20180903084 20180903085 20180903092 20180903093 20180903094 20181001041 20181001042 20181001044 20200403061 20200403062 20200403063 20200403064 20200403065 20200403071 20200403072 20200403073 20200403074 20200403075 20200403076	

COPY

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๑	เครื่องมือเก็บตัวอย่างอากาศ (Personal Air Sampling Pump) (ต่อ)	Serial No. 20200403077 20200403078 20200403079 20200403080 20211102097 20211102098 20211102099 20211102103 20211102105 20211102125 20211103003 20211103024 20211103029	๑๕
		ยี่ห้อ รุ่น Serial No. SKC Pocket Pump TOUCH 218383 218385 218388 218391 218402 218403 218405 218406 218408 218411 218412 218413 218432 218444 218445	

COPY

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๒	เครื่องมือและอุปกรณ์สำหรับ ปรับความถูกต้อง (Pump calibrator)	ยี่ห้อ รุ่น Serial No.	๑
		ยี่ห้อ รุ่น Serial No.	

ทั้งนี้ ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗



(นายศักดิ์ศิลป์ ดุลาธร)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



แบบ ภก.บญ  
นิติศก๙

กรมสวัสดิการและคุ้มครองแรงงาน  
ใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการเคราะห้ระดับความเข้มข้นของสารเคมีอันตราย  
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ใบอนุญาตเลขที่ ๑๒๐๒๒-๐๓-๒๕๖๕-๐๐๐๕

อนุญาตให้ นริษฐ์ ลีสินธิรินทร์ ไทยคอนสตรัคชั่น 1992 จำกัด

เลขทะเบียนนิติบุคคล ๐๒๐๕๕๓๕๐๐๔๕๗๘  
ตั้งอยู่ เลขที่ ๙๙๙ หมู่ที่ ๑๑ ตำบลหนองทวม อำเภอศรีราชา จังหวัดชลบุรี  
เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม  
ในการทำงานเกี่ยวกับการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม  
ของสารเคมีอันตรายเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๖๖ ในการเป็นผู้ให้บริการวิเคราะห์ระดับความเข้มข้น  
ของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย ประกอบกับ  
กฎกระทรวงกั้นพื้นที่อันตรายและกำหนดให้ผู้ให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม  
ในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน  
พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๒๕ ราย และรายการเครื่องมือวิเคราะห์ จำนวน ๑๒ เครื่อง ดังรายละเอียด  
แนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗



(นายศักดิ์ศิลป์ ดุลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

Copy

Copy

เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน  
รายชื่อบุคลากรแบบท้ายใบอนุญาต  
และสถานที่เก็บก๊าซสารเคมีอันตราย  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคชั่น 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๔-๐๐๐๕

- |                               |  |
|-------------------------------|--|
| ๑. นายกะวีร์ สุราทิพย์        |  |
| ๒. นางสาวนันทน์กัณท์ บุญทด    |  |
| ๓. นางสาวกัลลันท์ ป้อมน้อย    |  |
| ๔. นางสาวอัญฉวี จิตตะไธธร     |  |
| ๕. นางสาววรรณภา ไชยศิริ       |  |
| ๖. นางสาวพรพิมล ภูมิคอนสาร    |  |
| ๗. นางสาวฉววรรณ ผล่อ          |  |
| ๘. นายภานุพงศ์ บำรุงส         |  |
| ๙. นางสาวฉัตรสุดา มงคลโกชน์   |  |
| ๑๐. นางสาวอริศรียะ ชื่นอารมย์ |  |
| ๑๑. นายชนูวัฒน์ ไชยวงศ์       |  |
| ๑๒. นางสาวพจนิษฐ์ งานวิสัย    |  |
| ๑๓. นางสาวบุญเรือง บุญณ       |  |
| ๑๔. นางสาวภาณีน จันดีะสอน     |  |
| ๑๕. นางสาวสุวิษา เสงี่ยม      |  |
| ๑๖. นางสาวอัญลักษณ์ ชันโต     |  |
| ๑๗. นางสาวณัฐวิทย์ อัมมตทัศน์ |  |
| ๑๘. นางสาวระพีณ อินัน         |  |
| ๑๙. นางสาวสุเมธิดา มีแก่น     |  |
| ๒๐. นางสาวอรุษา พันธุ์เมือง   |  |
| ๒๑. นายกิตติ ไพโรจน์          |  |
| ๒๒. นายบุญณรงค์ ดั่งธรรมรักษ์ |  |
| ๒๓. นางสาวดวงมณี เนื่อทอง     |  |

๒๔. นางสาวคณินญา...

COPY

- |                            |  |
|----------------------------|--|
| ๒๔. นางสาวคณินญา โสเดลี    |  |
| ๒๕. นางสาววัชรภรณ์ อินทสุข |  |
- ทั้งนี้ ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐  
ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗

(นายศักดิ์ศิลป์ ดุลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายการเครื่องมือวิเคราะห์แบบหัตถ์โดยอัตโนมัติ  
เป็นนิมิตรคณูให้บริการวิเคราะห์ความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน  
และสถานที่เก็บรักษาสารเคมีอันตราย  
ของบริษัท อีสเทิร์น ไทย คอนสตรัค 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๔-๐๐๐๕

ลำดับที่	รายการเครื่องมือ	รายละเอียด			จำนวน (เครื่อง)
๑	Atomic Absorption Spectrophotometer (AAS)	ยี่ห้อ รุ่น Serial No.	PerkinElmer PinAcle 900F PFB522080801		๑
๒	Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)	ยี่ห้อ รุ่น Serial No.	Teledyne Prodigy 7 P70177		๑
๓	Gas Chromatograph (GC-FID)	ยี่ห้อ รุ่น Serial No.	PerkinElmer Avio 550 Max M8152210101		๑
๔	Gas Chromatography (GC-MS)	ยี่ห้อ รุ่น Serial No.	Shimadzu GC-2010 Plus C1209520086		๑
๕	Ion Chromatography (IC)	ยี่ห้อ รุ่น Serial No.	Agilent 7890A CN10051046		๑
๖	UV-VIS Spectrophotometer	ยี่ห้อ รุ่น Serial No.	Shimadzu QP2020 NX 021745801748		๑
		ยี่ห้อ รุ่น Serial No.	Thermo Dionex Integration RFIC 20053176		๑
		ยี่ห้อ รุ่น Serial No.	Shimadzu UV-1800 A11635101643CD		๑

COPY

ลำดับที่	รายการเครื่องมือ	รายละเอียด			จำนวน (เครื่อง)
		ยี่ห้อ รุ่น Serial No.	Mettler-Toledo XS205DU 1126323724		
๗	เครื่องชั่ง (Electronic Balance)	ยี่ห้อ รุ่น Serial No.	Testo Testo 350 60378478 63455658 63455616		๑
๘	Flue Gas Analyzer	ยี่ห้อ รุ่น Serial No.			๓
	หมายเหตุ เครื่องมือลำดับที่ ๘ ใช้สำหรับการวิเคราะห์คาร์บอนมอนอกไซด์ (Carbon monoxide: CO) ภายในห้องปฏิบัติการเท่านั้น				

ตั้งแต่วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๖ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗

(นายศักดิ์ศิลป์ ตูลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

✓

COPY





แบบ กบ.ญ  
ชนิด.ดล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับความร้อน

ใบอนุญาตเลขที่ ๑๕๑๑๑-๑๓๖-๒๕๖๔-๐๐๑๙

อนุญาตให้...บริษัท อีสเทิร์น ไทย คอนสตรัคชั่น จำกัด...

เลขทะเบียนนิติบุคคล...๐๒๐๕๕๓๕๐๐๔๙๙๘

ตั้งอยู่เลขที่...๙๕๔ หมู่ที่ ๑๑ ตำบลหนองขน อำเภอสว่างวีระ จังหวัดสุรินทร์

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวง กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๔ ในการตรวจวัดและวิเคราะห์สภาพการทำงาน ในการปฏิบัติงานเกี่ยวกับความร้อน ประกอบกับกฎกระทรวงการขึ้นทะเบียนและกระอนุญาติให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๐ ราย และรายการเครื่องมือ ตรวจวัด จำนวน ๑๔ เครื่อง ดังรายละเอียดแบบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๓ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๓

(นายศักดิ์ศิลป์ ตูลาธร)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

copy

รายชื่อบุคลากรแนบท้ายใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับความร้อน  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคชั่น 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๑๐๓-๒๕๖๔-๐๐๑๙

- |                    |                |
|--------------------|----------------|
| ๑. นางวรรณเพ็ญ     | เหลาจินดาวัฒน์ |
| ๒. นางสาวนันทพร    | กลั่นโสภณ      |
| ๓. นางสาวนันทดา    | ร่มรุกข์       |
| ๔. นางสาวอภิรดี    | ชื่นอารมย์     |
| ๕. นางสาวธัญลักษณ์ | ชนโด           |
| ๖. นางสาวจุฑารัตน์ | สุชะเกต        |
| ๗. นางสาวศวีดา     | กิตติเนาวรัตน์ |
| ๘. นางสาวพรนภา     | พงษ์เพชร       |
| ๙. นางสาวอรอนงค์   | สิริวงศ์ศักดิ์ |
| ๑๐. นายสุกัญญา     | ภากรการ        |

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๓ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๓

(นายศักดิ์ศิลป์ ตูลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

copy

รายชื่อบุคลากร (เพิ่มเติม) แบบท้ายใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับความร้อน  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๑-๐๓-๒๕๖๔-๐๐๐๙

๑. นางสาวรัตณี นาคเกตุ  
๒. นางสาวดวงใจ แยมประโคน

ทั้งนี้ ตั้งแต่วันที่ ๒ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๕ มิถุนายน พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตุลาธร)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายชื่อบุคลากร (เพิ่มเติม)  
แบบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับความร้อน  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๑-๐๓-๒๕๖๔-๐๐๐๙

๑. นางสาวณมล โนนหิน  
๒. นางสาวรภกานต์ เสาวรส  
๓. นางสาวจิรณัมพร พันธนา  
๔. นางสาวศศิรินทร์ พุทธา

ทั้งนี้ ตั้งแต่วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตุลาธร)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายการเครื่องมือตรวจวัดแบบท้าวใบอนุญาต  
เป็นมีบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับความร้อน  
ของบริษัท อีสเทิร์น ไทย คอร์ปอเรชั่น จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๑๐๓-๒๕๖๔-๐๐๐๔

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๑	อุปกรณ์ตรวจวัดระดับความร้อน ชนิดอิเล็กทรอนิกส์ที่สามารถอ่าน และคำนวณค่าอุณหภูมิแบบไร้สาย (WBGT)	ยี่ห้อ TSI QUEST	๑
		รุ่น QUESTemp <sup>32</sup>	
		Serial No. TPH060001	
		มาตรฐาน ISO 7243	
		ยี่ห้อ QUEST TECHNOLOGIES	๒
		รุ่น QUESTemp <sup>32</sup>	
		Serial No. TP050069	
		TP050070	
		มาตรฐาน ISO 7243	๒
		ยี่ห้อ 3M	
		รุ่น QUESTemp <sup>32</sup>	
		Serial No. TPL060039	
		TPL060040	๕
		TPL090016	
		TPL090017	
		TPQ030023	
		TPQ030024	
		มาตรฐาน ISO 7243	๕
		ยี่ห้อ TSI QUEST	
		รุ่น QUESTemp <sup>34</sup>	
		Serial No. TEU080011	
		TEU080012	๕
		TEU080013	
		TEU080014	
		TEU080015	
		มาตรฐาน ISO 7243	



ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ		
	อุปกรณ์ตรวจวัดระดับความร้อน ชนิดอิเล็กทรอนิกส์ที่สามารถอ่าน และคำนวณค่าอุณหภูมิแบบไร้สาย (WBGT) (ต่อ)	รุ่น	DELTA OHM HD32.2	๔
		Serial No.	22004316	
			22004318	
			22004319	
			22004320	
		มาตรฐาน	ISO 7243	

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๓ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐  
ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๓

(นายศักดิ์ศิลป์ ดุลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน





แบบ กก.บญ  
นิติบุคคล

#### กรมสวัสดิการและคุ้มครองแรงงาน

##### ใบอนุญาต

### เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับแสงสว่าง

ใบอนุญาตเลขที่ ๐๔๐๒๐๓-๒๕๖๕-๐๐๐๙

อนุญาตให้...บริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด

เลขทะเบียนนิติบุคคล...๐๒๐๕๔๓๔๐๐๔๕๔๔

ตั้งอยู่เลขที่...๘๔๔ หมู่ที่ ๑๑ ตำบลหนองขน อำเภอศรีราชา จังหวัดชลบุรี

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม  
กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม  
ในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๔ ในการตรวจวัดและวิเคราะห์สภาพการทำงาน  
เกี่ยวกับระดับแสงสว่าง ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม  
ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย  
อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๐ ราย และรายการเครื่องมือ  
ตรวจวัด จำนวน ๗ เครื่อง ดังรายละเอียดแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๗

(นายศักดิ์ศิลป์ ตูลาธ)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

#### รายชื่อบุคลากรแนบท้ายใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับแสงสว่าง

ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด

ใบอนุญาตเลขที่ ๐๔๐๒๐๓-๒๕๖๕-๐๐๐๙

- |                    |                |
|--------------------|----------------|
| ๑. นางวรรณเพ็ญ     | เหลาจินดาวัดน์ |
| ๒. นางสาวธนัชพร    | กลั่นโสมณ      |
| ๓. นางสาวปนัดดา    | ร่มฤทธิ์       |
| ๔. นางสาวอภิสรา    | ชีนอารมย์      |
| ๕. นางสาวอัญชลิณี  | ชินโต          |
| ๖. นางสาวจุฑารัตน์ | สุขานาถ        |
| ๗. นางสาวศศิตา     | กิตตินาวรัตน์  |
| ๘. นางสาวพรนภา     | พงษ์เพชร       |
| ๙. นางสาวอรอนงค์   | สิงค์ศักดิ์    |
| ๑๐. นายศุภชัย      | ภาการ          |

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๗

(นายศักดิ์ศิลป์ ตูลาธ)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



รายชื่อบุคลากร (เพิ่มเติม) แบบท้ายใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับแสงสว่าง  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๔-๐๐๐๙

๑. นางสาวรัตมณี นาคเกตุ
๒. นางสาวดวงใจ แย้มประโคน

ทั้งนี้ ตั้งแต่วันที่ ๒๕ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๕ มิถุนายน พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตูลาธร)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายชื่อบุคลากร (เพิ่มเติม)  
แบบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับแสงสว่าง  
ของ บริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๔-๐๐๐๙

๑. นางสาวณมล โนนหิน
๒. นางสาววรกานต์ เสาวรส
๓. นางสาวจริมนพร พันธนา
๔. นางสาวศรินทร พุทธา

ทั้งนี้ ตั้งแต่วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตูลาธร)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

COPY

รายการเครื่องมือตรวจวัดแบบพกพาใบอนุญาต  
เป็นมีบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับแสงสว่าง  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๔-๐๐๐๙

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๑	เครื่องวัดแสง	ยี่ห้อ DIGICON	๓
		รุ่น LX-72	
		Serial No. Q606371	
		Q606412	
		Q608662	๒
		มาตรฐาน CIE	
		ยี่ห้อ DIGICON	
		รุ่น LX-73	
		Serial No. S.008890	
		R.032544	
		มาตรฐาน CIE	๒
		ยี่ห้อ TENMARS	
		รุ่น TM-209M	
		Serial No. 220800468	
		230203566	
		มาตรฐาน JIS C 1609	

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๗



(นายศักดิ์ศิลป์ ตูลาธร)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



รายการเครื่องมือตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับแสงสว่าง (เพิ่มเติม)  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๔-๐๐๐๙

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ		
		รุ่น		
		Serial No.		
๑	เครื่องวัดแสง	X1001377		๔
		X1001380		
		Y1001188		
		Y1001191		
		มาตรฐาน JIS C 1609		

ทั้งนี้ ตั้งแต่วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตูลาธร)

รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



รายการเครื่องมือตรวจวัดและวิเคราะห์ผลการการทำงานเกี่ยวกับระดับแสงสว่าง (เพิ่มเติม)

ของ บริษัท อีสเทิร์น ไทย คอนดัคติ้ง 1992 จำกัด

ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๔-๐๐๐๔

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ		
๑	เครื่องวัดแสง	รุ่น	KYORITSU	๔
		Serial No.	5202	
			X1001377	
			X1001380	
			Y1001188	
		Y1001191		
		มาตรฐาน	JIS C 1609	

ทั้งนี้ ตั้งแต่วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ จุลสาร)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



แบบ กภ.บญ  
นิตยภัต

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลให้บริการตรวจวัดและวิเคราะห์ผลการการทำงานเกี่ยวกับระดับเสียง

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๔-๐๐๐๕

อนุญาตให้... บริษัท อีสเทิร์น ไทย คอนดัคติ้ง 1992 จำกัด

เลขทะเบียนนิติบุคคล ๐๒๐๕๕๕๐๔๐๐๔๕๗๘

ตั้งอยู่เลขที่ ๕๕๕ หมู่ที่ ๑๑๑ ตำบลหนองขาม อำเภอศรีราชา จังหวัดชลบุรี

เป็นนิติบุคคลให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับความเสี่ยง ประเภทรองการขึ้นทะเบียนและการอนุญาตให้วิศวกรตรวจสอบและวิเคราะห์ผลการการทำงานเกี่ยวกับระดับเสียง และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ ในการตรวจวัดและวิเคราะห์ผลการการทำงานเกี่ยวกับระดับเสียง ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้วิศวกรตรวจสอบและวิเคราะห์ผลการการทำงาน พ.ศ. ๒๕๖๔ โดยมีบุคลากร จำนวน ๑๐ ราย และรายการเครื่องมือตรวจวัดและสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยไม่บุคลากร จำนวน ๑๐ ราย และรายการเครื่องมือตรวจวัดจำนวน ๗๔ เครื่อง ดังรายละเอียดแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ จุลสาร)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



รายชื่อบุคลากรแบบท้ายใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการปฏิบัติงานเกี่ยวกับระดับเสียง

ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๐๕

๑. นางวรรณเพ็ญ เหลาจินดาวัฒน์
๒. นางสาวณัฏพร กลิ่นโสมณ
๓. นางสาวปนัดดา รมภักซ์
๔. นางสาวอริสดี ชื่นอารมย์
๕. นางสาวธัญลักษณ์ ชันโต
๖. นางสาวจุฑารัตน์ สุขเขาเขต
๗. นางสาวศविตา กิตติเนาวรัตน์
๘. นางสาวพรหมภา พงษ์เพชร
๙. นางสาวอรอนงค์ สิวงค์ศักดิ์
๑๐. นายศุภชัย ภากรกร

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๗ ธันวาคม พ.ศ. ๒๕๖๗



(นายศักดิ์ศิลป์ ตูลาธร)

ผู้ตรวจราชการกรม ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



รายชื่อบุคลากร (เพิ่มเติม) แบบท้ายใบอนุญาต  
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์ผลการปฏิบัติงานเกี่ยวกับระดับเสียง  
ของบริษัท อีสเทิร์น ไทย คอนสตรัคติง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๐๕

๑. นางสาวรัตณี นาคเกตุ
๒. นางสาวดวงใจ แยมประโคน

ทั้งนี้ ตั้งแต่วันที่ ๒ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๔ มิถุนายน พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตูลาธร)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน





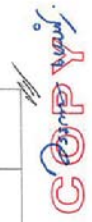
แบบท้ายใบอนุญาตเป็นมีติดบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง  
ของบริษัท อีสท์ริ่ม ไทย คอนซัลติ้ง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๔-๐๐๐๔

รายการเครื่องมือตรวจวัดแบบท้ายใบอนุญาต  
เป็นมีติดบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง  
ของบริษัท อีสท์ริ่ม ไทย คอนซัลติ้ง 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๔-๐๐๐๔

- ๑. นางสาวณมล โนนหิน
  - ๒. นางสาวรณกานต์ เสาวรส
  - ๓. นางสาวจิรนนพร พันธนา
  - ๔. นางสาวศิรินพร พุทธา
- ทั้งนี้ ตั้งแต่วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๔ ถึงวันที่ ๒๔ ธันวาคม พ.ศ. ๒๕๖๔

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๔

(นายศักดิ์ศิลป์ ดุลาธร)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ	รุ่น	
๑	เครื่องวัดเสียง และ เครื่องวัดเสียงกระทบเพื่อเสียงกระแทก	Serial No.	00209079	๑๐
			00310455	
			00310456	
			00310458	
			00443357	
		มาตรฐาน	IEC 61672	๓
			RIION	
			NL-42	
			01147298	
			01147299	
		Serial No.	01147300	๗
			IEC 61672	
			CIRRU	
			CR-172A	
			G300957	
		มาตรฐาน	IEC 61672	
			RIION	
			NL-42	
			01147298	
			01147299	

-๒-

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ	รายละเอียด	
๒	เครื่องวัดเสียง และ เครื่องวัดสปีดเสียงหรือเสียงกระทบ (ต่อ)	ยี่ห้อ	RION	๑๗
		รุ่น	NL-42A	
		Serial No.	00222592	
			00222593	
			00222594	
			00322744	
			00322745	
			00322746	
			00322747	
			00322748	
			00322749	
			00322750	
			00322751	
๒	เครื่องวัดปริมาณเสียงสะสม	มาตรฐาน	IEC 61672	๑
		ยี่ห้อ	TES	
		รุ่น	1355	
		Serial No.	070204292	
		มาตรฐาน	IEC 61252	
		ยี่ห้อ	3M	
		รุ่น	NoisePro DLX	
		Serial No.	NXL060044	
			NXL060045	
			NXL060046	
			NXL060048	
			NXX070006	
			NXX070007	
			NXX070008	
		มาตรฐาน	IEC 61252	

-๓-

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ	รายละเอียด	
	เครื่องวัดปริมาณเสียงสะสม (ต่อ)	ยี่ห้อ	CIRRUS	๒๐
		รุ่น	CR-110A	
		Serial No.	CA8879	
			CA8886	
			CA8887	
			CA8888	
			CA8889	
			CB0640	
			CB0641	
			CB0642	
			CB0643	
			CB0644	
			CB0954	
๓	อุปกรณ์ตรวจสอบความถูกต้อง	มาตรฐาน	IEC 61252	๔
		ยี่ห้อ	RION	
		รุ่น	NC-75	
		Serial No.	34234715	
			34234716	
			34302326	
			34802645	
		มาตรฐาน	IEC 60942	

ลำดับที่	รายการเครื่องมือ อุปกรณ์ตรวจสอบความถูกต้อง (ต่อ)	รายละเอียด			จำนวน (เครื่อง)
		ยี่ห้อ	รุ่น		
		Serial No.	CR:517		๑
		มาตรฐาน	92863		
		IEC 60942			
		ยี่ห้อ	CIRBUS		
		รุ่น	RC:110A		
		Serial No.	73967		
		87366			๔
		92433			
		มาตรฐาน	IEC 60942		

ทั้งนี้ ตั้งแต่วันที่ ๓๐ ธันวาคม พ.ศ. ๒๕๖๗ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๓ ธันวาคม พ.ศ. ๒๕๖๗

(นายศักดิ์ศิลป์ ดุลาธร)  
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน  
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

ORP

รายการเครื่องมือตรวจวัด (เพิ่มเติม)  
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ใช้บริการตรวจวัดและวิเคราะห์ผลการทำงานเกี่ยวกับระดับเสียง  
ของบริษัท อีสเทิร์น ไทย คอมมูนิคัซ 1992 จำกัด  
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๔-๐๐๐๔

ลำดับที่	รายการเครื่องมือ เครื่องวัดเสียง และเครื่องวัดเสียง กระทบหรือเสียงกระแทก	รายละเอียด		จำนวน (เครื่อง)
		ยี่ห้อ	Rion	
๑		รุ่น	NL- 52A	๑๘
		Serial No.	01120943	
			01120944	
			01120945	
			01120947	
			01120948	
			01120949	
			01120950	
			01120952	
			01120953	
			00230985	
			00230986	
			00230987	
			00230988	
			00230989	
			00230992	
		มาตรฐาน	IEC 61672	๔
		ยี่ห้อ	Rion	
		รุ่น	NL- 43	
		Serial No.	00641700	
			00641701	
			00641702	
			00641703	
		มาตรฐาน	IEC 61672	
		ยี่ห้อ	Rion	๔
		รุ่น	NL- 53	

ORP

ลำดับที่	รายการเครื่องมือ	รายละเอียด	จำนวน (เครื่อง)
๒	อุปกรณ์ตรวจสอบความถูกต้อง	Serial No. 00741217	๕
		00741218	
		00741219	
		00741254	
		มาตรฐาน IEC 61672	
		ยี่ห้อ Rion	
		รุ่น NL- 75	
		Serial No. 34745929	
		34946010	
		34946011	
		34946012	
		34946013	
		มาตรฐาน IEC 60942	

ทั้งนี้ ตั้งแต่วันที่ ๒ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๒๙ ธันวาคม พ.ศ. ๒๕๗๐

ให้ไว้ ณ วันที่ ๒๕ มิถุนายน พ.ศ. ๒๕๖๘



(นายศักดิ์ศิลป์ ตูลาธร)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



บริษัท เอสจีเอส (ประเทศไทย) จำกัด

---



ที่ อก ๐๓๐๐(๓)/ ๑๐๓๗

ศูนย์วิจัยและเตือนภัยมลพิษโรงงาน  
ภาคตะวันออก  
๑๓/๔ หมู่ ๗ ตำบลหนองช้างคอก  
อำเภอเมืองชลบุรี จังหวัดชลบุรี ๒๐๐๐๐

๑ ตุลาคม ๒๕๖๘

เรื่อง แจ้งกำหนดการตรวจสอบการดำเนินงานของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการบริษัท เอสจีเอส (ประเทศไทย) จำกัด ระวัง

อ้างถึง คำขอต่ออายุของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๑ สิงหาคม ๒๕๖๘

ตามที่อ้างถึง บริษัท เอสจีเอส (ประเทศไทย) จำกัด ระวังของ สถานที่ตั้งเลขที่ ๑/๒๐๔ และ ๑/๒๐๕ หมู่ที่ ๑ ตำบลบ้านฉาง อำเภอบ้านฉาง จังหวัดระยอง ขอขึ้นต่ออายุห้องปฏิบัติการวิเคราะห์เอกชน รายการ น้ำเสีย/น้ำทิ้ง จำนวน ๔๔ รายการ น้ำได้ดิน ๑๒๓ รายการ อากาศ ๒๘ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว ๕๕ รายการ และดิน ๑๒๓ รายการ รวมทั้งสิ้น ๓๗๓ รายการ ความละเอียดแจ้งแล้ว นั้น

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กำหนดการตรวจสอบการดำเนินงานของห้องปฏิบัติการวิเคราะห์ เพื่อประกอบการพิจารณาขอต่ออายุห้องปฏิบัติการวิเคราะห์เอกชนให้เป็นไปตามประกาศกรมโรงงานอุตสาหกรรม เรื่อง ห้องปฏิบัติการวิเคราะห์เอกชน พ.ศ. ๒๕๖๖ โดยมอบหมายให้ นายทวีอำนาจพันธ์ ตำแหน่งนักวิทยาศาสตร์ชำนาญการพิเศษ และคณะฯ เป็นผู้ดำเนินการตรวจสอบการดำเนินงานของห้องปฏิบัติการวิเคราะห์ ณ ห้องปฏิบัติการของท่าน ในอังคารที่ ๗ ตุลาคม ๒๕๖๘ ระหว่างเวลา ๐๙.๐๐-๑๖.๓๐ น. หากมีข้อขัดข้องหรือต้องการข้อมูลเพิ่มเติมสามารถประสานงานกับเจ้าหน้าที่ช่างด้านตามเบอร์โทรศัพท์ ๐ ๓๓๑๓ ๖๐๕๕ ต่อ ๕๐๐๐ หรือทางโทรศัพท์เคลื่อนที่ ๐๘ ๖๖๕๔ ๓๗๗๘

จึงเรียนมาเพื่อโปรดทราบ และขอได้โปรดประสานงานกับเจ้าหน้าที่ที่เกี่ยวข้องเพื่อให้ข้อมูลและอำนวยความสะดวกให้แก่เจ้าหน้าที่ท่านที่สมควรตรวจเช็คข้อมูล

ขอแสดงความนับถือ

(นายทวี อำนาจพันธ์)

ผู้อำนวยการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

กลุ่มวิเคราะห์มลพิษและทะเบียนห้องปฏิบัติการ  
โทร. ๐ ๓๓๑๓ ๖๐๕๕ ต่อ ๕๐๐๐-๒  
ไปรษณีย์อิเล็กทรอนิกส์ einw@dw.mail.go.th



Green Industry “อุตสาหกรรมก้าวไกล ประเทไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”

คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน

วันที่ ๓1 เดือน สิงหาคม พ.ศ. 2568

เรียน อธิบดีกรมโรงงานอุตสาหกรรม

ข้าพเจ้า ☐ ผู้รับใบอนุญาตประกอบกิจการโรงงาน

☒ บริษัทห้างหุ้นส่วนจำกัด / บอส์ไฮโดร (ประเทศไทย) จำกัด

ผู้รับใบอนุญาตประกอบกิจการโรงงาน  
ภาคตะวันออก  
เลขที่ ๑๖๔  
วันที่ ๑๙ ส.ค. ๒๕๖๘

สถานที่ตั้งห้องปฏิบัติการ

เลขที่ 1/204 และ 1/205 หมู่ที่ 1 ตระกอก/ขอย ถนน ตำบล/แขวง บ้านฉาง อำเภอ/เขต บ้านฉาง จังหวัด ระยอง รหัสไปรษณีย์ 21130 โทรศัพท์ E-mail เลขทะเบียนห้องปฏิบัติการ ๑-194

ได้รบกวน ประกาศกรมโรงงานอุตสาหกรรม เรื่อง ห้องปฏิบัติการวิเคราะห์เอกชน พ.ศ. 2566 โดยตลอดแล้ว และยินยอมปฏิบัติตามประกาศฯ ทุกประการ และได้แนบเอกสารต่างๆ ตามรายการเอกสารประกอบการพิจารณา (แบบ ปอ.1-1) มาพร้อมนี้

รายการขอขึ้นทะเบียน

การดำเนินการ	จำนวนสารมลพิษ				รวมทั้งสิ้น (รายการ)
	น้ำเสีย/น้ำทิ้ง (รายการ)	น้ำได้ดิน (รายการ)	อากาศ (รายการ)	สิ่งปฏิกูลหรือ วัสดุที่ไม่ใช้ แล้ว(รายการ)	ดิน (รายการ)
<input type="checkbox"/> ขอขึ้นทะเบียนห้องปฏิบัติการ วิเคราะห์เอกชน					
<input checked="" type="checkbox"/> ต่ออายุห้องปฏิบัติการ วิเคราะห์เอกชน	44	123	28	55	373
<input type="checkbox"/> เปลี่ยนแปลงสารมลพิษที่ วิเคราะห์ <input type="radio"/> เพิ่มสารมลพิษ <input type="radio"/> ยกเลิกสารมลพิษ					
<input checked="" type="checkbox"/> เปลี่ยนแปลงบุคลากร <input checked="" type="radio"/> เพิ่มบุคลากร <input type="radio"/> ยกเลิกบุคลากร	จำนวน 1 ราย (รายละเอียดตาม แบบ ปว.1) จำนวน 1 ราย (รายละเอียดตาม แบบ ปว.1-1)				
<input type="checkbox"/> ยกเลิกห้องปฏิบัติการวิเคราะห์เอกชน					
<input type="checkbox"/> อื่นๆ โปรดระบุ.....					

จึงเรียนมาเพื่อโปรดพิจารณา

Rev.00 (01/2567)

กรมโรงงานอุตสาหกรรม

หน้า 1/1





ลงชื่อ

(ผู้ว่าราชการจังหวัด)

ผู้มีอำนาจลงนามแทน

ประทับตรา (ถ้ามี)



ที่ อก ๐๒๐๐/๑๖๐๔๑

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑ พฤศจิกายน ๒๕๖๕

เรื่อง ค่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
เรียน กรรมการผู้จัดการ บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาระยอง)  
อ้างถึง คำขอต่ออายุของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๒ กันยายน ๒๕๖๕  
สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับค่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาระยอง) จำนวน ๒๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาระยอง) ขอต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๗ สถานที่ตั้งเลขที่ ๑/๒๐๙ และ ๑/๒๑๑ หมู่ที่ ๑  
ตำบลบ้านฉาง อำเภอบ้านฉาง จังหวัดระยอง ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาระยอง)  
ค่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นางสาวสายใจ เรืองสวัสดิ์ ทะเบียนเลขที่ ๖-๑๕๗-ค-๐๐๐๑  
๒) นางสาวพรณิภา สมจิตต์ ทะเบียนเลขที่ ๖-๑๕๗-ค-๐๐๐๒  
๓) นายณัฐวัฒน์ ศิริโชติ ทะเบียนเลขที่ ๖-๑๕๗-ค-๐๐๐๓  
๔) นายภาสกร สุนทรวีภาด ทะเบียนเลขที่ ๖-๑๕๗-ค-๐๐๐๔  
๕) นายเทพสัน ยมนา ทะเบียนเลขที่ ๖-๑๕๗-ค-๐๐๐๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวนิภาพร ปัตติชัย ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๑  
๒) นายวรินทร์ เสงี่ยมงาม ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๒  
๓) นายเศกสรร กลิ่นเกษร ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๓  
๔) นายวัชรรัฐ ลิ้มจิ ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๔  
๕) นายศุภฤกษ์ คล่องผจญกิจ ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๕  
๖) นางสาวพนิดา วรรณบุตร ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๖  
๗) นายสุรศักดิ์ อุดมุล ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๗  
๘) นายสมบ่อง มาตขุนทด ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๘  
๙) นายณวัฒน์ ชัยเลิศ ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๐๙  
๑๐) นายวิจิตร ชวัญดี ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๑๐  
๑๑) นายอนันต์กร นันทแสง ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๑๑  
๑๒) นายณัฐพล ตาปราบ ทะเบียนเลขที่ ๖-๑๕๗-จ-๐๐๑๒

๑๓) นายเฉลิมวุฒิ...

- ๑๓) นายเฉลิมวุฒิ ภูมิคม
- ๑๔) นายกรวิชัย มาลากุล ณ อยุธยา
- ๑๕) นายวีระเดช คนแรง
- ๑๖) นายพัลลภ ศรีอำบุญ
- ๑๗) นายปรีดา เกษปทุม
- ๑๘) นางสาวณิษฐา ไชยะเจ
- ๑๙) นายสกลพร ทองวงค์ญาติ
- ๒๐) นายสุภชัย พิตลประชารักษ์
- ๒๑) นายปฏิวัฒน์ ทัพยัต
- ๒๒) นายชัชวาล รุ่งเหลย
- ๒๓) นายณัฐ พงษ์วิชัย
- ๒๔) นางสาวสุภาณดา เกื้อส่องแสง
- ๒๕) นายโอฬาร บุญพันธ์
- ๒๖) นายมังกรแมน ศิริโชติ
- ๒๗) นายกิตติคุณ ทาสีเพชร
- ๒๘) นายชาวลิต ศรีเนน
- ๒๙) นายพรรัตน์ จำปานม
- ๓๐) นายสุริยะ ศรีโพธิ์
- ๓๑) นางสาวสิริรัตน์ แซ่ลิ้ม
- ๓๒) นางสาวหทัยรัตน์ ลินส์

ค. ขอขยาสารมลพิษที่ได้รับขึ้นทะเบียนในน้ำเสีย จำนวน ๔๔ รายการ การ  
น้ำใต้ดิน จำนวน ๑๒๓ รายการ อากาศเสีย (ปล่องระบาย) จำนวน ๒๘ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว  
จำนวน ๓๗ รายการ และดิน จำนวน ๑๒๓ รายการ รวมทั้งสิ้นจำนวน ๓๔๔ รายการ ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๒ ตุลาคม ๒๕๖๘ หากประสงค์จะต่ออายุหนังสือ  
รับขึ้นทะเบียนเพื่อปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงาน  
อุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนเพื่อปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอ  
ต่ออายุดังกล่าวขอรับได้ทั้งกรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ทั้งนี้  
เว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทวี อำพาพันธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
ปฏิบัติการทางแทนอธิบดีกรมโรงงานอุตสาหกรรม



ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๐๑-๖

ไปรษณีย์อิเล็กทรอนิกส์ [env@dw.mail.go.th](mailto:env@dw.mail.go.th)



"อุตสาหกรรมก้าวหน้า ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์



เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนเพื่อปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาระยอง)  
เลขทะเบียน ๖-๑๙๗  
ลงวันที่ ๑ พฤศจิกายน ๒๕๖๕

ขอขยาสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๔๔ รายการ  
นี้เสีย จำนวน 44 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
2	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
3	Barium	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
5	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
6	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
7	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
8	Biochemical Oxygen Demand	5-Day BOD Test, Membrane Electrode Method <sup>(a)</sup>
9	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
10	Chemical Oxygen Demand	Closed Reflux, Thrimetric Method <sup>(a)</sup>
11	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
12	Color	ADMI Weighted – Ordinate Spectrophotometric Method <sup>(a)</sup>
13	Copper	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
14	Cyanide	Distillation, Colorimetric Method <sup>(a)</sup>
15	p,p'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
16	p,p'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
17	o,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
18	p,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
19	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>

Handwritten signature



ลำดับที่	สารเคมี	วิธีวิเคราะห์
20	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
21	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
22	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
23	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
24	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
25	Formaldehyde	Distillation, Colorimetric Method <sup>(3)</sup>
26	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
27	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
28	Hexavalent Chromium	Filtration, Colorimetric Method <sup>(4)</sup>
29	Lead	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
30	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
31	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
32	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
33	Nickle	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
34	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>(4)</sup>
35	pH	Electrometric Method <sup>(4)</sup>
36	Phenols	Distillation, Direct Photometric Method <sup>(4)</sup>
37	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
38	Temperature	Field Method <sup>(4)</sup>
39	Total Chromium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
40	Total Dissolved Solids	Dried at 180 °C <sup>(4)</sup>
41	Total Kjeldahl Nitrogen	Digestion, Distillation, Thrimetric Method <sup>(4)</sup>
42	Total Suspended Solids	Dried at 103-105 °C <sup>(4)</sup>
43	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method, Calculation <sup>(4)</sup>
44	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

หน้าถัดไป จำนวน 123 รายการ

ลำดับที่	สารเคมี	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	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
6	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
9	Benzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
10	Benzo(a)anthracene	Liquid-Liquid Extraction, 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	Digestion, Inductively Coupled Plasma 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	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>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
21	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
22	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
23	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
26	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
27	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
31	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
32	Chromium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
33	Chromium Hexavalent	Filtration, Colorimetric Method <sup>(4)</sup>
34	Chromium Trivalent	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation <sup>(4)</sup>
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
36	Cyanide	Distillation, Colorimetric Method
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
40	DTT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
41	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
42	Di-n-Butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
46	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
47	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
48	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
49	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
50	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
51	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
52	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
53	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
54	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
55	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
56	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
57	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
58	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>



ลำดับที่	สารเคมี	วิธีวิเคราะห์
59	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
60	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
61	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
62	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
63	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
64	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
65	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
66	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
67	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
68	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
69	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
70	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
71	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
72	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
73	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
74	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
75	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
76	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>

77 n-Hexane...



ลำดับที่	สารเคมี	วิธีวิเคราะห์
77	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
78	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
79	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
80	Lead	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
81	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
82	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(a)</sup>
83	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
84	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
85	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
86	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
87	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
88	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
89	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
90	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
91	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
92	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
93	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
94	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>
95	pH	Electrometric Method <sup>(a)</sup>
96	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a)</sup>

97 Phenol...



ลำดับที่	สารเคมี	วิธีวิเคราะห์
97	Phenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
98	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
99	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
100	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
102	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
103	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
105	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
106	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic Mass Spectrometric Method
107	TPH (C <sub>8</sub> -C <sub>10</sub> )	Purge and Trap, Gas Chromatographic Mass Spectrometric Method
108	TPH (C <sub>10</sub> -C <sub>33</sub> )	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
112	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
113	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
114	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
116	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

117 Vinyl...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
117	Vinyl acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
118	Vinyl chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
120	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
122	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(4)</sup>
123	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

## อากาศเสีย (ปล่องระบาย) จำนวน 28 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
4	Cadmium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
5	Carbon Monoxide	Instrumental Analyzer Method <sup>(5)</sup>
6	Chlorine	Isokinetic Sampling, Ion Chromatographic Method <sup>(7)</sup>
7	Chromium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
9	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
10	Cresol	Absorption Sampling, Gas Chromatographic Method <sup>(6)</sup>
11	Dioxin/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory <sup>(5)</sup>

12 Hydrogen...



ลำดับที่	สารเคมี	วิธีวิเคราะห์
12	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method <sup>(7)</sup>
13	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method <sup>(7)</sup>
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>(5)</sup>
15	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
16	Manganese	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapour Atomic Absorption Spectrometric Method <sup>(5)</sup>
18	Nickel	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
19	Opacity	Ringelmann's Method <sup>(1)</sup>
20	Oxides of Nitrogen	1) Absorption Sampling, Colorimetric Method <sup>(6)</sup> 2) Instrumental Analyzer Method <sup>(7)</sup>
21	Tellurium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
22	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>(7)</sup>
24	Selenium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
25	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>(5)</sup> 2) Instrumental Analyzer Method <sup>(5)</sup>
26	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>(6)</sup>
27	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(5)</sup>
28	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>(6)</sup>

สิ่งปลูกสรหรือวัตถุที่ไม่ใช่แล้ว จำนวน 37 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aldrin	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
7	Chlordane	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
8	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction Colorimetric Method; Calculation <sup>(10,17)</sup> 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>(2,10,17)</sup>
9	Chromium (VI)	1) Waste Extraction, Digestion, Colorimetric Method <sup>(10,17)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(10,17)</sup>
10	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
11	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>

12 Dieldrin...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
12	Dieldrin	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
13	DDD	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
14	DDE	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
15	DDT	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
16	2,4-D (2,4-Dichlorophenoxyacetic acid)	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
17	Endrin	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
18	Heptachlor	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
19	Kepone	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
21	Lindane	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(2,18)</sup> 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(18)</sup>
23	Methoxychlor	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
24	Mirex	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
26	Polychlorinated Biphenyls (PCBs)	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
27	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
28	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
29	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>

30 Silvex...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
31	Silvex; 2,4,5-Trichlorophenoxypropionic acid	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
33	Total Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction Colorimetric Method; Calculation <sup>(10,17)</sup> 2) Digestion, Inductively Coupled Plasma – Atomic Emission Spectrometry Method <sup>(8,15)</sup>
34	Toxaphene	Ultrasonic Extraction, Gas Chromatographic Method <sup>(12,20,21)</sup>
35	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(14,22)</sup>
36	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>
37	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8,15)</sup>

### 6. Arsenic...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
3	Aldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
4	Anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
6	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>
7	Atrazine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>
9	Benzo(a)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
10	Benzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
11	Benzo(b)fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
12	Benzo(k)fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
13	Benzoic acid	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
14	Benzo(a)pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
15	Benzo(g,h,i)perylene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>
17	Bis(2-Chloroethyl)ether	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
18	Bis(2-Ethylhexyl)phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
21	Butyl benzyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
22	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>
23	Carbazole	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>

26 Chlordane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
26	Chlordane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
27	p-Chloroaniline	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
31	2-Chlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
32	Chromium	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>
33	Chromium (III)	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation <sup>[9,10,15]</sup>
34	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>[10]</sup>
35	Chrysene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
36	Cyanide	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
37	2,4-D	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
38	DDD	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
39	DDE	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
40	DDT	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
41	Dibenzo(a,h)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
42	Di-n-Butyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>

44 1,3-Dichlorobenzene..



ลำดับที่	สารเคมี	วิธีวิเคราะห์
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
46	3,3-Dichlorobenzidine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
47	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
48	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
49	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
50	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
51	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
52	2,4-Dichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
53	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
54	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
55	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
56	Dieldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
57	Diethyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
58	2,4-Dimethylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
59	2,4-Dinitrophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
60	2,4-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
61	2,6-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
62	Di-n-octyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
63	Endosulfan	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
64	Endrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
65	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
66	Fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
67	Fluorene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
68	Heptachlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
69	Heptachlor epoxide	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
70	Hexachlorobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
71	Hexachloro-1,3-butadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
72	$\alpha$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
73	$\beta$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
74	$\gamma$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
75	Hexachlorocyclopentadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
76	Hexachloroethane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
77	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[14,22]</sup>
78	Indeno(1,2,3-cd)pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
79	Isophorone	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[23,24]</sup>
80	Lead	Digestion, Inductively Coupled Plasma Method <sup>[9,15]</sup>



ลำดับที่	สารเคมี	วิธีการตรวจ
81	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>
82	Mercury	Digestion, Cold vapor Atomic Absorption Spectrometric Method
83	Methoxychlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
84	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
85	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
86	2-Methylnaphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
87	2-Methylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
88	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
89	Naphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
90	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>
91	Nitrobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
92	N-Nitrosodiphenylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
93	N-Nitrosodi-n-propylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
94	Pentachlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
95	Phenanthrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
96	Phenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
97	Polychlorinated Biphenyls (PCBs)	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
98	Pyrene	Ultrasonic Extraction, Gas Chromatographic Method <sup>(9,16,17)</sup>
99	Selenium	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(23,24)</sup>
100	Silver	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>

101 Styrene...

ลำดับที่	สารเคมี	วิธีการตรวจ
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
102	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
103	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
105	Toxaphene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
106	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic Mass Spectrometric Method <sup>(14,22)</sup>
107	TPH (C <sub>8</sub> -C <sub>14</sub> )	Ultrasonic Extraction, Gas Chromatographic Mass Spectrometric Method <sup>(9,10,18)</sup>
108	TPH (C <sub>15</sub> -C <sub>35</sub> )	Ultrasonic Extraction, Gas Chromatographic Mass Spectrometric Method <sup>(10,18)</sup>
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
112	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
113	2,4,5-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
114	2,4,6-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
116	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>
117	Vinyl Acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>
118	Vinyl Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(14,22)</sup>

119 m-Xylene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
120	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
122	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
123	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(9,15)</sup>

## เอกสารอ้างอิง

1. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม พ.ศ.2549 เรื่อง กำหนดค่าปริมาณเคมีภัณฑ์ที่เจือปนในเอกภาคที่ระบายออกจากปล่องของหม้อน้ำโรงงานที่ใช้ถ่านหินเป็นเชื้อเพลิง. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125 4.
2. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม พ.ศ.2548 เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว. ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 114.
3. สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพมหานคร: เลื่อนแก้วการพิมพ์, 2547
4. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23<sup>rd</sup> ed. Washington, DC : APHA, 2017
5. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2017
6. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019
7. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2020
8. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments Sludges, and Soils. SW-846 Method 3050B, 1996.
9. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments, Sludges, and Soils. SW-846 Method 3051A, 2007
10. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.

11. United...

11. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. SW-846, 2006.
12. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Ultrasonic Extraction. SW-846 Method 3550C, 2007.
13. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. SW-846 Method 5035A, 2002
14. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap for Aqueous Samples. SW-846 Method 5035C, 2003.
15. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma – optical Emission Spectrometry. SW-846 Method 6010D, 2018
16. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Antimony and Arsenic (Atomic Absorption, Borohydride Reduction). SW-846 Method 7062A, 1994.
17. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric). Method 7196A, 1992.
18. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique). SW-846 Method 7471B, 2007.
19. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Nonhalogenated Organics Using GC/FID. SW-846 Method 8015D, 2003.
20. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organochlorine Pesticide by Gas Chromatography. SW-846 Method 8081B, 2007.
21. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Polychlorinated Biphenyls (PCBs) By Gas Chromatography. SW-846 Method 8082A, 2007
22. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8260D, 2018.

23. United...

23. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry. SW-846 Method 8270E, 2018.
24. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Microwave Extraction, Gas Chromatography/Mass Spectrometry. SW-846 Method 3546, 2007.
25. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide Extraction Procedure for Solids and Oils. SW-846 Method 9013A, 2014.



ที่ อก ๐๓๒๐/๖๖๕๒๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

ที่- ๗ สี.เค. ๒๕๖๕

เรื่อง เปลี่ยนแปลงชื่อสารมลพิษที่ได้รับขึ้นทะเบียนของห้องปฏิบัติการวิเคราะห์เอกชน  
เรียน กรรมการผู้จัดการ บริษัท เอสจีเอส (ประเทศไทย) จำกัด

อ้างถึง ๑. หนังสือบริษัท เอสจีเอส (ประเทศไทย) จำกัด ที่ SGS-ISE-๖๖/๐๐๕๑๗ ลงวันที่ ๒ สิงหาคม ๒๕๖๖  
๒. หนังสือกรมโรงงานอุตสาหกรรม ที่ อก ๐๓๒๐/๑๖๐๔๑ ลงวันที่ ๑ พฤศจิกายน ๒๕๖๕

ตามที่หนังสือที่อ้างถึง บริษัท เอสจีเอส (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๗ สถานที่ตั้งเลขที่ ๑/๒๐๔ หมู่ที่ ๑ ตำบลบ้านฉาง อำเภอบ้านฉาง จังหวัดระยอง ขอเปลี่ยนแปลงชื่อสารมลพิษที่ได้รับขึ้นทะเบียนของห้องปฏิบัติการวิเคราะห์เอกชน ความละเอียดแล้ว นั้น

กรมโรงงานอุตสาหกรรม อนุญาตให้เปลี่ยนชื่อสารมลพิษที่ได้รับขึ้นทะเบียนไว้วิเคราะห์  
ในน้ำได้ดิน ตามที่อ้างถึง ๒ รายการที่ ๔๐ เป็น DDT

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกชน คือในวันที่ ๑๒ ตุลาคม ๒๕๖๘ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ทันทีเว็บไซต์  
กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายทวี อำพาพันธ์)  
ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ einw@dw.mail.go.th

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กรมโรงงานอุตสาหกรรม โทร. ๐ ๓๓๑๓ ๖๐๕๔ ต่อ ๕๐๑-๒



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"







ที่ อก ๐๓๒๐/ ๕๒๓๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

## ๑๑ มิถุนายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอสจีเอส (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๑ มีนาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ บริษัท เอสจีเอส  
(ประเทศไทย) จำกัด จำนวน ๑๔ แผ่น

ตามคำขอฯ ที่อ้างถึง บริษัท เอสจีเอส (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน  
เลขทะเบียน ๖-๑๓๓๗ สถานที่ตั้งเลขที่ ๑/๒๐๕ และ ๑/๒๐๑ หมู่ที่ ๑ ตำบลบ้านกลาง อำเภอบ้านฉาง จังหวัดระยอง  
แจ้งขอเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษในน้ำเสีย น้ำใต้ดิน และสิ่งปฏิกูลหรือวัสดุที่ไม่ได้เสีย นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกขอข่ายรายการสารมลพิษในน้ำเสีย น้ำใต้ดิน และสิ่งปฏิกูลหรือวัสดุที่ไม่ได้เสีย  
ตามรายการเอกสารแนบท้ายหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชนที่ อก ๐๓๒๐/๑๖๐๔๑  
ลงวันที่ ๑ พฤศจิกายน ๒๕๖๕

๒. ให้วิเคราะห์สารมลพิษตามขอข่ายที่ได้รับขึ้นทะเบียนไว้วิเคราะห์ในน้ำเสีย จำนวน ๔๔ รายการ  
และน้ำใต้ดิน จำนวน ๑๐๓ รายการ และสิ่งปฏิกูลหรือวัสดุที่ไม่ได้เสีย จำนวน ๓๗ รายการ รวมทั้งสิ้นจำนวน  
๒๐๔ รายการ ตามเอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ ดังสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะมีผลย้อนหลังมาตั้งแต่วันที่ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกชนในวันที่ ๑๒ ตุลาคม ๒๕๖๕

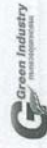
จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

๗

(นายพรยศ กลั่นกรอง)  
รองอธิบดี ปฏิบัติราชการแทน  
อธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๓๓ ๖๕๕ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ einw@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงเอกสารอ้างอิงวิธีวิเคราะห์สารมลพิษ  
บริษัท เอสจีเอส (ประเทศไทย) จำกัด เลขทะเบียน ๖-๑๓๓๗  
ที่ อก ๐๓๒๐/๕๒๓๕ ลงวันที่ ๑๑ มิถุนายน ๒๕๖๗

ขอข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๐๔ รายการ  
หน้าเสีย จำนวน ๔๔ รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
2	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
3	Barium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
5	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
6	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
7	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
8	Biochemical Oxygen Demand	5-Day BOD Test, Membrane Electrode Method <sup>[3]</sup>
9	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>[3]</sup>
11	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
12	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[3]</sup>
13	Copper	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
14	Cyanide	Distillation, Colorimetric Method <sup>[3]</sup>
15	p,p'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
16	p,p'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
17	o,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
18	p,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
19	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
20	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
21	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
22	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
23	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
24	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
25	Formaldehyde	Distillation, Colorimetric Method <sup>[2]</sup>
26	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
27	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
28	Hexavalent Chromium	Filtration, Colorimetric Method <sup>[3]</sup>
29	Lead	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
30	Manganese	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
31	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[3]</sup>
32	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[3]</sup>
33	Nickel	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
34	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>[3]</sup>
35	pH	Electrometric Method <sup>[3]</sup>
36	Phenols	Distillation, Direct Photometric Method <sup>[3]</sup>
37	Selenium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
38	Temperature	Field Method <sup>[3]</sup>
39	Total Chromium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
40	Total Dissolved Solids	Dried at 180 °C <sup>[3]</sup>
41	Total Kjeldahl Nitrogen	Digestion, Distillation, Titrimetric Method <sup>[3]</sup>
42	Total Suspended Solids	Dried at 103-105 °C <sup>[3]</sup>
43	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method, Calculation <sup>[3]</sup>
44	Zinc	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>

#### น้ำใต้ดิน จำนวน 123 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
2	Acetone	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>

4 Anthracene ...

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
6	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
9	Benzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
10	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[2]</sup>
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
18	Bis(2-Ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
19	Bromodichloromethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
20	Bromoform	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>

21 Butyl ...

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
40	DDT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
41	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
42	Di-n-Butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
43	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
44	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
45	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
46	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
47	1,1-Dichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
48	1,2-Dichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
49	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
50	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
51	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
52	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
21	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
22	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
23	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
24	Carbon disulfide	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
25	Carbon tetrachloride	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
26	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
27	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
28	Chlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
29	Chlorodibromomethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
30	Chloroform	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
31	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
32	Chromium	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
33	Chromium (III)	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method <sup>[3]</sup>
34	Chromium (VI)	Filtration, Colorimetric Method <sup>[3]</sup>
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
36	Cyanide	Distillation, Colorimetric Method <sup>[3]</sup>
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
53	1,2-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
54	1,3-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
55	1,3-Dichloropropene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
56	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
57	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
58	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
59	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
60	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
61	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
62	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
63	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
64	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
65	Ethylbenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
66	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
67	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
68	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
69	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
70	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
71	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
72	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
73	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
74	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
75	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
76	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
77	n-Hexane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
78	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
79	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
80	Lead	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
81	Manganese	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>
82	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[3]</sup>
83	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
84	Methyl Bromide	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
85	Methylene Chloride	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
86	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
87	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
88	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
89	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
90	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(3)</sup>
91	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
92	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
93	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
94	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
95	pH	Electrometric Method <sup>(3)</sup>
96	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
97	Phenol	Spectrometric Method <sup>(3)</sup>
98	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
99	Selenium	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
100	Silver	Digestion, Inductively Coupled Plasma Method <sup>(3)</sup>
101	Styrene	Digestion, Inductively Coupled Plasma Method <sup>(3)</sup> Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>

102 1,1,2,2-Tetrachloroethane ...

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
102	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
103	Tetrachloroethylene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
104	Toluene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
105	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
106	TPH (C <sub>5</sub> -C <sub>9</sub> )	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
107	TPH (C <sub>8</sub> -C <sub>14</sub> )	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
108	TPH (C <sub>5</sub> ,16-C <sub>33</sub> )	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
109	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
110	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
111	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
112	Trichloroethylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
113	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
114	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
115	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>
116	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(3)</sup>
117	Vinyl acetate	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>(3)</sup>

118 Vinyl chloride ...



ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
118	Vinyl chloride	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
119	m-Xylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
120	o-Xylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
121	p-Xylene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
122	Xylene (Total)	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[3]</sup>
123	Zinc	Digestion, Inductively Coupled Plasma Method <sup>[3]</sup>

## สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 37 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Alorin	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>

7 Chlordane ...

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
7	Chlordane	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
8	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction Colorimetric Method; Calculation <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8]</sup>
9	Chromium (VI)	1) Waste Extraction, Digestion, Colorimetric Method <sup>[9,10]</sup> 2) Alkaline Digestion, Colorimetric Method <sup>[9,10]</sup>
10	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
11	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
12	Dieldrin	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
13	DDO	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
14	DDE	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
15	DDT	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
16	2,4-D (2,4-Dichlorophenoxyacetic acid)	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
17	Endrin	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
18	Heptachlor	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
19	Kepon	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,8]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,8]</sup>
21	Lindane	Ultrasonic Extraction, Gas Chromatographic Method <sup>[4,5,6]</sup>

22 Mercury ...

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1,11)</sup> 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1,11)</sup> Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup> Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup> Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
23	Methoxychlor	Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
24	Mirex	Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup> Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
26	Polychlorinated Biphenyls (PCBs)	Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
27	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic Method <sup>(6,5,6)</sup>
28	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
29	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
31	Silver; 2,4,5-Trichlorophenoxypropionic acid	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>

ลำดับ ที่	สารเคมี	วิธีวิเคราะห์
33	Total Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction Colorimetric Method; Calculation <sup>(1,9,10)</sup> 2) Digestion, Inductively Coupled Plasma-Atomic Emission Spectrometry Method Method <sup>(7,8)</sup> Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(12,13)</sup>
34	Toxaphene	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
35	Trichloroethylene	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
36	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>
37	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,8)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,8)</sup>

## เอกสารอ้างอิง

1. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2566. เรื่อง การจัดการสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว.ราชกิจจานุเบกษา. 31 พฤษภาคม 2566. เล่มที่ 140 ตอนพิเศษ 126 ง.
2. สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547
3. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24<sup>th</sup> ed. Washington, DC: APHA, 2023.
4. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Ultrasonic Extraction. SW-846 Method 3550C, 2007
5. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organochlorine Pesticide by Gas Chromatography. SW-846 Method 8081B, 2007.
6. United States Environment Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Polychlorinated Biphenyls (PCBs) By Gas Chromatography. SW-846 Method 8082A, 2007

7. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments Sludges, and Soils. SW-846 Method 3050B, 1996.
8. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma – optical Emission Spectrometry. SW-846 Method 6010D, 2018
9. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.
10. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric). Method 7196A, 1992.
11. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique). SW-846 Method 7471B, 2007.
12. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap for Aqueous Samples. SW-846 Method 5035C, 2003.
13. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS). SW-846 Method 8260D, 2018.

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กรมโรงงานอุตสาหกรรม โทร. ๐ ๓๓๑๑๑๑๑ ต่อ ๕๐๐๑-๒



ที่ อก ๐๒๖๐/ ๑๗๔๑๓

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๗ มิ.ย. ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์  
เรียน กรรมการผู้จัดการ บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาของ)  
อ้างถึง คำขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ ธันวาคม ๒๕๖๖

ตามหนังสืออ้างอิง บริษัท เอสจีเอส (ประเทศไทย) จำกัด (สาขาของ) ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ๖-๑๔๗ สถานที่ตั้งเลขที่ ๑/๒๐๔ และ ๑/๒๐๕ หมู่ที่ ๑ ตำบลบ้านด่าง  
อำเภอบ้านด่าง จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้อยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์  
จำนวน ๓ ราย ได้แก่

๑. นายฟ้าลั่น ศรีท่าบุญ
๒. นายปฏินันท์ ทิพย์ชิต
๓. นายปริศนา พงษ์วิชัย

ทะเบียนเลขที่ ๖-๑๔๗-จ-๐๐๑๖  
ทะเบียนเลขที่ ๖-๑๔๗-จ-๐๐๑๑  
ทะเบียนเลขที่ ๖-๑๔๗-จ-๐๐๑๓

ทั้งนี้ หากท่านมีความประสงค์จะยื่นคำขอใด ๆ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์  
ได้ทันทีเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทวี อำพันนธ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
ปฏิบัติการราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๑๑๑๑ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ eirw@dlw.mail.go.th







ที่ อก ๐๓๒๐/ ๑๗/๕๖๓

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๗ มิ.ย. ๒๕๖๖

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์  
เรียน กรรมการผู้จัดการ บริษัท เอสซีเอส (ประเทศไทย) จำกัด (สาขาของ)  
อ้างถึง คำขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๔ ธันวาคม ๒๕๖๖

ตามหนังสือที่ยังถึง บริษัท เอสซีเอส (ประเทศไทย) จำกัด (สาขาของ) ห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ๖-๑๕๗ สถานที่ตั้งเลขที่ ๑/๒๐๙ และ ๑/๒๑๑ หมู่ที่ ๑ ตำบลบ้านฉาง  
อำเภอบ้านฉาง จังหวัดระยอง ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์  
จำนวน ๑ ราย ได้แก่ นายจิรเทพ มีเงิน ทะเบียนเลขที่ ๖-๑๕๗-๖-๐๐๓๓ ทั้งนี้ หากท่านมีความประสงค์จะยื่น  
คำขอใด ๆ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ทั้งนี้ เว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายทวี อำพันนธ์)

ผู้อำนวยการศูนย์วิจัยและพัฒนายัมพลพิงโรงงานภาคตะวันออก  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนายัมพลพิงโรงงานภาคตะวันออก  
โทร. ๐ ๓๓๑๓๓ ๖๐๕๔ ต่อ ๕๐๐๑-๒  
ไปรษณีย์อิเล็กทรอนิกส์ einw@dw.mail.go.th





ภาคผนวกที่ 3

เอกสารสอบเทียบอุปกรณ์เครื่องมือตรวจวัดคุณภาพสิ่งแวดล้อม

## Meter Console Verification

Dry Gas Meter ID. : ENSS 16113 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : SY

## Wet gas meter Information

Wet gas Brand : Shinagawa Wet gas S/N : 544122  
Wet gas Model : W-NK-2.5A Expire Date : 10-Jun-2027

Orifice Setting ΔH@ (mm H <sub>2</sub> O)	Wet gas		Metering System		Time (min)	YI	ΔH@	
	V <sub>w</sub> (L)	T <sub>w</sub> (°C)	V <sub>d</sub> (L)	T <sub>m</sub> (°C)				
13	138.72	25.2	140.0	24.0	12.19	0.9856	48.762	
13	138.06	25.0	140.0	24.0	12.22	0.9816	49.564	
26	138.64	24.8	140.0	24.5	8.36	0.9870	47.439	
26	137.28	24.5	140.0	25.0	8.38	0.9797	48.221	
40	273.76	24.3	280.0	25.0	14.08	0.9764	50.367	
40	272.64	24.1	280.0	25.0	14.04	0.9730	50.236	
50	270.74	23.9	280.0	25.5	12.31	0.9674	50.333	
50	271.20	23.8	280.0	26.0	12.32	0.9710	50.178	
70	273.46	23.7	280.0	26.0	10.29	0.9776	48.400	
70	271.60	23.6	280.0	26.0	10.27	0.9712	48.721	
90	268.50	23.6	280.0	26.0	9.11	0.9583	49.595	
90	268.50	23.6	280.0	26.0	9.13	0.9583	49.955	
Average							0.9739	49.314

Remark :  
 $YI \leq \pm 0.02$  from average  
 $YI = 1.00 \pm 0.05$   
 $\Delta H@ \leq \pm 5.08$  mm H<sub>2</sub>O from average  
 $\Delta H@ = 46.7 \pm 6.4$  mm H<sub>2</sub>O

Checked By : Chaowalit S. Approved By : Thapson Y.  
(Chaowalit Srinan) (Thapson Yommana)  
Position : Senior Inspector Position : Technical Specialist Manager  
Date : 14/8/2025 Date : 14/08/2025

## Temperature Display Verification

Dry Gas Meter ID. : ENSS 16113 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : PK

## Temperature Simulator Information

Simulator Brand : Handy Cal Simulator S/N : T1L1015  
Simulator Model : CA11E Expire Date : 24-Jul-2026

Standard Value	Instrument Display				
	Stack	Probe	Filter	Aux	Exit
300	300	300	300	300	-
200	200	200	200	200	-
150	151	151	151	151	-
100	101	101	101	101	-
50	51	50	50	51	51
0	0	0	0	0	0
Difference	0.3%	1.0	1.0	1.0	1.0

Remark :  
Stack  $\leq \pm 1.5$  % Absolute  
Probe  $\leq \pm 3.0$  °C  
Filter  $\leq \pm 3.0$  °C

Aux  $\leq \pm 3.0$  °C  
Exit  $\leq \pm 3.0$  °C

Checked By : Chaowalit S. Approved By : Thapson Y.  
(Chaowalit Srinan) (Thapson Yommana)  
Position : Senior Inspector Position : Technical Specialist Manager  
Date : 14/8/2025 Date : 14/08/2025

## Meter Console Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : SY

## Wet gas meter Information

Wet gas Brand : Shinagawa Wet gas S/N : 544122  
Wet gas Model : W-NK-2.5A Expire Date : 10-Jun-2027

Orifice Setting $\Delta H@$ (mm H <sub>2</sub> O)	Wet gas		Metering System		Time (min)	YI	$\Delta H@$
	V <sub>w</sub> (L)	T <sub>w</sub> (°C)	V <sub>d</sub> (L)	T <sub>m</sub> (°C)			
13	138.58	24.2	140.0	20.0	12.41	0.9748	52.359
13	137.78	24.0	140.0	20.5	12.39	0.9713	52.548
26	137.62	24.1	140.0	21.0	8.55	0.9704	52.334
26	137.56	24.1	140.0	21.5	8.55	0.9717	52.290
40	274.78	23.9	280.0	22.0	13.56	0.9713	49.163
40	273.70	23.7	280.0	22.5	13.54	0.9698	49.166
50	273.08	23.6	280.0	23.0	12.19	0.9687	48.389
50	272.54	23.6	280.0	23.0	12.19	0.9688	48.581
70	271.62	23.6	280.0	23.0	10.17	0.9615	47.841
70	270.80	23.6	280.0	23.5	10.17	0.9604	48.034
90	268.72	23.6	280.0	24.0	9.03	0.9528	48.588
90	267.78	23.6	280.0	25.0	9.02	0.9527	48.586
Average							0.9660 49.823

Remark :  
 $YI \leq \pm 0.02$  from average  
 $YI = 1.00 \pm 0.05$   
 $\Delta H@ \leq \pm 5.08$  mm.H<sub>2</sub>O from average  
 $\Delta H@ = 46.7 \pm 6.4$  mm.H<sub>2</sub>O

Checked By : Chawalit S. (Chaowalit Srinan)  
Position : Senior Inspector  
Date : 14/8/2025

Approved By : Thepsan Y. (Thepsan Yommana)  
Position : Technical Specialist Manager  
Date : 14/08/2025

## Temperature Display Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : PK

## Temperature Simulator Information

Simulator Brand : Handy Cal Simulator S/N : T1L1015  
Simulator Model : CA11E Expire Date : 24-Jul-2026

Standard Value	Instrument Display			
	Stack	Probe	Filter	Aux
300	301	301	301	301
200	201	201	201	201
150	152	152	152	152
100	102	101	101	102
50	50	50	50	51
0	0	0	0	0
Difference	0.5%	2.0	2.0	2.0

Remark :  
Stack  $\leq \pm 1.5$  % Absolute  
Probe  $\leq \pm 3.0$  °C  
Filter  $\leq \pm 3.0$  °C

Aux  $\leq \pm 3.0$  °C  
Exit  $\leq \pm 3.0$  °C

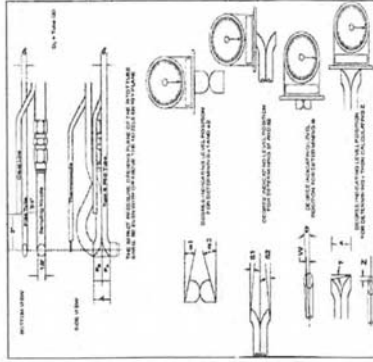
Checked By : Chawalit S. (Chaowalit Srinan)  
Position : Senior Inspector  
Date : 14/8/2025

Approved By : Thepsan Y. (Thepsan Yommana)  
Position : Technical Specialist Manager  
Date : 14/08/2025

## Certificate of Calibration

S-Type Geometric Pitot Tube Calibration

See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.



Pitot tube/Probe No. No. 59/A10404

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or Y	PASS
Ports Damaged?	N	No or n	PASS
$\alpha 1$	1.1	$-10^\circ < \alpha 1 < +10^\circ$	PASS
$\alpha 2$	-2.1	$-10^\circ < \alpha 1 < +10^\circ$	PASS
$\beta 1$	-1.2	$-5^\circ < \alpha 1 < +5^\circ$	PASS
$\beta 2$	-1.5	$-5^\circ < \alpha 1 < +5^\circ$	PASS
$\gamma$	-1.6	N/A	-
$\theta$	-1.9	N/A	-
$D_t$	0.375	$0.188''$ to $0.375''$	PASS
A	0.966142	$2.1D_t \leq A \leq 3.0D_t$	PASS
A/2D <sub>t</sub>	1.288189	$1.05 \leq P_d/D_t \leq 1.5$	PASS
Z = A tan $\gamma$	-0.02699	$Z \leq 0.125''$	PASS
W = A tan $\theta$	-0.03205	$W \leq 0.031''$	PASS

I certify that pitot tube/probe No. 59/A10404 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.84. See 40 CFR Pt. 60, App A, EPA Method 2

Standard Device  
Device Name Digital Inclinator  
Manufacturer BASELINE  
Model 12-1057  
ID No. QC-1824

Expiration date  
ENSS No. 12-Dec-25  
ENSS 22159

Certified by Neenden A.  
Date 4/10/1825

Approved by  
Date 4/11/25

## Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENSS 043  
Nozzle ID ENSS 091 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo		D <sub>avg</sub>
	D1	D2	D3	AD		
1	3.12	3.16	3.10	0.06		3.13
2	4.42	4.42	4.42	0.00		4.42
3	5.12	5.12	5.10	0.02		5.11
4	6.20	6.20	6.22	0.02		6.21
5	9.02	9.10	9.10	0.08		9.07
6	9.30	9.36	9.30	0.06		9.33
7	12.52	12.58	12.50	0.08		12.53

Remark:  $\Delta D$  = Maximum distance between any two diameters, must be  $\leq 0.100$  mm  
 $D_{avg} = (D1+D2+D3)/3$

Checked By: Chawalit G.  
Position: Supervisor  
Date: 4/10/25

Approved By: [Signature]  
Position: CEMs Manager  
Date: 4/11/25





Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENSS 043  
Nozzle ID ENSS 16112 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo		D <sub>avg</sub>
	D1	D2	D3	AD		
1	2.96	2.94	3.00	0.06		2.97
2	4.30	4.32	4.38	0.08		4.33
3	4.80	4.82	4.80	0.02		4.81
4	7.52	7.60	7.58	0.08		7.57
5	9.02	9.00	9.00	0.02		9.01
6	10.76	10.72	10.74	0.04		10.74
7	12.62	12.58	12.50	0.12		12.57

Remark :  $\Delta D$  = Maximum distance between any two diameters, must be  $\leq 0.100$  mm  
 $D_{avg} = (D1+D2+D3)/3$

Checked By : Chawalit S. Approved By : Phatsakorn soonthornwiphat  
(Chawalit Srinan) (Phatsakorn soonthornwiphat)  
Supervisor CEMs Manager  
Date : 4/01/25 Date : 4/1/25



Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENSS 043  
Nozzle ID ENSS 16111 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo		D <sub>avg</sub>
	D1	D2	D3	AD		
1	3.10	3.10	3.08	0.02		3.09
2	4.48	4.48	4.48	0.00		4.48
3	5.64	5.70	5.64	0.06		5.66
4	6.12	6.10	6.08	0.04		6.10
5	9.16	9.20	9.20	0.04		9.19
6	10.86	10.80	10.80	0.06		10.82
7	12.50	12.52	12.48	0.04		12.50

Remark :  $\Delta D$  = Maximum distance between any two diameters, must be  $\leq 0.100$  mm  
 $D_{avg} = (D1+D2+D3)/3$

Checked By : Chawalit S. Approved By : Phatsakorn soonthornwiphat  
(Chawalit Srinan) (Phatsakorn soonthornwiphat)  
Supervisor CEMs Manager  
Date : 4/01/25 Date : 4/1/25



## Certificate of Calibration

**Equipment:** Balance  
**Model:** CPA225D  
**Serial No. (or ID.):** 28812504 (B2014002)  
**Manufacturer:** Sartorius  
**Condition:** In condition

**Customer:** SGS (THAILAND) CO., LTD.  
1/209, 1/211 Moo 1, Tambol Banchang,  
Amphur Banchang, Rayong 21130 Thailand

**Environment Condition:** Temperature 21 °C ± 0.9 °C  
Humidity 72 %RH ± 1.6 %RH

**Calibration Place:** SGS (THAILAND) CO., LTD. ( Balance Lab )  
1/209, 1/211 Moo 1, Tambol Banchang,  
Amphur Banchang, Rayong 21130 Thailand

**Calibration By:** Mr. Thanathom Phunook  
**Calibration Date:** 07 November 2024  
**The Method used:** In-house method, CAL-WI-47, based on UKAS Lab 14  
**Traceability:** This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02240400

(Mr. Thanathom Phunook)

Person in charge

(Mr. Adisai Maknoi)

Authorized signatory

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

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Prachinburi 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/certificate-thailand

Delivering Growth - In Asia and Beyond.

CAL-FM-C01-14: 12 Sep 2022



Certificate No.: C01243462

Page: 2 of 5

### Calibration Results:

#### Before Adjustment

**Eccentric Error:** Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.

Nominal Test Value	Reference Points (g)				
	A	B	C	D	E
-	0.0000	-0.0001	-0.0003	0.0000	0.0000

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.00001 (g)

Nominal test value (g)	Standard Deviation
5	0.000005
50	0.000005

**Error of indication from nominal or conventional mass value.,** Readability 0.00001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
0.01	0.010001	0.01001	0.00001	0.000011	2.03
0.05	0.049998	0.05001	0.00001	0.000012	2.02
0.1	0.100003	0.10002	0.00002	0.000013	2.01
0.5	0.500003	0.50000	0.00000	0.000016	2.01
1	1.000014	1.00001	0.00000	0.000018	2.00
5	5.000016	5.00003	0.00001	0.000027	2.00
10	10.000013	10.00005	0.00004	0.000034	2.00
20	20.000011	20.00006	0.00005	0.000048	2.00
50	50.000028	50.00008	0.00005	0.000080	2.00
70	70.000039	70.00012	0.00008	0.00013	2.00
90	90.000048	90.00013	0.00008	0.00016	2.00

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Prachinburi 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/certificate-thailand

Delivering Growth - In Asia and Beyond.

CAL-FM-C01-14: 12 Sep 2022



Certificate No.: C01243462

Page: 3 of 5



Certificate No.: C01243462

Page: 4 of 5

### Before Adjustment (Cont.)

Repeatability: Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
110	0.00005
200	0.00005

Error of Indication from nominal or conventional mass value., Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
105	104.99998	105.0002	0.0002	0.00019	2.00
110	109.99997	110.0002	0.0002	0.00019	2.00
120	119.99997	120.0003	0.0003	0.00021	2.00
130	129.99998	130.0003	0.0003	0.00023	2.00
140	139.99998	140.0003	0.0003	0.00024	2.00
150	149.99999	150.0004	0.0004	0.00023	2.00
160	160.00000	160.0004	0.0004	0.00027	2.00
170	170.00000	170.0002	0.0002	0.00027	2.00
180	180.00001	180.0002	0.0002	0.00030	2.00
190	190.00001	190.0002	0.0002	0.00031	2.00
200	199.99996	200.0003	0.0003	0.00029	2.00

### After Adjustment

Eccentric Error: Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.

Nominal Test Value (g)	Reference Points (g)				
	A	B	C	D	E
-	-	0.0000	-0.0001	-0.0003	0.0000

Repeatability: Determination of the standard deviation of weighing balance., Readability 0.00001 (g)

Nominal test value (g)	Standard Deviation
5	0.000005
50	0.000005

Error of Indication from nominal or conventional mass value., Readability 0.00001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
0.01	0.010001	0.01000	0.00000	0.000011	2.03
0.05	0.049998	0.05000	0.00000	0.000012	2.02
0.1	0.100003	0.09998	-0.00002	0.000013	2.01
0.5	0.500003	0.49998	-0.00002	0.000016	2.01
1	1.000014	1.00001	0.00000	0.000018	2.00
5	5.000016	5.00001	-0.00001	0.000027	2.00
10	10.000013	10.00000	-0.00001	0.000034	2.00
20	20.000011	20.00001	0.00000	0.000048	2.00
50	50.000028	50.00002	-0.00001	0.000080	2.00
70	70.000039	70.00003	-0.00001	0.00013	2.00
90	90.000048	90.00003	-0.00002	0.00016	2.00



Certificate No.: C01243462

Page: 5 of 5

#### After Adjustment (Cont.)

Repeatability: Determination of the standard deviation of weighing balance., Readability

0.0001 (g)

Nominal test value (g)	Standard Deviation
110	0.00005
200	0.00004

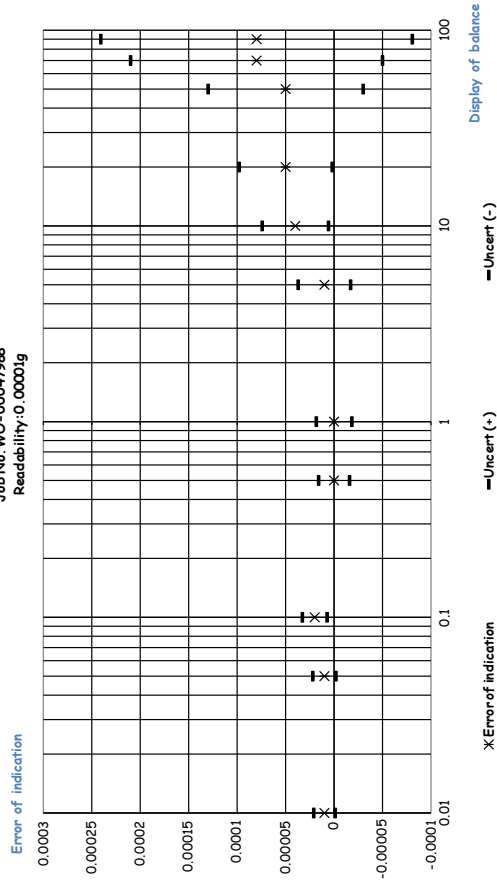
Error of Indication from nominal or conventional mass value., Readability

0.0001 (g)

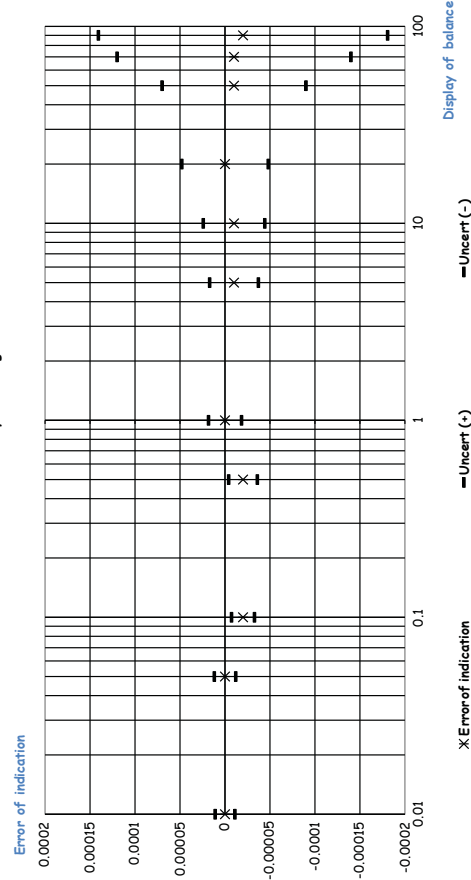
Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
105	104.99998	105.0000	0.0000	0.00019	2.00
110	109.99997	110.0000	0.0000	0.00019	2.00
120	119.99997	120.0000	0.0000	0.00021	2.00
130	129.99998	130.0000	0.0000	0.00023	2.00
140	139.99998	140.0000	0.0000	0.00024	2.00
150	149.99999	150.0000	0.0000	0.00023	2.00
160	160.00000	160.0000	0.0000	0.00027	2.00
170	170.00000	170.0000	0.0000	0.00027	2.00
180	180.00001	180.0000	0.0000	0.00030	2.00
190	190.00001	190.0000	0.0000	0.00031	2.00
200	199.99996	200.0000	0.0000	0.00029	2.00

The End of Certificate

Before Adjustment  
Job No. WO-00047988  
Readability: 0.00001g



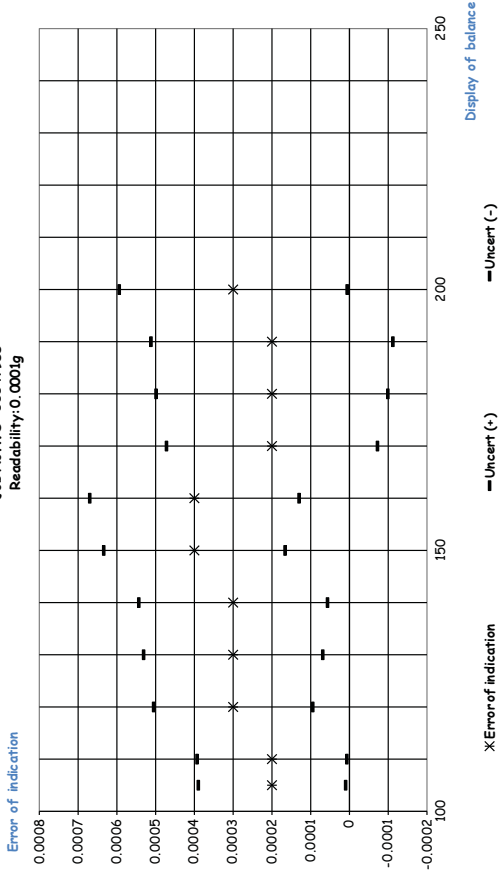
After Adjust  
Job No. WO-00047988  
Readability: 0.00001g



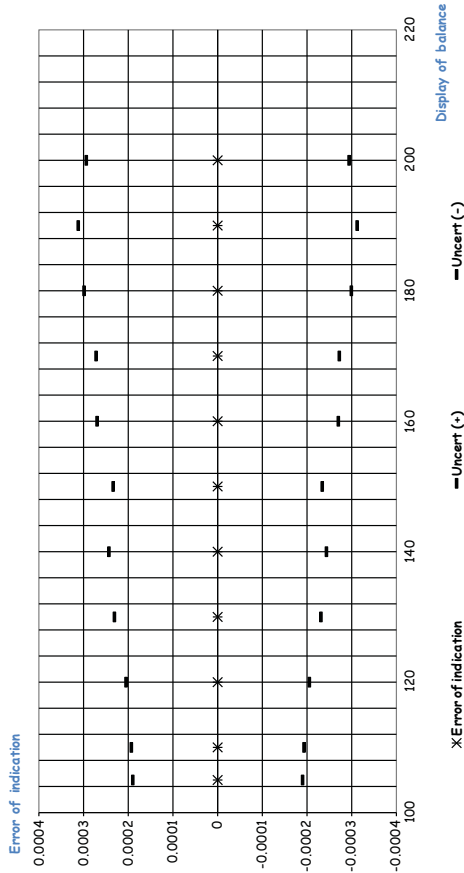




Before Adjustment  
Job No. WO-00047988  
Readability: 0.0001g



-



## ใบตรวจสอบสภาพเครื่องชั่ง

ชนิดเครื่องมือ: Balance      รุ่น: CPA225D      เลขที่ใบงาน: WO-00047988  
หมายเลขเครื่อง: 28812504

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
07 Nov 2024			07 Nov 2024		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. สายไฟ/Adapter, power supply 220/110V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสมบูรณ์ชุดกระงกกันลม (Cover)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. ความสมบูรณ์ชุดของระดับน้ำ	<input type="checkbox"/>	<input checked="" type="checkbox"/>	เสื่อมสภาพ
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. การปรับระดับของชั่งต้นเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. การตอบสนองของปุ่มกด	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. ความสมบูรณ์ของ Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. การแสดงผลของ Display หลังวางน้ำหนัก	<input type="checkbox"/>	<input checked="" type="checkbox"/>	**
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. ชุดรองงานชั่ง (Stopper) / pan support	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. การทำงานของ Function Internal / External	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. ความสะอาดของตัวเครื่องภายนอกและแกน load cell	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. สภาวะแวดล้อม ณ สถานที่ตั้งเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

หมายเหตุเพิ่มเติม/ข้อแนะนำ :

\*\* การแสดงผลของ Display หลังวางน้ำหนัก : มีค่าน้ำหนักติดไปถึงตำแหน่งที่ 3 แล้วค่าน้ำหนักถึงจะค่อยๆลดลง ไปค่าที่ใกล้เคียงกับค่าน้ำหนักที่ใช้งาน Test

Mr. Thanathorn Phunook  
Service Engineer



# Thermology Co., Ltd.

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue Mar 26, 2025 Cert No. 25/1243  
Order No. 25030172

Customer SGS (Thailand) Limited.

1/209, 1/211 Moo 1, T. Ban Chang, A. Ban Chang Rayong 21130 Thailand.

Place of Calibration Hot Lab

Description

Model UFE400

Serial No. G410.0833

ID.No. O2010002

Date of Receipt Mar 24, 2025

Date of Calibration Mar 24, 2025

Environment

Temperature (Min) 28.4 °C (Max) 29.6 °C

Relative Humidity (Min) 37.3 %rh (Max) 44.9 %rh

Calibration Method

WI-17: The reference thermometer was placed into the chamber and measurement was performed based on AS-2853.  
The temperature scale in use at this laboratory is the International Temperature Scale of 1990.

Standard Equipment

1) Data Acquisition Switch Unit with Sensor

This certificate is traceable to SI unit.

Serial No.

MY59003190

Certificate No.

QR24-1215

Due Date

07 Jun 2025

Page 1 of 5

This certificate is issued in accordance with the conditions of accreditation granted by Thermology Laboratory Room. The traceability to recognised national standard and the unit of measurement realised at corresponding national standard Laboratory Room. This certificate may not be reproduced other than in full except with the prior written approval of Laboratory Room.



# Thermology Co., Ltd.

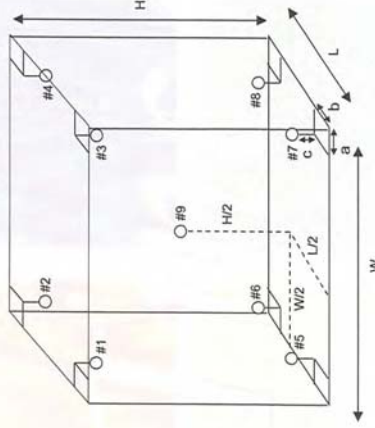
96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue Mar 26, 2025 Cert No. 25/1243  
Order No. 25030172

Results (without adjustment)



Position of reference thermometers were placed

Note:

- 1). Dimension ( $W \times L \times H$ ) is  $40 \times 33 \times 40$  cm
- 2). Stability - greatest one half of difference between max peak and min peak of each reference probe measured temperature obtained during the calibration interval.
- 3). 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. The reference sensor should preferably be located at the geometric center of the chamber.

Page 2 of 5



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue

Mar 26, 2025

Cert No. 25/1243

Order No. 25030172

Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability ±(°C)	Uniformity (°C)	Uncertainty ±(°C)
85.0	85.0	85.0	Position 1	85.191	0.050	0.31
			Position 2	85.077		
			Position 3	84.608		
			Position 4	84.979		
			Position 5	85.009		
			Position 6	85.183		
			Position 7	84.615		
			Position 8	84.798		
			Position 9	84.871		

Page 3 of 5

Handwritten signature



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue

Mar 26, 2025

Cert No. 25/1243

Order No. 25030172

Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability ±(°C)	Uniformity (°C)	Uncertainty ±(°C)
150.0	150.0	150.0	Position 1	150.554	0.124	0.47
			Position 2	150.313		
			Position 3	149.593		
			Position 4	150.020		
			Position 5	150.151		
			Position 6	150.616		
			Position 7	149.207		
			Position 8	149.770		
			Position 9	149.864		

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability ±(°C)	Uniformity (°C)	Uncertainty ±(°C)
180.0	180.0	180.0	Position 1	180.745	0.073	0.48
			Position 2	180.419		
			Position 3	179.498		
			Position 4	180.001		
			Position 5	180.213		
			Position 6	180.826		
			Position 7	179.040		
			Position 8	179.784		
			Position 9	179.847		

Page 4 of 5

Handwritten signature



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue Mar 26, 2025 Cert No. 25/1243  
Order No. 25030172

The stability and uniformity were taken into account in the measurement uncertainty stated.  
The above results are valid exclusively for calibration samples as mentioned in this report.  
This reported expanded uncertainty was based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with ONAC requirements.

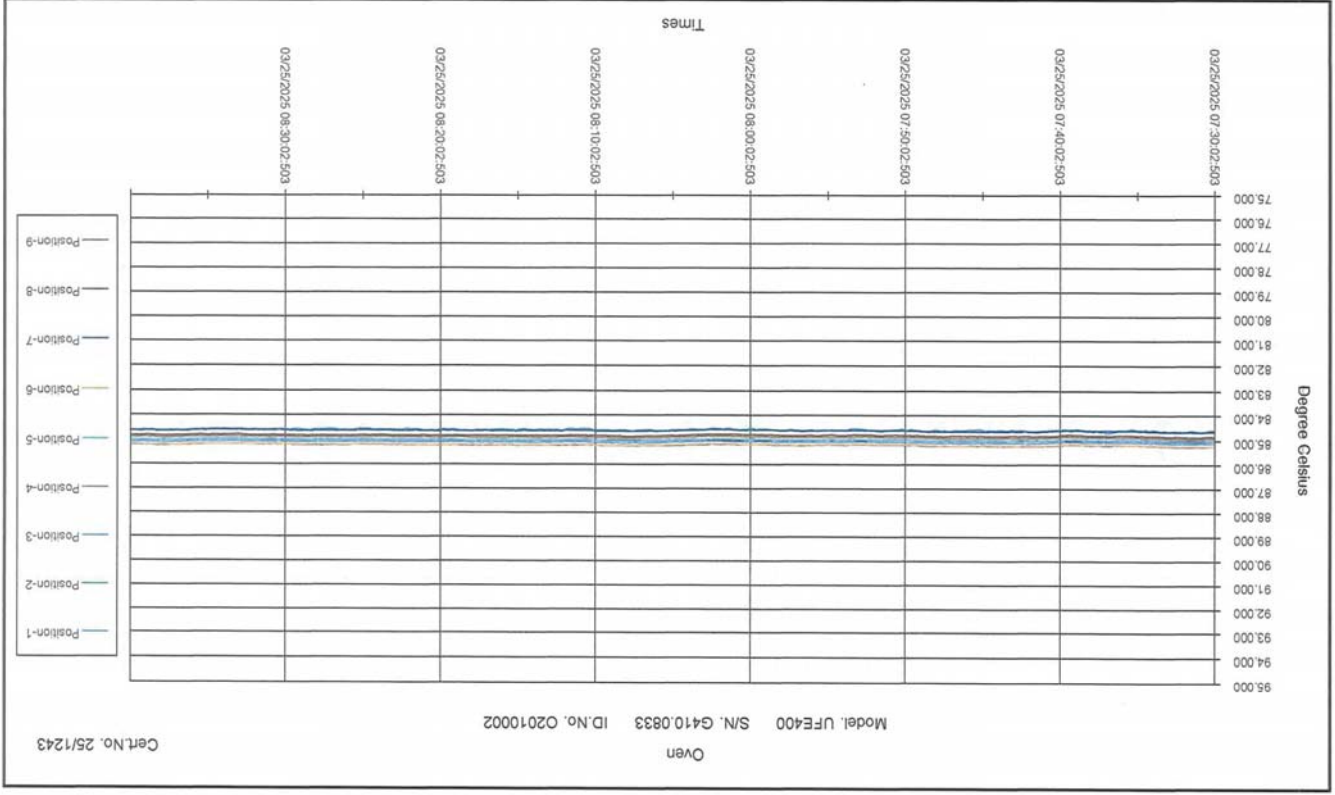
APPROVED SIGNATORY :

[ ] MR. PRAJUCKPETCH THONGSOOKCHOTE

[ ] MR. DAMRONG Mulsing

[ ] MR. JATURAPAT THONGSOOKCHOTE

Page 5 of 5







**PETRO-INSTRUMENTS CORP., LTD.**

7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines), 513 2333 (12 Lines), 513 9575-9 FAX: (662) 513 3730, 939 4208  
http://www.pico.co.th E-mail-address: [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

# Calibration Report

# 1Single-Point Gas Test Report

<b>Equipment:</b>	All Gas Analyzer	<b>Customer Name:</b>	SGS (Thailand) Limited
<b>Manufacturer:</b>	ABB, Thermo Electron	<b>Contact Name:</b>	Khun Phatsakorn Soonthornwiphat

### Standard gas Information

Cylinder Number : ND27163

Sulfur Dioxide (SO<sub>2</sub>) = 90.82 ppm

Cylinder Number : ND27163  
Expiration Date: Jan 25, 2030

<p> <b>Cylinder Number:</b> 11247103  <b>Carbon Monoxide (CO) =</b> 89.58 ppm  <b>Balance Nitrogen</b> </p>	<p> <b>Expiration Date:</b> Jan 29, 2020                 </p>
---	---

Cylinder Number : ND27163  
Expiration Date: Jan 25, 2030

Cylinder Number : ND27163  
Expiration Date: Jan 23, 2030  
Balance Nitrogen  
Nitrogen Oxide (NO) = 91.06 ppm

Nitrogen Oxide (NO) = 51.00 ppm  
 Expiration Date: Feb 14 2027  
 Cylinder Number: GN0018520  
 Balance Nitrogen

Cylinder Number : GN0018529

Carbon Dioxide (CO<sub>2</sub>) = 20.95 %  
Balance Nitrogen  
Examination Date: May 27, 2024  
Certificate Number: 4604065V

**Cylinder Number : 4621265Y**  
**Expiration Date: Nov 27, 2031**

## VALIDATION RESULT TABLE

Parameter	ZERO		SPAN		Resultant Conclusion
	Ideal	Actual	Ideal	%Error	
NO	0.00	0.639	91.06	118.00	29.58
NO <sub>x</sub>	0.00	0.662	91.26	119.00	30.40
SO <sub>2</sub>	0.00	1.5	90.82	104.00	14.51
CO	0.00	2.650	89.58	79.20	-11.59
CO <sub>2</sub>	0.00	-0.088	20.95	18.35	-12.41
O <sub>2</sub>	0.00	-0.04	20.90	21.00	0.10

## CALIBRATION RESULT TABLE

Parameter	ZERO		SPAN		Resultant Conclusion
	Ideal	Actual	Ideal	Actual	
NO	0.00	0.001	91.06	91.10	Passed
NO <sub>X</sub>	0.00	0.001	91.26	91.30	Passed
SO <sub>2</sub>	0.00	0.000	90.82	90.82	Passed
CO	0.00	0.001	89.58	89.60	Passed
CO <sub>2</sub>	0.00	0.001	20.95	20.95	Passed
O <sub>2</sub>	0.00	0.00	20.90	20.90	Passed

Remark: Percent Error of each Parameter must be less than  $\pm 5\%$  of reading.

Note:	Perform calibration to all analyzer and the result is in the control limits
-------	---

**DONE BY: Mr. Phuwanai Nakakul**

DATE: 7-16 January 2025

## CALIBRATION REPORT

PAGE 1 OF 10

PM-SGS CEMs MOBILE#03-2025



บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chauchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	NO-NO <sub>2</sub> -NO <sub>x</sub> Analyzer (NO <sub>x</sub> )	Manufacturer :	Thermo Fisher Scientific
Model :	42iHL-BZSSDCA	Serial Number:	1152640007

#### Standard gas Information

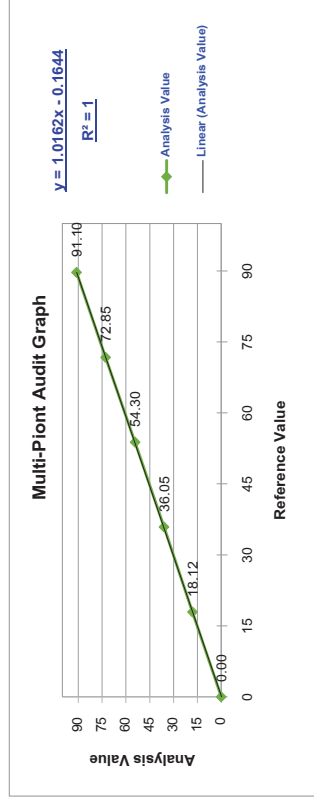
Cylinder Number : ND27163  
Nitric Oxide (NO<sub>x</sub>) = 91.26 ppm  
Balance Nitrogen

Zero air used Nitrogen 99.999%

#### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
Level	ppm	#1	#2			
#1	Zero	0.00	0.01	0.00	0.00	0.00
#2	20%	17.94	18.20	18.12	0.18	1.00
#3	40%	35.87	36.10	36.00	0.18	0.50
#4	60%	53.81	54.20	54.00	0.49	0.91
#5	80%	71.74	72.90	72.85	1.11	1.54
#6	100%	89.68	91.10	91.10	1.42	1.58
Measuring Range		100	ppm	Average Difference (%)		0.92

Correlation Coefficient	1.0000	Slope	1.0162	Intercept	-0.1644
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuvanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 2 OF 10

PM-SGS CEMS NOBLE#03-2025



บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	NO-NO <sub>2</sub> -NO <sub>x</sub> Analyzer (NO)	Manufacturer :	Thermo Fisher Scientific
Model :	42iHL-BZSSDCA	Serial Number:	1152640007

#### Standard gas Information

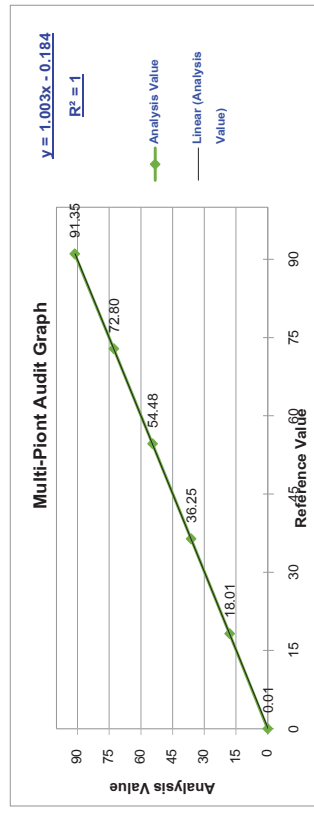
Cylinder Number : ND27163  
Nitric Oxide (NO) = 91.06 ppm  
Balance Nitrogen

Zero air used Nitrogen 99.999%

#### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
Level	ppm	#1	#2			
#1	Zero	0.00	0.01	0.01	0.01	0.01
#2	20%	18.21	18.02	18.00	-0.20	-1.11
#3	40%	36.42	36.20	36.30	-0.17	-0.48
#4	60%	54.64	54.60	54.35	-0.16	-0.29
#5	80%	72.85	73.20	72.40	-0.05	-0.07
#6	100%	91.06	91.30	91.35	0.29	0.32
Measuring Range		100	ppm	Average Difference (%)		0.38

Correlation Coefficient	1.0000	Slope	1.0030	Intercept	-0.1840
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuvanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 3 OF 10

PM-SGS CEMS NOBLE#03-2025



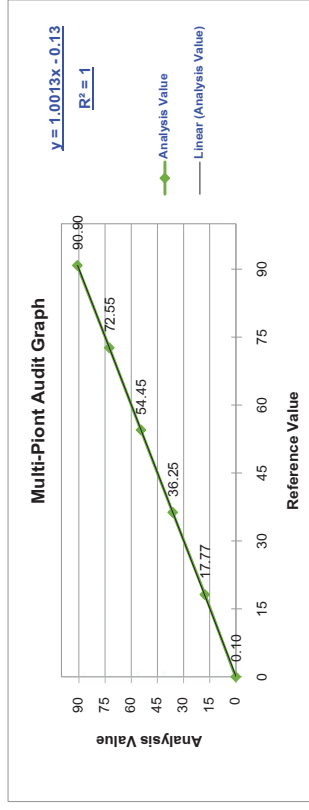
บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

Multi-Point Gas Test Report			
Equipment :	SO <sub>2</sub> Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	43iHL-DZCA	Serial Number:	12403232473
<b>Standard gas Information</b>			
Cylinder Number : ND27163			
Sulfur Dioxide (SO <sub>2</sub> ) = 90.82 ppm			
Balance Nitrogen			
Zero air used Nitrogen 99.99%			

Multi-Point Gas Test Data						
Reference gas value		Analyzer Display Value			Error (ppm)	% Error
		#1	#2	Avg.		
Level	ppm					
#1	Zero	0.00	0.1	0.10	0.10	0.10
#2	20%	18.16	17.8	17.7	-0.39	-2.17
#3	40%	36.33	36.3	36.25	-0.08	-0.21
#4	60%	54.49	54.1	54.8	-0.04	-0.08
#5	80%	72.66	72.4	72.55	-0.11	-0.15
#6	100%	90.82	90.9	90.90	0.08	0.09
Measuring Range		100 ppm			Average Difference (%)	
					0.47	

Correlation Coefficient	1.0000	Slope	1.0013	Intercept	-0.1300
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025



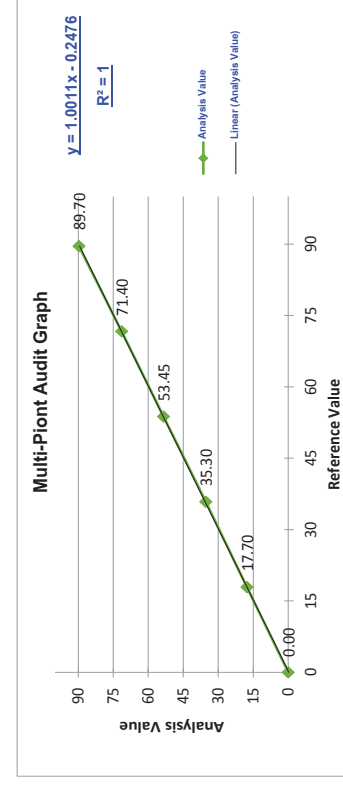
บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

Multi-Point Gas Test Report			
Equipment :	CO Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	48i-BZSCA	Serial Number:	1152640010
<b>Standard gas Information</b>			
Cylinder Number : ND27163			
Carbon Monoxide (CO) = 89.58 ppm			
Balance Nitrogen			
Zero air used Nitrogen 99.99%			

Multi-Point Gas Test Data						
Reference gas value		Analyzer Display Value			Error (ppm)	% Error
		#1	#2	Avg.		
Level	ppm					
#1	Zero	0.00	0.00	0.00	0.00	0.00
#2	20%	17.92	17.60	17.70	-0.22	-1.21
#3	40%	35.83	35.40	35.30	-0.53	-1.48
#4	60%	53.75	53.50	53.40	-0.30	-0.55
#5	80%	71.66	71.20	71.60	-0.26	-0.37
#6	100%	89.58	89.70	89.90	0.12	0.13
Measuring Range		100 ppm			Average Difference (%)	
					0.62	

Correlation Coefficient	1.0000	Slope	1.0011	Intercept	-0.2476
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025



บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

Multi-Point Gas Test Report			
Equipment :	CO <sub>2</sub> Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	410i-BZPECA	Serial Number:	1170530050

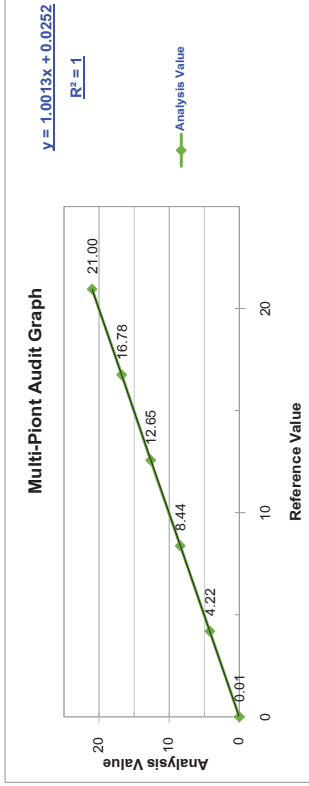
#### Standard gas Information

Cylinder Number : GN0018529	Expiration Date: Feb 14, 2027
Carbon Dioxide (CO <sub>2</sub> ) = 20.95 %	
Zero air used Nitrogen 99.999%	

#### Multi-Point Gas Test Data

Reference gas value Level	%	Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
		#1	#2			
#1	Zero	0.01	0.01	0.01	0.01	0.01
#2	20%	4.19	4.21	0.02	0.60	0.60
#3	40%	8.38	8.42	0.05	0.66	0.66
#4	60%	12.57	12.60	0.08	0.64	0.64
#5	80%	16.76	16.70	0.01	0.09	0.09
#6	100%	20.95	21.00	0.05	0.24	0.24
Measuring Range		25 %		Average Difference (%)		0.37

Correlation Coefficient	1.0000	Slope	1.0013	Intercept	0.0252
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed



บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

Multi-Point Gas Test Report			
Equipment :	O <sub>2</sub> Analyzer	Manufacturer :	ABB
Model :	AO2020	Serial Number:	3.269410.5

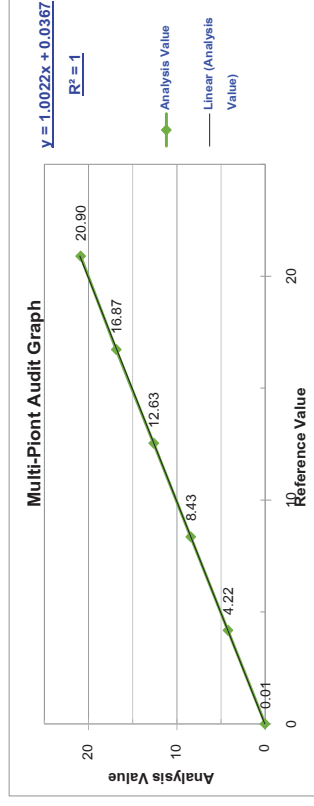
#### Standard gas Information

Cylinder Number : 4621265Y	Expiration Date: Nov 27, 2031
Oxygen (O <sub>2</sub> ) = 20.90 %	
Balance Nitrogen	

#### Multi-Point Gas Test Data

Reference gas value Level	%	Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
		#1	#2			
#1	Zero	0.00	0.01	0.01	0.01	0.01
#2	20%	4.18	4.22	0.04	0.84	0.84
#3	40%	8.36	8.42	0.07	0.84	0.84
#4	60%	12.54	12.61	0.09	0.72	0.72
#5	80%	16.72	16.84	0.15	0.90	0.90
#6	100%	20.90	20.90	0.00	0.00	0.00
Measuring Range		25 %		Average Difference (%)		0.55

Correlation Coefficient	1.0000	Slope	1.0022	Intercept	0.0367
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed





บริษัท เพทิโอร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.

7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chauchak , Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Calibration Drift, LDL and Time Gas Response Test Report

##### ANALYZER TESTED LIST

ANALYZER NAME	BRAND	MODEL	SERIAL NUMBER
CO ANALYZER	THERMO ELECTRON	48-BZSCA	1152640010
CO <sub>2</sub> ANALYZER	THERMO ELECTRON	410I-BZPECA	1170530050
O <sub>2</sub> ANALYZER	ABB	AO2020	3.269410.5
NO <sub>x</sub> ANALYZER	THERMO ELECTRON	42HL-BZSSDCA	1152640007
SO <sub>2</sub> ANALYZER	THERMO ELECTRON	43HL-DZCA	12403232473

##### CALIBRATION DRIFT TESTING REPORT

Parameters	Zero		Span				Judgement	
	14-Jan-25	15-Jan-25	%DRIFT	14-Jan-25	15-Jan-25	%DRIFT		
CO	0.289	0.291	0.00	89.60	89.70	0.02	PASSED	
CO <sub>2</sub>	0.017	0.030	0.033	21.00	21.00	0.00	PASSED	
O <sub>2</sub>	0.020	0.030	0.04	20.90	20.90	0.00	PASSED	
NO	0.009	0.012	0.00	90.10	90.10	0.00	PASSED	
NO <sub>x</sub>	0.019	0.023	0.00	91.30	91.30	0.00	PASSED	
SO <sub>2</sub>	0.310	0.280	-0.01	90.81	90.83	0.00	PASSED	

##### LOWER DETECTABLE LIMIT TESTING REPORT

Parameters	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	STDEV.
CO	0.266	0.274	0.277	0.280	0.269	0.256	0.248	0.250	0.249	0.261	0.012
CO <sub>2</sub>	0.017	0.014	0.010	0.016	0.018	0.011	0.018	0.019	0.019	0.014	0.003
O <sub>2</sub>	-0.058	-0.072	-0.079	-0.089	-0.096	-0.102	-0.103	-0.105	-0.107	-0.111	0.017
NO	0.009	0.008	0.006	0.006	0.006	0.008	0.009	0.005	0.005	0.006	0.002
NO <sub>x</sub>	0.013	0.015	0.014	0.012	0.012	0.013	0.015	0.015	0.013	0.010	0.002
SO <sub>2</sub>	0.276	0.293	0.285	0.286	0.265	0.289	0.258	0.238	0.261	0.259	0.018

##### CONCLUSION

CO Lower detectable limit (LDL) value is 0.012 PPM  
CO<sub>2</sub> Lower detectable limit (LDL) value is 0.003 %  
O<sub>2</sub> Lower detectable limit (LDL) value is 0.017 %VOL.  
NO Lower detectable limit (LDL) value is 0.002 PPM  
NO<sub>x</sub> Lower detectable limit (LDL) value is 0.002 PPM  
SO<sub>2</sub> Lower detectable limit (LDL) value is 0.018 PPM

##### GAS RESPONSE TIME TESTING REPORT

CO Response time	12	<20	Sec
CO <sub>2</sub> Response time	12	<20	Sec
O <sub>2</sub> Response time	8	<20	Sec
NO <sub>x</sub> Response time	15	<20	Sec
SO <sub>2</sub> Response time	15	<20	Sec
With Sampling Line 80 meter			
	60	<120	Sec

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 8 OF 10

PM-SGS CEI6s MOBILE#03-2025



บริษัท เพทิโอร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.

7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak , Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### VALIDATION RESULT TABLE

Parameter	ZERO			SPAN		Resultant Conclusion
	Ideal	Actual	Error	Ideal	Actual	
CO	0.00	0.294	0.29	905.9	758	-16.33 Not passed

#### CALIBRATION RESULT TABLE

Parameter	ZERO			SPAN		Resultant Conclusion
	Ideal	Actual	Error	Ideal	Actual	
CO	0.00	0.017	0.02	905.9	906	0.01 Passed

Remark: Percent Error of each Parameter must be less than  $\pm 5\%$  of reading.

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 9 OF 10

PM-SGS CEI6s MOBILE#03-2025



บริษัท เพโทร-อินสตรูเมนต์ จำกัด

PETRO-INSTRUMENTS CORP., LTD.

7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chauchak , Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

## Calibration Report

### Multi-Point Gas Test Report

Equipment :	CO Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	481-BZSCA	Serial Number:	1152640010
<b>Standard gas Information</b>			
Cylinder Number : ND57460			
Carbon Monoxide (CO) = 905.9 ppm			
Balance Nitrogen			
Zero air used Nitrogen 99.999%			
Expiration Date: Jul 20, 2029			

### Multi-Point Gas Test Data

Reference gas value	Analyzer Display Value			Error (ppm)	% Error	%ABS (Std.<±5%)
Level	#1	#2	Avg.			
#1 Zero	0.0	0.1	0.1	0.10	0.10	0.10
#2 20%	181.2	182.8	182.9	1.67	0.92	0.92
#3 40%	362.4	363.0	363.2	0.74	0.20	0.20
#4 60%	543.5	542.5	542.9	-0.84	-0.15	0.15
#5 80%	724.7	723.0	723.8	-1.22	-0.17	0.17
#6 100%	905.9	906.0	906.0	0.10	0.01	0.01
Measuring Range	1,000 ppm			Average Difference (%)		
				0.26		

Correlation Coefficient	1.0000	Slope	0.9984	Intercept	0.8238
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 10 OF 10

PM-SGS CEMS MOBILE#03-2025



HORIBA (THAILAND) LIMITED

480 Rungtornjaroen Rd., 1st Fl., Ratchadapisek Rd., Hual Khwang, Hual Khwang, Bangkok 10315 THAILAND  
Telephone +66 (0) 2861 5966 +66 (0) 2734-4234 Facsimile +66 (0) 2861 5200  
Website : <http://www.horiba.com>

### MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE

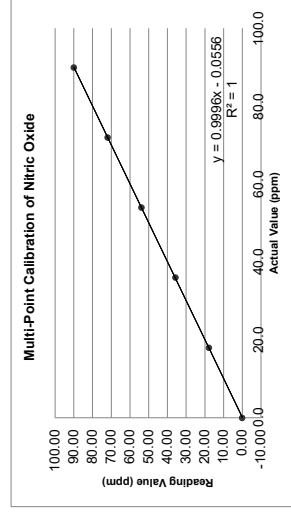
<b>Equipment Information</b>			
Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Background	0
Serial Number	V40KVOLD	Coefficient	0.9444
<b>Standard Gas Information</b>		Room Temperature	23.3 °C
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	NO
Concentration	99.999 %	Concentration	89.94 ppm
Expiration Date	-	Expiration Date	28-Sep-30
Measurement Range		Measurement Range	100
% Measurement Range		% Measurement Range	89.94

### Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.1	0.1	0.10	0.10	
20%	17.99	17.80	18.00	17.90	17.90	-0.09
40%	35.98	36.00	35.50	35.70	35.73	-0.24
60%	53.96	54.10	53.50	53.80	53.80	-0.16
80%	71.95	71.70	72.00	71.90	71.87	-0.09
100%	89.94	89.80	90.00	90.10	89.97	0.03
					Average	0.32
					Result	PASS

Slope	0.9996	Interception	-0.0556	Correlation Coefficient	1.0000
%Slope	-0.0445%	% Interception	-0.0556%	% Correlation Coefficient	-0.007%
Result	PASS	Result	PASS	Result	PASS

### Multi-Point Gas Test Chart



Test By Preechan Approve By Nishu Gani

Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE**

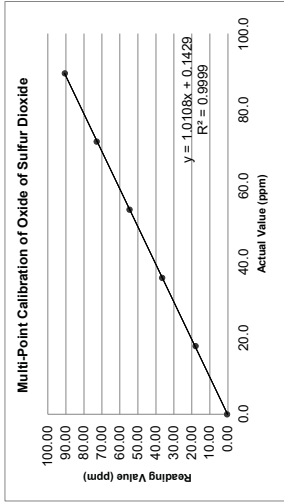
Equipment Information			
Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Background Coefficient	1
Serial Number	V40KVOLD	Room Temperature	23.3 °C
Standard Gas Information			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	SO2
Concentration	99.999 %	Concentration	89.58 ppm
Expiration Date	-	Expiration Date	28-Sep-30
		Measurement Range	200
		% Measurement Range	44.79

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.4	0.2	0.4	0.33	0.33
20%	17.92	18.20	17.60	17.80	17.87	-0.05
40%	35.83	37.00	36.20	36.10	36.43	0.60
60%	53.75	54.30	54.80	54.50	54.53	0.79
80%	71.66	72.80	73.10	72.60	72.83	1.17
100%	89.58	90.20	90.60	90.70	90.50	0.92
		Average			1.21	1.03
		Result			PASS	

Slope	1.0108	Interception	0.1429	Correlation Coefficient	1.0000
%Slope	1.0802%	% Interception	0.074%	% Correlation Coefficient	-0.026%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Bani

Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE**

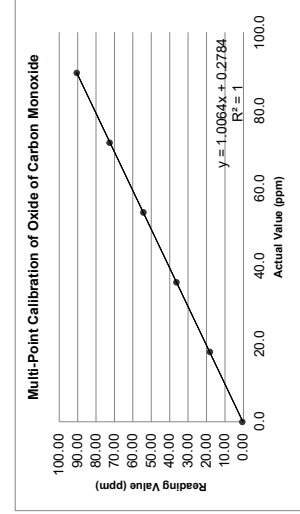
Equipment Information			
Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Background Coefficient	0
Serial Number	V40KVOLD	Room Temperature	1.4511 °C
23.3 °C			
Standard Gas Information			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	CO
Concentration	99.999 %	Concentration	89.58 ppm
Expiration Date	-	Expiration Date	28-Sep-30
		Measurement Range	200
		% Measurement Range	44.79

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.5	0.6	0.4	0.50	0.50
20%	17.92	18.00	18.10	18.20	18.10	0.18
40%	35.83	36.20	36.40	36.32	36.31	0.47
60%	53.75	54.20	54.11	54.34	54.22	0.47
80%	71.66	72.42	72.34	72.90	72.55	0.89
100%	89.58	90.10	90.80	90.50	90.47	0.89
		Average			1.09	0.99
		Result			PASS	

Slope	1.0064	Interception	0.2784	Correlation Coefficient	1.0000
%Slope	0.6448%	% Interception	0.1392%	% Correlation Coefficient	-0.0012%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Bani

Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE**

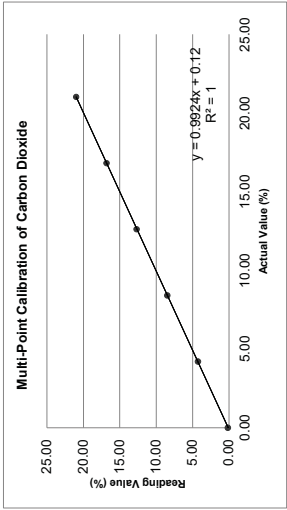
Equipment Information				21-Nov-24	
Manufacturer	Horiba	Calibration Date		1	
Model	HORIBA PG-350	Background Coefficient		1.0585	
Serial Number	V40KVOLD	Room Temperature		23.3	°C
Standard Gas Information				ND11246	
Zero Gas	17K686056	Cylinder Number		CO2	
Cylinder Number	N2	Component		21.02	%
Concentration	%	Expiration Date		8-Aug-30	
Expiration Date	-				
Measurement Range				30	
% Measurement Range				70.07	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.12	0.14	0.16	0.14	0.14
20%	4.20	4.21	4.32	4.23	4.25	0.05
40%	8.41	8.44	8.46	8.48	8.46	0.05
60%	12.61	12.70	12.67	12.65	12.67	0.06
80%	16.82	16.83	16.80	16.77	16.80	-0.02
100%	21.02	20.95	20.97	21.00	20.97	-0.05
		Average			0.52	
		Result			PASS	

Slope	0.9924	Interception	0.1200	Correlation Coefficient	1.0000
%Slope	-0.7612%	% Interception	0.4000%	% Correlation Coefficient	-0.0006%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Prechant Approve By Nakorn Boon  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF OXYGEN**

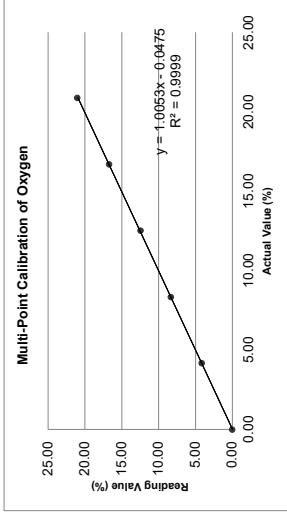
Equipment Information				21-Nov-24	
Manufacturer	Horiba	Calibration Date		25	
Model	HORIBA PG-350	Background Coefficient		1.0259	
Serial Number	V40KVOLD	Room Temperature		23.3	°C
Standard Gas Information				ND60790	
Zero Gas	17K686056	Cylinder Number		O2	
Cylinder Number	N2	Component		20.87	%
Concentration	%	Expiration Date		20-Jan-30	
Expiration Date	-				
Measurement Range				25	
% Measurement Range				83.48	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.01	0.00	0.02	0.01	0.01
20%	4.17	4.12	4.11	4.21	4.15	-0.03
40%	8.35	8.33	8.35	8.30	8.33	-0.02
60%	12.52	12.44	12.46	12.43	12.44	-0.08
80%	16.70	16.67	16.74	16.71	16.71	0.01
100%	20.87	21.00	21.02	21.05	21.02	0.15
		Average			0.47	
		Result			PASS	

Slope	1.0053	Interception	-0.0475	Correlation Coefficient	1.0000
%Slope	0.5294%	% Interception	-0.1893%	% Correlation Coefficient	-0.0036%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Prechant Approve By Nakorn Boon  
Date 2-Dec-24 Date 2-Dec-24



**LOWER DETECTABLE LIMIT TESTING REPORT**

<b>Equipment Information</b>	
Manufacturer	Horiba
Model	HORIBA PG-350
Serial Number	V40KV0LD
<b>Standard Gas Information</b>	
Zero Gas	17K686056
Cylinder Number	Component
	Concentration
	N2
	99.999 %
<b>Calibration Date</b>	
Room Temperature	
21-Nov-24	
23.3 °C	

Parameters	Measurement Range	Unit	Background	Coefficient
NO	100	ppm	1	0.9934
SO <sub>2</sub>	200	ppm	0	1.0684
CO	200	ppm	0	1.1705
CO <sub>2</sub>	30	%	0	1.004
O <sub>2</sub>	25	%	16	1.0078

**TESTING REPORT RESULTS**

Parameters	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	STDEV.
NO	0.20	0.20	0.30	0.20	0.10	0.30	0.20	0.30	0.10	0.10	0.082
SO <sub>2</sub>	0.30	0.20	0.30	0.40	0.40	0.40	0.50	0.60	0.50	0.40	0.115
CO	0.00	0.00	0.00	0.00	0.10	0.10	-0.10	0.10	-0.10	-0.10	0.082
CO <sub>2</sub>	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.01	0.02	0.007
O <sub>2</sub>	0.03	0.03	0.02	0.03	0.01	-0.01	-0.01	-0.02	-0.01	0.02	0.020

**Conclusion**

NO Lower detectable limit (LDL) value is 0.082 ppm  
SO<sub>2</sub> Lower detectable limit (LDL) value is 0.115 ppm  
CO Lower detectable limit (LDL) value is 0.082 ppm  
CO<sub>2</sub> Lower detectable limit (LDL) value is 0.007 % Vol.  
O<sub>2</sub> Lower detectable limit (LDL) value is 0.020 % Vol.

<b>Test By</b>	<i>Preechant</i>	<b>Approve By</b>	<i>Nakao Gani</i>
<b>Date</b>	2-Dec-24	<b>Date</b>	2-Dec-24

**MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE**

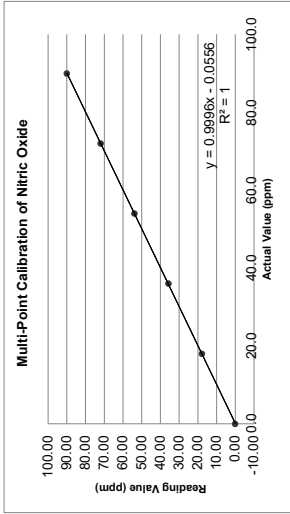
<b>Equipment Information</b>	
Manufacturer	Horiba
Model	HORIBA PG-350
Serial Number	V40KV0LD
<b>Standard Gas Information</b>	
Zero Gas	17K686056
Cylinder Number	Component
Concentration	N2
Expiration Date	-
<b>Calibration Date</b>	
Room Temperature	
21-Nov-24	
0	
0.9444	
23.3 °C	
<b>Span Gas</b>	
Cylinder Number	
ND58962	
Component	
NO	
Concentration	
89.94 ppm	
Expiration Date	
28-Sep-30	
<b>Measurement Range</b>	
100	
% Measurement Range	
89.94	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.1	0.1	0.1	0.10	0.10
20%	17.99	17.80	18.00	17.90	17.90	-0.09
40%	35.98	36.00	35.50	35.70	35.73	-0.24
60%	53.96	54.10	53.50	53.80	53.80	-0.16
80%	71.95	71.70	72.00	71.90	71.87	-0.09
100%	89.94	89.80	90.00	90.10	89.97	0.03
					<b>Average</b>	<b>0.32</b>
					<b>Result</b>	<b>PASS</b>

Slope	0.9996	Interception	-0.0556	Correlation Coefficient	1.0000
%Slope	-0.0445%	% Interception	-0.0556%	% Correlation Coefficient	-0.007%
<b>Result</b>	<b>PASS</b>	<b>Result</b>	<b>PASS</b>	<b>Result</b>	<b>PASS</b>

**Multi-Point Gas Test Chart**



<b>Test By</b>	<i>Preechant</i>	<b>Approve By</b>	<i>Nakao Gani</i>
<b>Date</b>	2-Dec-24	<b>Date</b>	2-Dec-24

**MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE**

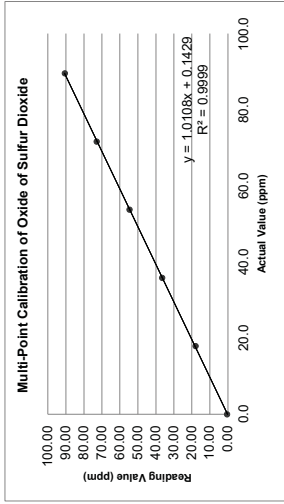
Equipment Information			
Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Background Coefficient	1
Serial Number	V40KVOLD	Room Temperature	23.3 °C
Standard Gas Information			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	SO2
Concentration	99.999 %	Concentration	89.58 ppm
Expiration Date	-	Expiration Date	28-Sep-30
		Measurement Range	200
		% Measurement Range	44.79

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.4	0.2	0.4	0.33	0.33
20%	17.92	18.20	17.60	17.80	17.87	-0.05
40%	35.83	37.00	36.20	36.10	36.43	0.60
60%	53.75	54.30	54.80	54.50	54.53	0.79
80%	71.66	72.80	73.10	72.60	72.83	1.17
100%	89.58	90.20	90.60	90.70	90.50	0.92
		Average			1.21	1.03
		Result			PASS	PASS

Slope	1.0108	Interception	0.1429	Correlation Coefficient	1.0000
%Slope	1.0802%	% Interception	0.074%	% Correlation Coefficient	-0.0026%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Bani  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE**

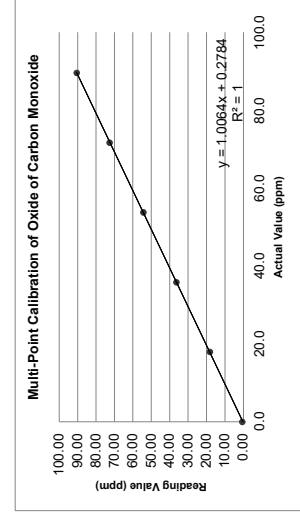
Equipment Information			
Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Background Coefficient	0
Serial Number	V40KVOLD	Room Temperature	1.4511 °C
23.3 °C			
Standard Gas Information			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	CO
Concentration	99.999 %	Concentration	89.58 ppm
Expiration Date	-	Expiration Date	28-Sep-30
		Measurement Range	200
		% Measurement Range	44.79

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.5	0.6	0.4	0.50	0.50
20%	17.92	18.00	18.10	18.20	18.10	0.18
40%	35.83	36.20	36.40	36.32	36.31	0.47
60%	53.75	54.20	54.11	54.34	54.22	0.47
80%	71.66	72.42	72.34	72.90	72.55	0.89
100%	89.58	90.10	90.80	90.50	90.47	0.89
		Average			1.09	0.99
		Result			PASS	PASS

Slope	1.0064	Interception	0.2784	Correlation Coefficient	1.0000
%Slope	0.6448%	% Interception	0.1392%	% Correlation Coefficient	-0.0012%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Bani  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE**

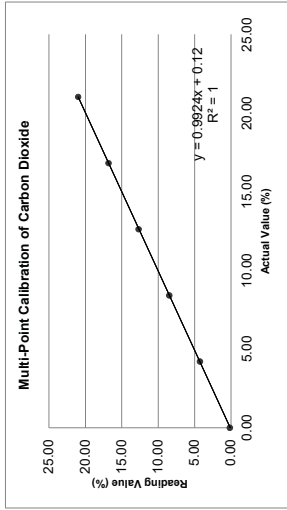
Equipment Information				21-Nov-24	
Manufacturer	Horiba	Calibration Date		1	
Model	HORIBA PG-350	Background Coefficient		1.0585	
Serial Number	V40KVOLD	Room Temperature		23.3	°C
Standard Gas Information				ND11246	
Zero Gas	17K686056	Cylinder Number		CO2	
Cylinder Number	N2	Component		21.02	%
Concentration	%	Concentration		6-Aug-30	
Expiration Date	-	Expiration Date			
Measurement Range				30	
% Measurement Range				70.07	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.12	0.14	0.16	0.14	0.14
20%	4.20	4.21	4.32	4.23	4.25	0.05
40%	8.41	8.44	8.46	8.48	8.46	0.05
60%	12.61	12.70	12.67	12.65	12.67	0.06
80%	16.82	16.83	16.80	16.77	16.80	-0.02
100%	21.02	20.95	20.97	21.00	20.97	-0.05
		Average			0.52	
		Result			PASS	

Slope	0.9924	Interception	0.1200	Correlation Coefficient	1.0000
%Slope	-0.7612%	% Interception	0.4000%	% Correlation Coefficient	-0.0006%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Boon  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF OXYGEN**

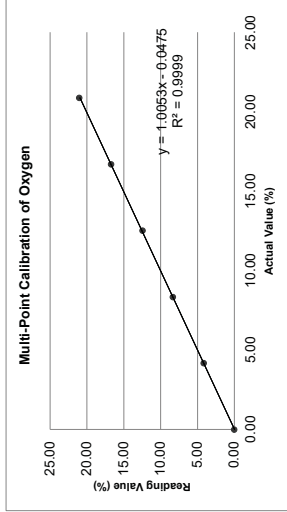
Equipment Information				21-Nov-24	
Manufacturer	Horiba	Calibration Date		25	
Model	HORIBA PG-350	Background Coefficient		1.0259	
Serial Number	V40KVOLD	Room Temperature		23.3	°C
Standard Gas Information				ND60790	
Zero Gas	17K686056	Cylinder Number		O2	
Cylinder Number	N2	Component		20.87	%
Concentration	%	Concentration		20-Jan-30	
Expiration Date	-	Expiration Date			
Measurement Range				25	
% Measurement Range				83.48	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.01	0.00	0.02	0.01	0.01
20%	4.17	4.12	4.11	4.21	4.15	-0.03
40%	8.35	8.33	8.35	8.30	8.33	-0.02
60%	12.52	12.44	12.46	12.43	12.44	-0.08
80%	16.70	16.67	16.74	16.71	16.71	0.01
100%	20.87	21.00	21.02	21.05	21.02	0.15
		Average			0.47	
		Result			PASS	

Slope	1.0053	Interception	-0.0475	Correlation Coefficient	1.0000
%Slope	0.5294%	% Interception	-0.1893%	% Correlation Coefficient	-0.0036%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preechant Approve By Nakorn Boon  
Date 2-Dec-24 Date 2-Dec-24



**BANGKOK INDUSTRIAL GAS CO., LTD.**  
1 Park Silom Tower, 24th Floor, Convent Road  
Silom, Bangrak, Bangkok 10500 Thailand  
Tel : (662) 481-6789 Fax : (662) 481-6790

Customer Name	: SGS (Thailand) Co., Ltd.			Delivery Date	: 21 Feb 2024		
Product	: 1100060			Analyzed Date	:		
Product Name	: CY N2 UHP 7M3 47S CGA580			Best if used by	: -		
Cylinder Type	: 47 LITERS STEEL			Delivery order	: 3300191491		
Cylinder Valve	: CGA 580			Inspection lot	: 040000035171		
Filling Pressure	: 2000 PSIG @ 27°C			Gas content	: 7 M3		
COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD

Purity	%	99.9990				
Oxygen	ppm(V)		<3.0000			
Moisture	ppm(V)		<3.0000			
Carbon Monoxide	ppm(V)		<1.0000			
Carbon Dioxide	ppm(V)		<1.0000			
Total Hydrocarbon as CH4	ppm(V)		<1.0000			

Batch : 190224N201,120224N201

Sampling Cylinder :

Cylinder Serial Number : D045082,13D126013,17K686056,20K047009

Remark :

This certificate is issued electronically and is valid without a signature.



**HORIBA (THAILAND) LIMITED**  
608 Hongkong Road Bldg. 1st, 2nd Fl., Klongkum Rd., Klongkum, Bangkok 10110 THAILAND  
Tel : (662) 2734-4204 Fax : (662) 2734-4204 E-mail : info@horiba.co.th  
Website : http://www.horiba.com

### LOWER DETECTABLE LIMIT TESTING REPORT

#### Equipment Information

Manufacturer	Horiba	Calibration Date	21-Nov-24
Model	HORIBA PG-350	Room Temperature	23.3 °C
Serial Number	V40KV0LD		

#### Standard Gas Information

Zero Gas		Component	N2
Cylinder Number	17K686056	Concentration	99.999 %

Parameters	Measurement Range	Unit	Background	Coefficient
NO	100	ppm	1	0.9934
SO <sub>2</sub>	200	ppm	0	1.0684
CO	200	ppm	0	1.1705
CO <sub>2</sub>	30	%	0	1.004
O <sub>2</sub>	25	%	16	1.0078

#### TESTING REPORT RESULTS

Parameters	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	STDEV.
NO	0.20	0.20	0.30	0.20	0.10	0.30	0.20	0.30	0.10	0.10	0.082
SO <sub>2</sub>	0.30	0.20	0.30	0.40	0.40	0.40	0.50	0.60	0.50	0.40	0.115
CO	0.00	0.00	0.00	0.00	0.10	0.10	-0.10	0.10	-0.10	-0.10	0.082
CO <sub>2</sub>	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.01	0.02	0.007
O <sub>2</sub>	0.03	0.03	0.02	0.03	0.01	-0.01	-0.01	-0.02	-0.01	0.02	0.020

#### Conclusion

NO Lower detectable limit (LDL) value is	0.082	ppm
SO <sub>2</sub> Lower detectable limit (LDL) value is	0.115	ppm
CO Lower detectable limit (LDL) value is	0.082	ppm
CO <sub>2</sub> Lower detectable limit (LDL) value is	0.007	% Vol.
O <sub>2</sub> Lower detectable limit (LDL) value is	0.020	% Vol.

Test By

*Preachant*

Approve By

*Nakorn Ravi*

Date

2-Dec-24

Date

2-Dec-24





## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD

Cylinder Number: E04N199E3HA0031

Laboratory: GN0029540

PGVP Number: A12024

Gas Code: CO,NO,NOX,SO2,BALN

Expiration Date: Mar 05, 2032

Reference Number: 160-402968380-1

Cylinder Volume: 247.0 CF

Cylinder Pressure: 2215 PSIG

Valve Outlet: 660

Certification Date: Mar 05, 2024

Expiration Date: Mar 05, 2032

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All components are certified to the stated purity level. The results relate only to the material tested and are not valid for other materials except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

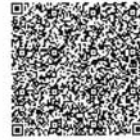
ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
NOX	90.00 PPM	90.66 PPM	G1	02/27/2024, 03/05/2024
CARBON MONOXIDE	90.00 PPM	90.13 PPM	G1	02/27/2024
NITRIC OXIDE	90.00 PPM	90.65 PPM	G1	02/27/2024, 03/05/2024
SULFUR DIOXIDE	90.00 PPM	89.35 PPM	G1	02/27/2024, 03/05/2024
NITROGEN	Balance			
Total Relative Uncertainty				
+/- 0.6% NIST Traceable				
+/- 0.5% NIST Traceable				
+/- 0.6% NIST Traceable				
+/- 0.8% NIST Traceable				
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	110101-08	KAL003090	97.31 PPM CARBON MONOXIDE/NITROGEN	May 25, 2028
PRM	C2219101	APE1514048	100.19 PPM NITRIC OXIDE/NITROGEN	Feb 26, 2025
GMIS	2023042530	CC754387	98.54 PPM NITRIC OXIDE/NITROGEN	Apr 25, 2031
PRM	C2382001.1	D153445	9.87 PPM NITROGEN DIOXIDE/NITROGEN	Nov 22, 2024
GMIS	124206899128	CC323207	4.239 PPM NITROGEN DIOXIDE/NITROGEN	Jan 04, 2027
NTRM	160102-22	KAL003820	97.69 PPM SULFUR DIOXIDE/NITROGEN	Nov 01, 2027
The SRM, NTRM, PRM, or RGM noted above is only in reference to the GMS used in the assay and not part of the analysis.				
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Feb 01, 2024		
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Feb 08, 2024		
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Feb 22, 2024		
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Feb 15, 2024		

Triad Data Available Upon Request

NOTES: Gross Weight: 48.2 Kg

Net Weight: 8.1 Kg

PO# 5224000763



*Michael C. Miller*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD

Cylinder Number: E02N188E200000C

Laboratory: 5139910Y

PGVP Number: A12023

Gas Code: O2,BALN

Expiration Date: Nov 27, 2023

Reference Number: 160-402891090-1

Cylinder Volume: 216.6 CF

Cylinder Pressure: 2014 PSIG

Valve Outlet: 590

Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All components are certified to the stated purity level. The results relate only to the material tested and are not valid for other materials except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
OXYGEN	12.00 %	12.09 %	G1	11/27/2023
NITROGEN	Balance			
Total Relative Uncertainty				
+/- 0.4% NIST Traceable				
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
Total Relative Uncertainty				
+/- 0.4%				
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
SIEMENS OXYMAT 6 - N1-WIS-S51 - O2	PARAMAGNETIC	Nov 08, 2023		

Triad Data Available Upon Request

NOTES: Gross Weight: 59.3Kg

Net Weight: 7.2 Kg

PO# 522306228



*Rich Allen*  
Approved for Release



**CERTIFICATE OF ANALYSIS**

**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N179E20004DC

Cylinder Number: 4621265Y

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12023

Gas Code: O2.BALN

Reference Number: 160-402891088-1

Cylinder Volume: 218.0 CF

Cylinder Pressure: 2014 PSIG

Valve Outlet: 580

Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)", document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
OXYGEN	21.00 %	20.90 %	GI	11/27/2023
Total Relative Uncertainty				
+/- 0.5% NIST Traceable				
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle			
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC			
Last Multipoint Calibration				Nov 08, 2023

Triad Data Available Upon Request

NOTES: Gross Weight: 59.0 Kg

Net Weight: 7.4 Kg

PO# 5223006228



*Richard A. ...*  
Approved for Release

**CERTIFICATE OF ANALYSIS**

**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N187E3HACAH

Cylinder Number: ND54008

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12022

Gas Code: CO2.BALN

Customer PO Number: 5222003790

Reference Number: 160-402517687-1

Cylinder Volume: 261.0 CF

Cylinder Pressure: 2214 PSIG

Valve Outlet: 580

Certification Date: Aug 26, 2022

Expiration Date: Aug 26, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)", document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
CARBON DIOXIDE	13.00 %	13.00 %	G1	08/26/2022
NITROGEN	Balance			
Total Relative Uncertainty				
+/- 0.5% NIST Traceable				
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle			
HORIBA VA5011 T536VU9P NDIR CO2	NDIR			
Last Multipoint Calibration			Aug 03, 2022	

Triad Data Available Upon Request

NOTES: NET WEIGHT 9.17 Kgs

GROSS WEIGHT 49.06 Kgs

PO# 5222003790



*Richard A. ...*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E02N179E3HA0000  
Cylinder Number: GN0018529  
Laboratory: 124 - Riverton (SAP) - NJ  
PGVP Number: B52019  
Gas Code: CO2.BALN  
Reference Number: 82-401420321-1  
Cylinder Volume: 271.2 CF  
Cylinder Pressure: 2214 PSIG  
Valve Outlet: 580  
Certification Date: Feb 14, 2019  
Expiration Date: Feb 14, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/016. This document describes the procedures for assaying and certifying calibration standards. The procedures are designed to ensure that the total analytical uncertainty is stated below with a confidence level of 95%. There are no significant impurities in this gas. The use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	21.00 %	20.95 %	G1	+/- 0.8% NIST Traceable
NITROGEN	Balance			02/14/2019
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	12081545	GC354843	19.87 % CARBON DIOXIDE/NITROGEN	Jan 11, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model		Analytical Principle		
Horiba VIA 510-CO2-15GYCXEG		NDIR		
		Last Multipoint Calibration		
		Feb 04, 2019		

#### NOTES:

Gross Weight: 109.98 lbs.  
Net Weight: 21.95 lbs.  
PO# 5219000555

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/031. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



Approved for Release



BANGKOK INDUSTRIAL GAS CO., LTD.  
1 Park Silom Tower, 24th Floor, Convent Road  
Silom, Bangkok, Bangkok 10500 Thailand  
Tel : (662) 481-6789 Fax : (662) 481-6790

Customer Name	: SGS (Thailand) Limited				Delivery Date	: 03 Jul 2025	
Product	: 1100060				Analysis Date	:	
Product Name	: CY N2 UHP 7M3 47S CGA580				Best if Use By	:	
Cylinder Type	: 47 LITERS STEEL				Delivery Order	: 3300010176	
Cylinder Valve	: CGA 580				Inspection Lot	: 40000005366	
Filling Pressure	: 2000 PSIG @ 27°C				Gas Content	: 7 M3	
COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD
Purity	%	99.9990					
Oxygen	ppm(V)	<3.0000					
Moisture	ppm(V)	<3.0000					
Carbon Monoxide	ppm(V)	<1.0000					
Carbon Dioxide	ppm(V)	<1.0000					
Total Hydrocarbon as CH4	ppm(V)	<1.0000					

Batch : 010725N201

Sampling Cylinder :

Cylinder Serial Number : D892075,11D062106,D9143166,11D126047

Remark :

This certificate is issued electronically and is valid without a signature.





## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: ED4N199E3HAC87C  
Reference Number: 160-402529442-1  
Cylinder Volume: 225.0 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2001 PSIG  
PGVP Number: A12022  
Valve Outlet: 660  
Gas Code: CO,NO,NOX,SO2,BALN  
Certification Date: Sep 28, 2022  
Expiration Date: Sep 28, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder Below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable
CARBON MONOXIDE	90.00 PPM	89.51 PPM	G1	+/- 0.6% NIST Traceable
NITRIC OXIDE	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable
SULFUR DIOXIDE	90.00 PPM	89.71 PPM	G1	+/- 0.9% NIST Traceable
NITROGEN	Balance			

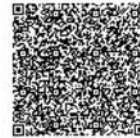
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	09010212	KAL004777	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%
PRM	12395	D887660	9.91 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
NTRM	200610-16	CC733109	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%
GMIS	124206889110	CC322674	4.474 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
NTRM	160102-18	KAL003796	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%

The SRM, PRM or EGM noted above is only in reference to the GMS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet ISS50 FTIR AUP2010245 CO	FTIR	Sep 15, 2022
Nicolet ISS50 FTIR AUP2010245 NO	FTIR	Sep 22, 2022
Nicolet ISS50 FTIR AUP2010245 NO2	FTIR	Sep 08, 2022
Nicolet ISS50 FTIR AUP2010245 SO2	FTIR	Sep 01, 2022

Triad Data Available Upon Request

Net Weight: 7.4 Kg  
Gross Weight: 46.8 Kg  
PO# 5222003790



*Don Vane*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: E02N198E200000C  
Reference Number: 160-402891090-1  
Cylinder Volume: 216.6 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2014 PSIG  
PGVP Number: A12023  
Valve Outlet: 590  
Gas Code: O2,BALN  
Certification Date: Nov 27, 2023  
Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a mole/mole basis unless otherwise noted. The results are stated in this report and are not subject to change without the written approval of the laboratory. Do Not Use This Cylinder Below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	12.00 %	12.07 %	G1	+/- 0.4% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	+/- 0.4%

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC	Nov 08, 2023

Triad Data Available Upon Request

Net Weight: 7.2 Kg  
Gross Weight: 59.3Kg  
PO# 5223006228



*Rick Allen*  
Approved for Release



## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N179E20004DC

Cylinder Number: 5064040Y

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12023

Gas Code: O2,BALN

Reference Number: 160-402891088-1

Cylinder Volume: 218.0 CF

Cylinder Pressure: 2014 PSIG

Valve Outlet: 590

Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated in the table below. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this report for any other purpose.

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
OXYGEN	21.00 %	20.87 %	+/- 0.5% NIST Traceable	11/27/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
SIEMENS OXYMAT 6 - N1-WS-951 - O2	PARAMAGNETIC		Nov 08, 2023	

Triad Data Available Upon Request

NOTES: Gross Weight: 59.0 Kg

Net Weight: 7.4 Kg

PO# 5223006228



*Approved for Release*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N187E3HA0000

Cylinder Number: ND14299

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12023

Gas Code: CO2,BALN

Reference Number: 160-402897086-1

Cylinder Volume: 261.0 CF

Cylinder Pressure: 2214 PSIG

Valve Outlet: 580

Certification Date: Mar 20, 2023

Expiration Date: Mar 20, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated in the table below. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this report for any other purpose.

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	13.00 %	12.97 %	+/- 0.4% NIST Traceable	03/20/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VUPR NDIR CO2	NDIR		Mar 15, 2023	

Triad Data Available Upon Request

NOTES: Gross Weight: 48.3 Kg

Net Weight: 9.2 Kg

PO# 5223001128



*Approved for Release*  
Approved for Release







## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: ED4N199E3HAC87C  
Reference Number: 160-402529442-1  
Cylinder Volume: 225.0 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2001 PSIG  
PGVP Number: A12022  
Valve Outlet: 660  
Gas Code: CO,NO,NOX,SO2,BALN  
Certification Date: Sep 28, 2022  
Expiration Date: Sep 28, 2030

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

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable
CARBON MONOXIDE	90.00 PPM	89.51 PPM	G1	+/- 0.6% NIST Traceable
NITRIC OXIDE	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable
SULFUR DIOXIDE	90.00 PPM	89.71 PPM	G1	+/- 0.9% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	09010212	KAL004777	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%
PRM	12395	D887660	9.91 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
NTRM	200610-16	CC733109	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%
GMIS	124206889110	CC322674	4.474 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
NTRM	160102-18	KAL003796	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%
The SRM, PRM or ECM noted above is only in reference to the GMS used in the assay and not part of the analysis.				
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
Nicolet ISS50 FTIR AUP2010245 CO	FTIR		Sep 15, 2022	
Nicolet ISS50 FTIR AUP2010245 NO	FTIR		Sep 22, 2022	
Nicolet ISS50 FTIR AUP2010245 NO2	FTIR		Sep 08, 2022	
Nicolet ISS50 FTIR AUP2010245 SO2	FTIR		Sep 01, 2022	

#### Triad Data Available Upon Request

Net Weight: 7.4 Kg  
Gross Weight: 46.8 Kg  
PO# 5222003790



*Don Vane*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: E02N198E200000C  
Reference Number: 160-402891090-1  
Cylinder Volume: 216.6 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2014 PSIG  
PGVP Number: A12023  
Valve Outlet: 590  
Gas Code: O2,BALN  
Certification Date: Nov 27, 2023  
Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a mole/mole basis unless otherwise noted. The results are stated in this report and are not subject to full method approval of the laboratory. Do Not Use This Cylinder Below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	12.00 %	12.07 %	G1	+/- 0.4% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC		Nov 08, 2023	

#### Triad Data Available Upon Request

Net Weight: 7.2 Kg  
Gross Weight: 59.3Kg  
PO# 5223006228



*Rick Allen*  
Approved for Release



## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
GAS CO LTD  
Part Number: E02N187E3HA0000  
Cylinder Number: ND14299  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12023  
Gas Code: CO2,BALN

Reference Number: 160-402687086-1  
Cylinder Volume: 261.0 CF  
Cylinder Pressure: 2214 PSIG  
Valve Outlet: 580  
Certification Date: Mar 20, 2023

Expiration Date: Mar 20, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. This report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
CARBON DIOXIDE NITROGEN	13.00 % Balance	12.97 %	G1	03/20/2023
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VUP9 NDIR CO2	NDIR		Mar 15, 2023	

#### Triad Data Available Upon Request

NOTES: Gross Weight: 48.3 Kg  
Net Weight: 9.2 Kg  
PO# 5223001128



*Richard A. Miller*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
GAS CO LTD  
Part Number: E02N179E3HAC2EC  
Cylinder Number: ND60790  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12022  
Gas Code: O2,BALN

Reference Number: 160-402311012-1  
Cylinder Volume: 250.6 CF  
Cylinder Pressure: 2214 PSIG  
Valve Outlet: 590  
Certification Date: Jan 20, 2022

Expiration Date: Jan 20, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
OXYGEN NITROGEN	21.00 % Balance	20.87 %	G1	01/20/2022
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	08010230	K005228	23.20 % OXYGEN/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
SIEMENS OXYMAT 6-N145-951-O2	PARAMAGNETIC		Jan 06, 2022	

#### Triad Data Available Upon Request

NOTES: Gross Weight: 49.5 Kg  
Net Weight: 9 Kg  
Cylinder: 300 Aluminum  
Valve: CGA 590 Brass  
PO# 5221006285



*Charles*  
Approved for Release

# CERTIFICATE OF ANALYSIS

## Grade of Product: EPA PROTOCOL STANDARD

**Customer:** BANGKOK INDUSTRIAL  
**Part Number:** GAS CO LTD  
**Cylinder Number:** E02N179E3HA0000  
**Laboratory:** ND11246  
**PGVP Number:** 124 - Plumsteadville - PA  
**Gas Code:** A12022  
**CO2 BALN**

**Reference Number:** 160-402500111-1  
**Cylinder Volume:** 271.0 CF  
**Cylinder Pressure:** 2214 PSIG  
**Valve Outlet:** 580  
**Certification Date:** Aug 08, 2022  
**Expiration Date:** Aug 08, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/631, using the assay procedures listed. Analytical Methodology does not require correction for analytical uncertainty. This cylinder was assayed using a gravimetric method. The balance used for this assay was calibrated against NIST weights and is traceable to the NIST. All concentrations are on a mole basis unless otherwise noted.

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	21.00 %	21.02 %	+/- 0.4% NIST Traceable	08/08/2022
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NITRM	200605-04	6088266Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model		Analytical Principle		
HORIBA VA5011 TS16V19P		NDIR		
Last Multipoint Calibration		Aug 03, 2022		

### Triad Data Available Upon Request

NOTES: Gross Weight: 49.2 Kg  
Net Weight: 10.0 Kg  
PO# 5222003790



Approved for Release

Page 1 of 1



### Analyzer Calibration Data Sheet

Job No.	62010064-2	City	St. Louis, MO
Client Name	PLUMSTEADVILLE	Pre Calibration	10/05/19
Plant Name	PLUMSTEADVILLE	Post Calibration	10/05/19
Location	PLUMSTEADVILLE	Back Name	10/05/19

Parameter	NO	Brand/Model	Thermo 434L	Serial No.	112940027
Span Value	100	ppm		Equipment ID	CEMTE 11231
Calibration Span	45.39	ppm		Cylinder No (Zero)	130120013
Concentration (Mid-level)	50.05	ppm		Cylinder No (Mid-level)	130120013
Concentration (High-level)	50.05	ppm		Cylinder No (High-level)	030029207

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	SO <sub>2</sub>	Brand/Model	Thermo 434L	Serial No.	124032473
Span Value	100	ppm		Equipment ID	CEMTE 11231
Calibration Span	45.39	ppm		Cylinder No (Zero)	130120013
Concentration (Mid-level)	50.05	ppm		Cylinder No (Mid-level)	030029207
Concentration (High-level)	50.05	ppm		Cylinder No (High-level)	030029207

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	CO	Brand/Model	Thermo 48	Serial No.	112940010
Span Value	100	ppm		Equipment ID	CEMTE 11231
Calibration Span	45.39	ppm		Cylinder No (Zero)	130120013
Concentration (Mid-level)	50.05	ppm		Cylinder No (Mid-level)	030029207
Concentration (High-level)	50.05	ppm		Cylinder No (High-level)	030029207

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	O <sub>2</sub>	Brand/Model	Thermo 434L	Serial No.	32041015
Span Value	20	% vol		Equipment ID	CEMTE 11231
Calibration Span	20.05	% vol		Cylinder No (Zero)	130120013
Concentration (Mid-level)	20.05	% vol		Cylinder No (Mid-level)	130120013
Concentration (High-level)	20.05	% vol		Cylinder No (High-level)	130120013

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	CO <sub>2</sub>	Brand/Model	Thermo 434L	Serial No.	112940003
Span Value	20.05	% vol		Equipment ID	CEMTE 11231
Calibration Span	20.05	% vol		Cylinder No (Zero)	130120013
Concentration (Mid-level)	20.05	% vol		Cylinder No (Mid-level)	130120013
Concentration (High-level)	20.05	% vol		Cylinder No (High-level)	130120013

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	CH <sub>4</sub>	Brand/Model	Thermo 434L	Serial No.	112940003
Span Value	20.05	% vol		Equipment ID	CEMTE 11231
Calibration Span	20.05	% vol		Cylinder No (Zero)	130120013
Concentration (Mid-level)	20.05	% vol		Cylinder No (Mid-level)	130120013
Concentration (High-level)	20.05	% vol		Cylinder No (High-level)	130120013

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Parameter	NH <sub>3</sub>	Brand/Model	Thermo 434L	Serial No.	112940003
Span Value	20.05	% vol		Equipment ID	CEMTE 11231
Calibration Span	20.05	% vol		Cylinder No (Zero)	130120013
Concentration (Mid-level)	20.05	% vol		Cylinder No (Mid-level)	130120013
Concentration (High-level)	20.05	% vol		Cylinder No (High-level)	130120013

Status	Gas Cylinder	Analyzer Response	Value	Difference	Result
Zero gas	(ppm)	(ppm)	(ppm)	(%)	(%)
Mid-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)
High-level gas	(ppm)	(ppm)	(ppm)	(%)	(%)

Inspector: *Kenneth M*  
Apprver: *Mingm S.*

Date: 10-Oct-26





System Calibration Data Sheet

Job No.	50005904.2
Client Name	PANCHPANTHAK
Plant Name	PANCHPANTHAK
Calibration	15/03/2024

Date	09/03/2025
Pre Calibration	10/02/2025
Post Calibration	10/02/2025
Serial No.	11526.0007
Equipment ID	CEMS 11521

Brand/Model	Thermo 43-H
Parameter	NO
Span Value	ppm
Calibration Span	100
Mid or High Level Gas	100

Initial Value	Criteria	Final Value	Criteria
Analyzer Calibration Response (%)	Value (%)	Result (%)	Drift (%)
Zero gas (A)	45%	45%	45%
Zero gas (B)	45%	45%	45%
Zero gas (C)	45%	45%	45%
Zero gas (D)	45%	45%	45%
Zero gas (E)	45%	45%	45%
Zero gas (F)	45%	45%	45%
Zero gas (G)	45%	45%	45%
Zero gas (H)	45%	45%	45%
Zero gas (I)	45%	45%	45%
Zero gas (J)	45%	45%	45%
Zero gas (K)	45%	45%	45%
Zero gas (L)	45%	45%	45%
Zero gas (M)	45%	45%	45%
Zero gas (N)	45%	45%	45%
Zero gas (O)	45%	45%	45%
Zero gas (P)	45%	45%	45%
Zero gas (Q)	45%	45%	45%
Zero gas (R)	45%	45%	45%
Zero gas (S)	45%	45%	45%
Zero gas (T)	45%	45%	45%
Zero gas (U)	45%	45%	45%
Zero gas (V)	45%	45%	45%
Zero gas (W)	45%	45%	45%
Zero gas (X)	45%	45%	45%
Zero gas (Y)	45%	45%	45%
Zero gas (Z)	45%	45%	45%

Parameter	SO <sub>2</sub>
Span Value	100
Calibration Span	100
Mid or High Level Gas	100

Brand/Model	Thermo 43-H
Parameter	CO
Span Value	100
Calibration Span	100
Mid or High Level Gas	100

Brand/Model	Thermo 43-H
Parameter	O <sub>2</sub>
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	ACC200
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	CO <sub>2</sub>
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	CH <sub>4</sub>
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20



Analyzer Calibration Data Sheet

Job No.	50005904.2
Client Name	PANCHPANTHAK
Plant Name	PANCHPANTHAK
Calibration	15/03/2024

Date	09/03/2025
Pre Calibration	10/02/2025
Post Calibration	10/02/2025
Serial No.	11526.0007
Equipment ID	CEMS 11521

Brand/Model	Thermo 43-H
Parameter	NO
Span Value	ppm
Calibration Span	100
Mid or High Level Gas	100

Initial Value	Criteria	Final Value	Criteria
Analyzer Calibration Response (%)	Value (%)	Result (%)	Drift (%)
Zero gas (A)	45%	45%	45%
Zero gas (B)	45%	45%	45%
Zero gas (C)	45%	45%	45%
Zero gas (D)	45%	45%	45%
Zero gas (E)	45%	45%	45%
Zero gas (F)	45%	45%	45%
Zero gas (G)	45%	45%	45%
Zero gas (H)	45%	45%	45%
Zero gas (I)	45%	45%	45%
Zero gas (J)	45%	45%	45%
Zero gas (K)	45%	45%	45%
Zero gas (L)	45%	45%	45%
Zero gas (M)	45%	45%	45%
Zero gas (N)	45%	45%	45%
Zero gas (O)	45%	45%	45%
Zero gas (P)	45%	45%	45%
Zero gas (Q)	45%	45%	45%
Zero gas (R)	45%	45%	45%
Zero gas (S)	45%	45%	45%
Zero gas (T)	45%	45%	45%
Zero gas (U)	45%	45%	45%
Zero gas (V)	45%	45%	45%
Zero gas (W)	45%	45%	45%
Zero gas (X)	45%	45%	45%
Zero gas (Y)	45%	45%	45%
Zero gas (Z)	45%	45%	45%

Parameter	SO <sub>2</sub>
Span Value	100
Calibration Span	100
Mid or High Level Gas	100

Brand/Model	Thermo 43-H
Parameter	CO
Span Value	100
Calibration Span	100
Mid or High Level Gas	100

Brand/Model	Thermo 43-H
Parameter	O <sub>2</sub>
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	ACC200
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	CO <sub>2</sub>
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

Brand/Model	Thermo 43-H
Parameter	% vol
Span Value	20
Calibration Span	20
Mid or High Level Gas	20

## System Calibration Data Sheet

Job No. 50000604  
Client Name RSC Partners  
Printed Name RSC Partners  
Location Bangkok  
Date 03/10/2025  
Pre Calibration 12.78 - 12.36  
Post Calibration 12.78 - 12.36  
Stock Name H2O2 35

Parameter NO Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Parameter Brand/Model H2O2/PC-50 Serial No. VARIOLO  
Span Value 0.00 ppm  
Calibration Span 45.00 ppm  
Mid or High Level Gas 50.00 ppm

Status	Analyzer Calibration Response (A)	Initial Value		System Bias (% of Span)		Final Value		Criteria		Drift		Criteria	
		Value	Result	Value	Result	Verification Response (B)	System Bias (% of Span)	Value	Result	Value	Result	Value	Result
Zero gas	0.00	0.11	25%	0.11	25%	0.20	0.22	45%	PASS	0.11	25%	0.11	25%
Upgrade gas	45.00	45.00	25%	45.00	25%	44.95	44.95	45%	PASS	0.05	10%	0.05	10%

Inspector Mingyuan S.  
Date 07-Oct-25

Approver Kanyadee M.  
Date 07-Oct-25

## Meter Console Verification

Dry Gas Meter ID. : ENSS 16113 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : SY

## Wet gas meter Information

Wet gas Brand : Shinagawa Wet gas S/N : 544122  
Wet gas Model : W-NK-2.5A Expire Date : 10-Jun-2027

Office Setting $\Delta H@$ (mm H <sub>2</sub> O)	Wet gas		Metering System		Time (min )	YI	$\Delta H@$
	$V_w$ (L)	$T_w$ (°C)	$V_d$ (L)	$T_m$ (°C)			
13	138.72	25.2	140.0	24.0	12.19	0.9856	48.762
13	138.06	25.0	140.0	24.0	12.22	0.9816	49.564
26	138.64	24.8	140.0	24.5	8.36	0.9870	47.439
26	137.28	24.5	140.0	25.0	8.38	0.9797	48.221
40	273.76	24.3	280.0	25.0	14.08	0.9764	50.367
40	272.64	24.1	280.0	25.0	14.04	0.9730	50.236
50	270.74	23.9	280.0	25.5	12.31	0.9674	50.333
50	271.20	23.8	280.0	26.0	12.32	0.9710	50.178
70	273.46	23.7	280.0	26.0	10.29	0.9776	48.400
70	271.60	23.6	280.0	26.0	10.27	0.9712	48.721
90	268.50	23.6	280.0	26.0	9.11	0.9583	49.995
90	268.50	23.6	280.0	26.0	9.13	0.9583	49.955
Average						0.9739	49.314

Remark :  
 $YI \leq \pm 0.02$  from average  
 $YI = 1.00 \pm 0.05$   
 $\Delta H@ \leq \pm 5.08$  mm H<sub>2</sub>O from average  
 $\Delta H@ = 46.7 \pm 6.4$  mm H<sub>2</sub>O

Checked By : Chaowalit S.  
(Chaowalit Sirinan)  
Senior Inspector  
Date : 14/8/2025

Approved By : Thepsan Y.  
(Thepsan Yommana)  
Technical Specialist Manager  
Date : 14/08/2025



### Temperature Display Verification

Dry Gas Meter ID. : ENSS 16113 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : PK

#### Temperature Simulator Information

Simulator Brand : Handy Cal Simulator S/N : T1L1015  
Simulator Model : CA11E Expire Date : 24-Jul-2026

Standard Value	Instrument Display			
	Stack	Probe	Filter	Aux
300	300	300	300	300
200	200	200	200	200
150	151	151	151	151
100	101	101	101	101
50	51	50	50	51
0	0	0	0	0
Difference	0.3%	1.0	1.0	1.0

Remark : Stack  $\leq \pm 1.5\%$  Absolute  
Probe  $\leq \pm 3.0^\circ\text{C}$   
Filter  $\leq \pm 3.0^\circ\text{C}$

Aux  $\leq \pm 3.0^\circ\text{C}$   
Exit  $\leq \pm 3.0^\circ\text{C}$

Checked By : Chawalit S. Approved By : Thepsan Y.  
(Chaowalit Srinan) (Thepsan Yommana)  
Position : Senior Inspector Position : Technical Specialist Manager  
Date : 14/8/2015 Date : 14/08/2015



### Meter Console Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : SY

#### Wet gas meter Information

Wet gas Brand : Shinagawa Wet gas S/N : 544122  
Wet gas Model : W-NK-2.5A Expire Date : 10-Jun-2027

Orifice Setting $\Delta H@$ (mm H <sub>2</sub> O)	Wet gas		Metering System		Time (min)	YI	$\Delta H@$
	V <sub>w</sub> (L)	T <sub>w</sub> (°C)	V <sub>d</sub> (L)	T <sub>m</sub> (°C)			
13	138.58	24.2	140.0	20.0	12.41	0.9748	52.359
13	137.78	24.0	140.0	20.5	12.39	0.9713	52.548
26	137.62	24.1	140.0	21.0	8.55	0.9704	52.334
26	137.56	24.1	140.0	21.5	8.55	0.9717	52.290
40	274.78	23.9	280.0	22.0	13.56	0.9713	49.163
40	273.70	23.7	280.0	22.5	13.54	0.9698	49.166
50	273.08	23.6	280.0	23.0	12.19	0.9687	48.389
50	272.54	23.6	280.0	23.0	12.19	0.9688	48.581
70	271.62	23.6	280.0	23.0	10.17	0.9615	47.841
70	270.80	23.6	280.0	23.5	10.17	0.9604	48.034
90	268.72	23.6	280.0	24.0	9.03	0.9528	48.588
90	267.78	23.6	280.0	25.0	9.02	0.9527	48.586
Average							49.823

Remark : YI  $\leq \pm 0.02$  from average  
YI =  $1.00 \pm 0.05$   
 $\Delta H@ \leq \pm 5.08$  mm H<sub>2</sub>O from average  
 $\Delta H@ = 46.7 \pm 6.4$  mm H<sub>2</sub>O

Checked By : Chawalit S. Approved By : Thepsan Y.  
(Chaowalit Srinan) (Thepsan Yommana)  
Position : Senior Inspector Position : Technical Specialist Manager  
Date : 14/8/2015 Date : 14/08/2015

## Temperature Display Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 14-Aug-2025  
Instrument Brand : Apex / Model 572 Calibrated By : PK

## Temperature Simulator Information

Simulator Brand : Handy Cal Simulator S/N : T1L1015  
Simulator Model : CA11E Expire Date : 24-Jul-2026

Standard Value	Instrument Display				
	Stack	Probe	Filter	Aux	Exit
300	301	301	301	301	-
200	201	201	201	201	-
150	152	152	152	152	-
100	102	101	101	102	-
50	50	50	50	51	50
0	0	0	0	0	0
Difference	0.5%	2.0	2.0	2.0	0.0

Remark : Stack  $\leq \pm 1.5\%$  Absolute  
Probe  $\leq \pm 3.0\text{ }^{\circ}\text{C}$   
Filter  $\leq \pm 3.0\text{ }^{\circ}\text{C}$

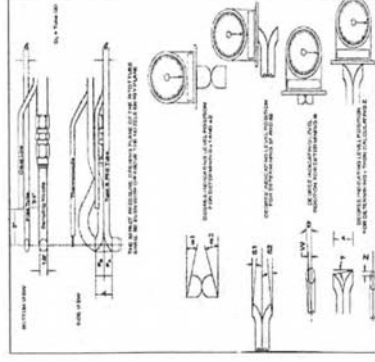
Aux  $\leq \pm 3.0\text{ }^{\circ}\text{C}$   
Exit  $\leq \pm 3.0\text{ }^{\circ}\text{C}$

Checked By : Chonwatt Srinan Approved By : Thapson Y.  
(Chonwatt Srinan) (Thapson Yommana)  
Position : Senior Inspector Position : Technical Specialist Manager  
Date : 14/8/2025 Date : 31/08/2025

## Certificate of Calibration

S-Type Geometric Pitot Tube Calibration

See the Code of Federal Regulations, Title 40, Part 60, Appendix A,  
Method 2, Item 4



Pitot tube/Probe No. No.59/A10404

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or Y	PASS
Ports Damaged?	N	No or n	PASS
$\alpha_1$	1.1	$-10^\circ < \alpha_1 < +10^\circ$	PASS
$\alpha_2$	-2.1	$-10^\circ < \alpha_1 < +10^\circ$	PASS
$\beta_1$	-1.2	$-5^\circ < \alpha_1 < +5^\circ$	PASS
$\beta_2$	-1.5	$-5^\circ < \alpha_1 < +5^\circ$	PASS
$\gamma$	-1.6	N/A	-
$\theta$	-1.9	N/A	-
$D_1$	0.375	$0.188'' \text{ to } 0.375''$	PASS
A	0.966142	$2.1D_1 \leq A \leq 3.0D_1$	PASS
A/2D <sub>1</sub>	1.288189	$1.05 \leq P_1/D_1 \leq 1.5$	PASS
Z = A tan $\gamma$	-0.02699	$Z \leq 0.125''$	PASS
W = A tan $\theta$	-0.03205	$W \leq 0.031''$	PASS

I certify that pitot tube/Probe  
and is hereby assigned a pitot tube certification factor of 0.84. See 40 CFR Pt. 60, App A, EPA Method 2

No.59/A10404 meets or exceeds all specifications, criteria and/or applicable design features

Standard Device  
Device Name Digital Inclinator  
Manufacturer BASELINE  
Model 12-1057  
ID No. QC-1824

Expiration date  
ENSS No. 12-Dec-25  
ENSS 22159

Certified by Neenden A.  
Date 4/10/2025

Approved by [Signature]  
Date 4/11/25





Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENSS 043  
Nozzle ID ENSS 091 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo		D <sub>avg</sub>
	D1	D2	D3	ΔD	ΔD	
1	3.12	3.16	3.10	0.06	0.06	3.13
2	4.42	4.42	4.42	0.00	0.00	4.42
3	5.12	5.12	5.10	0.02	0.02	5.11
4	6.20	6.20	6.22	0.02	0.02	6.21
5	9.02	9.10	9.10	0.08	0.08	9.07
6	9.30	9.36	9.32	0.06	0.06	9.33
7	12.52	12.58	12.50	0.08	0.08	12.53

Remark : ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm  
 $D_{avg} = (D1+D2+D3)/3$

Checked By : Chaowalit S. (Chaowalit Srianan) Supervisor 4/01/25  
Approved By : (Phatsakorn soonthornwiphat) CEMs Manager 4/1/25  
Position :  
Date :



Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENSS 043  
Nozzle ID ENSS 16111 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo		D <sub>avg</sub>
	D1	D2	D3	ΔD	ΔD	
1	3.10	3.10	3.08	0.02	0.02	3.09
2	4.48	4.48	4.48	0.00	0.00	4.48
3	5.64	5.70	5.64	0.06	0.06	5.66
4	6.12	6.10	6.08	0.04	0.04	6.10
5	9.16	9.20	9.20	0.04	0.04	9.19
6	10.86	10.80	10.80	0.06	0.06	10.82
7	12.50	12.52	12.48	0.04	0.04	12.50

Remark : ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm  
 $D_{avg} = (D1+D2+D3)/3$

Checked By : Chaowalit S. (Chaowalit Srianan) Supervisor 4/01/25  
Approved By : (Phatsakorn soonthornwiphat) CEMs Manager 4/1/25  
Position :  
Date :



Prob Nozzle Diameter Calibration Data Sheet

Date 04/01/2025 Personal CS  
Vernier (Digital) Dial Caliper Reference ENS5 043  
Nozzle ID ENS5 16112 Stainless Steel Expire Date 04/01/2026

Nozzle No.	Nozzle Diameter (mm)				HI-Lo	D <sub>avg</sub>
	D1	D2	D3	AD		
1	2.96	2.94	3.00	0.06	0.06	2.97
2	4.30	4.32	4.38	0.08	0.08	4.33
3	4.80	4.82	4.80	0.02	0.02	4.81
4	7.52	7.60	7.58	0.08	0.08	7.57
5	9.02	9.00	9.00	0.02	0.02	9.01
6	10.76	10.72	10.74	0.04	0.04	10.74
7	12.62	12.58	12.50	0.12	0.12	12.57

Remark : AD = Maximum distance between any two diameters, must be ≤ 0.100 mm  
D<sub>avg</sub> = (D1+D2+D3)/3

Checked By : chaowalit srinan Approved By : (Phatsakorn soonthornwiphat)  
Position : Supervisor CEMs Manager  
Date : 4/01/25 Date : 4/1/25



Certificate of Calibration

Equipment: Balance Certificate No.: C01243462  
Model: CPA225D Issued Date: 13 November 2024  
Serial No. (or ID.): 28812504 (B2014002) Job No.: WO-00047988  
Manufacturer: Sartorius Page: 1 of 5  
Condition: In condition

Customer: SGS (THAILAND) CO., LTD.  
1/209, 1/211 Moo 1, Tambol Banchang,  
Amphur Banchang, Rayong 21130 Thailand

Environment Condition: Temperature 21 °C ± 0.9 °C  
Humidity 72 %RH ± 1.6 %RH

Calibration Place: SGS (THAILAND) CO., LTD. ( Balance Lab )  
1/209, 1/211 Moo 1, Tambol Banchang,  
Amphur Banchang, Rayong 21130 Thailand

Calibration By: Mr. Thanathom Phunook  
Calibration Date: 07 November 2024  
In-house method, CAL-WI-47, based on UKAS Lab 14

The Method used: This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02240400

Thanathom Phunook  
(Mr. Thanathom Phunook)

Adisai Maknoi  
(Mr. Adisai Maknoi)

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

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/certificate-thailand

Delivering Growth - In Asia and Beyond.



Certificate No.: C01243462

Page: 2 of 5



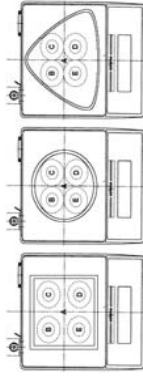
Certificate No.: C01243462

Page: 3 of 5

### Calibration Results:

#### Before Adjustment

**Eccentric Error:** Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.



Nominal Test Value		Reference Points (g)			
		A	B	C	D
-	0.0000	-0.0001	-0.0003	0.0000	0.0000

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.00001 (g)

Nominal test value (g)	Standard Deviation
5	0.000005
50	0.000005

**Error of Indication from nominal or conventional mass value.,** Readability 0.00001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
0.01	0.010001	0.01001	0.00001	0.000011	2.03
0.05	0.049998	0.05001	0.00001	0.000012	2.02
0.1	0.100003	0.10002	0.00002	0.000013	2.01
0.5	0.500003	0.50000	0.00000	0.000016	2.01
1	1.000014	1.00001	0.00000	0.000018	2.00
5	5.000016	5.00003	0.00001	0.000027	2.00
10	10.000013	10.00005	0.00004	0.000034	2.00
20	20.000011	20.00006	0.00005	0.000048	2.00
50	50.000028	50.00008	0.00005	0.000080	2.00
70	70.000039	70.00012	0.00008	0.00013	2.00
90	90.000048	90.00013	0.00008	0.00016	2.00

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Prachinburi 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/identification

Delivering Growth - In Asia and Beyond.

CAL-FM-C01-14: 12 Sep 2022

#### Before Adjustment (Cont.)

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
110	0.00005
200	0.00005

**Error of Indication from nominal or conventional mass value.,** Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
105	104.99998	105.0002	0.0002	0.00019	2.00
110	109.99997	110.0002	0.0002	0.00019	2.00
120	119.99997	120.0003	0.0003	0.00021	2.00
130	129.99998	130.0003	0.0003	0.00023	2.00
140	139.99998	140.0003	0.0003	0.00024	2.00
150	149.99999	150.0004	0.0004	0.00023	2.00
160	160.00000	160.0004	0.0004	0.00027	2.00
170	170.00000	170.0002	0.0002	0.00027	2.00
180	180.00001	180.0002	0.0002	0.00030	2.00
190	190.00001	190.0002	0.0002	0.00031	2.00
200	199.99996	200.0003	0.0003	0.00029	2.00

DKSH Technology Limited  
2533 Sukhumvit Road, Bangkok, Prachinburi 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/identification

Delivering Growth - In Asia and Beyond.

CAL-FM-C01-14: 12 Sep 2022



Certificate No.: C01243462

Page: 4 of 5

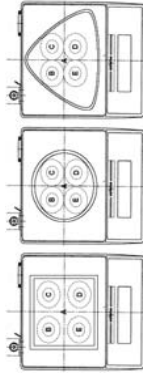


Certificate No.: C01243462

Page: 5 of 5

#### After Adjustment

**Eccentric Error:** Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.



Nominal Test Value		Reference Points (g)			
		A	B	C	D
-		0.0000	-0.0001	-0.0003	0.0000

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.00001 (g)

Nominal test value (g)	Standard Deviation
5	0.000005
50	0.000005

**Error of Indication from nominal or conventional mass value.,** Readability 0.00001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
0.01	0.010001	0.01000	0.00000	0.000011	2.03
0.05	0.049998	0.05000	0.00000	0.000012	2.02
0.1	0.100003	0.09998	-0.00002	0.000013	2.01
0.5	0.500003	0.49998	-0.00002	0.000016	2.01
1	1.000014	1.00001	0.00000	0.000018	2.00
5	5.000016	5.00001	-0.00001	0.000027	2.00
10	10.000013	10.00000	-0.00001	0.000034	2.00
20	20.000011	20.00001	0.00000	0.000048	2.00
50	50.000028	50.00002	-0.00001	0.000080	2.00
70	70.000039	70.00003	-0.00001	0.00013	2.00
90	90.000048	90.00003	-0.00002	0.00016	2.00

บริษัท ดีเคเอส อีเซีย จำกัด  
DKSH Technology Limited  
2533 สุขุมวิท ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10260  
2533 Sukhumvit Road, Bangkok, Prachinang, Bangkok 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/certificate-thailand

Delivering Growth - In Asia and Beyond.

CAL-FM-C01-14: 12 Sep 2022

#### After Adjustment (Cont.)

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
110	0.00005
200	0.00004

**Error of Indication from nominal or conventional mass value.,** Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
105	104.99998	105.0000	0.0000	0.00019	2.00
110	109.99997	110.0000	0.0000	0.00019	2.00
120	119.99997	120.0000	0.0000	0.00021	2.00
130	129.99998	130.0000	0.0000	0.00023	2.00
140	139.99998	140.0000	0.0000	0.00024	2.00
150	149.99999	150.0000	0.0000	0.00023	2.00
160	160.00000	160.0000	0.0000	0.00027	2.00
170	170.00000	170.0000	0.0000	0.00027	2.00
180	180.00001	180.0000	0.0000	0.00030	2.00
190	190.00001	190.0000	0.0000	0.00031	2.00
200	199.99996	200.0000	0.0000	0.00029	2.00

The End of Certificate

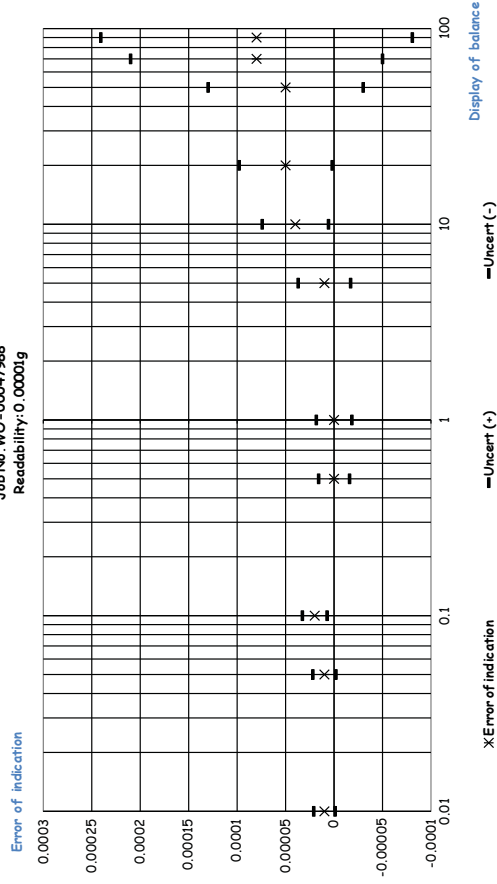
บริษัท ดีเคเอส อีเซีย จำกัด  
DKSH Technology Limited  
2533 สุขุมวิท ถนนสุขุมวิท แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10260  
2533 Sukhumvit Road, Bangkok, Prachinang, Bangkok 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/certificate-thailand

Delivering Growth - In Asia and Beyond.

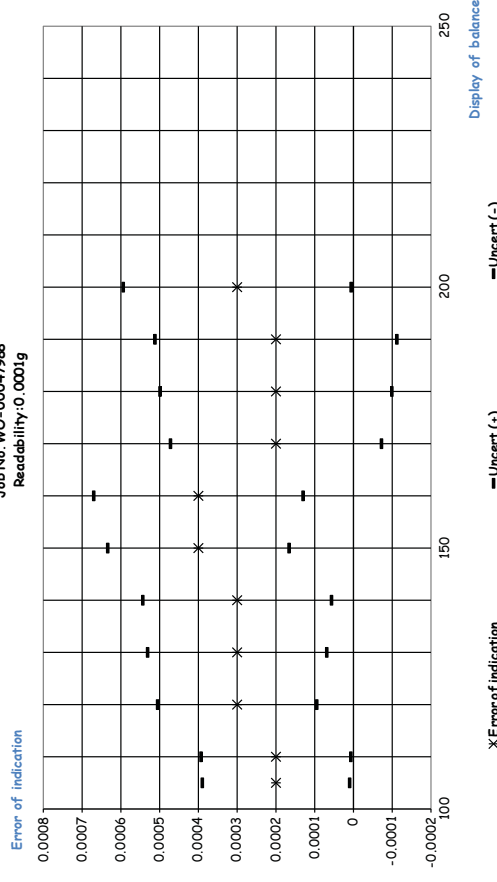
CAL-FM-C01-14: 12 Sep 2022



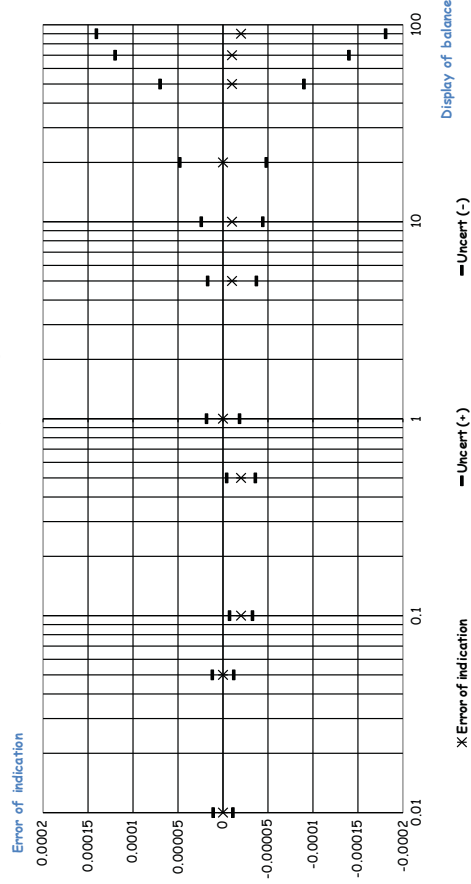
Before Adjustment  
Job No. WO-00047988  
Readability: 0.00001g



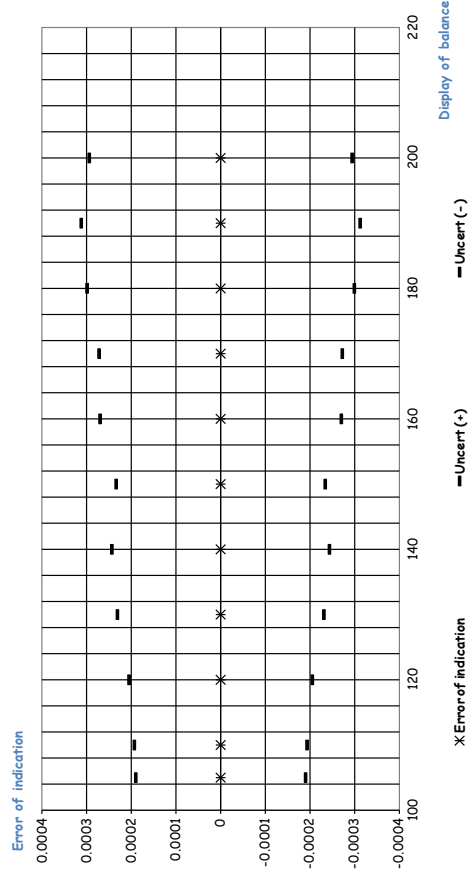
Before Adjustment  
Job No. WO-00047988  
Readability: 0.0001g



After Adjust  
Job No. WO-00047988  
Readability: 0.00001g



— Uncert (-)  
— Uncert (+)





ใบตรวจสอบสภาพเครื่องชั่ง

ชนิดเครื่องมือ: Balance      รุ่น: CPA225D      เลขที่ใบงาน: WO-00047988      หมายเลขเครื่อง: 28812504

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
07 Nov 2024			07 Nov 2024		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		<b>General</b>			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. สายไฟ/Adapter, power supply 220V/110V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสมบูรณ์ชุดกระจกกันลม (Cover)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. ความสมบูรณ์ชุดของระดับน้ำ	<input type="checkbox"/>	<input checked="" type="checkbox"/>	เสื่อมสภาพ
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. การปรับระดับของขาตั้งเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. การตอบสนองของปุ่มกด	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. ความสมบูรณ์ของ Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. การแสดงผลของ Display หลังวางน้ำหนัก	<input type="checkbox"/>	<input checked="" type="checkbox"/>	**
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. ชุดรองจานชั่ง (Stopper) / pan support	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. การทำงานของ Function Internal / External	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. ความสะอาดของตัวเครื่องภายนอกและแกน load cell	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. สภาพแวดล้อม ณ สถานที่ตั้งเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

หมายเหตุเพิ่มเติม/ข้อแนะนำ: \*\* การแสดงผลของ Display หลังวางน้ำหนัก : มีค่าน้ำหนักติดไม่รีเซ็ตจำนวนที่ 3  
แล้วค่าน้ำหนักถึงจะค่อยลดลง ไปได้ก็ใกล้เคียงกับค่าชั่งน้ำหนักที่ใช้วาง Test

Mr. Thanathorn Phunook  
Service Engineer

บริษัท ดีเคเอส เอเซีย จำกัด  
DKSH Technology Limited  
2533 ถนนสุขุมวิท แขวงจตุจักร เขตจตุจักร กรุงเทพมหานคร 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/identify-thailand

Delivering Growth - in Asia and Beyond.



CALIBRATION CERTIFICATE

Date of Issue: Mar 26, 2025      Cert No.: 25/1243      Order No.: 25030172

Customer: SGS (Thailand) Limited.  
1209, 1/211 Moo 1, T. Ban Chang, A. Ban Chang Rayong 21130 Thailand.

Place of Calibration: Hot Lab

Description: Oven  
Model: UFE400  
Serial No.: G410.0833  
ID.No.: O2010002

Date of Receipt: Mar 24, 2025  
Date of Calibration: Mar 24, 2025  
Environment:

Temperature: (Min) 28.4 °C (Max) 29.6 °C  
Relative Humidity: (Min) 37.3 %rh (Max) 44.9 %rh

Calibration Method

WI-17: The reference thermometer was placed into the chamber and measurement was performed based on AS-2853.  
The temperature scale in use at this laboratory is the International Temperature Scale of 1990.

Standard Equipment: 1) Data Acquisition Switch Unit with Sensor  
Serial No.: MY59003190  
Certificate No.: QR24-1215  
Due Date: 07 Jun 2025

This certificate is traceable to SI unit.

This certificate is issued in accordance with the conditions of accreditation granted by Thermology Laboratory Room. The traceability to recognised national standard and the unit of measurement realised at corresponding national standard Laboratory Room. This certificate may not be reproduced other than in full except with the prior written approval of Laboratory Room.



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaithong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue

Mar 26, 2025

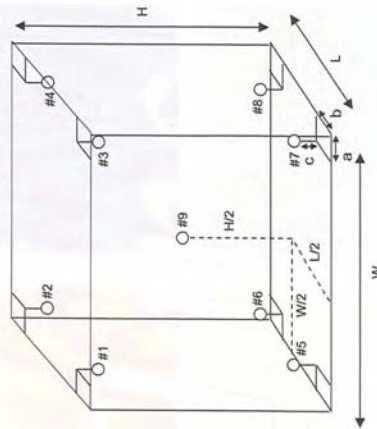
Cert No.

25/1243

Order No.

25030172

Results (without adjustment)



Position of reference thermometers were placed

### Note.

- 1). Dimension (W x L x H) is 40 x 33 x 40 cm
- 2). Stability - greatest one half of difference between max peak and min peak of each reference probe measured temperature obtained during the calibration interval.
- 3). 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. The reference sensor should preferably be located at the geometric center of the chamber.

*Handwritten signature*



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaithong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue

Mar 26, 2025

Cert No.

25/1243

Order No.

25030172

Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability ±(°C)	Uniformity (°C)	Uncertainty ±(°C)
85.0	85.0	85.0	Position 1 85.191	0.050	0.353	0.31
			Position 2 85.077			
			Position 3 84.608			
			Position 4 84.979			
			Position 5 85.009			
			Position 6 85.183			
			Position 7 84.615			
			Position 8 84.798			
			Position 9 84.871			

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability ±(°C)	Uniformity (°C)	Uncertainty ±(°C)
104.0	104.0	104.0	Position 1 104.353	0.125	0.447	0.44
			Position 2 104.196			
			Position 3 103.636			
			Position 4 104.066			
			Position 5 104.094			
			Position 6 104.349			
			Position 7 103.575			
			Position 8 103.834			
			Position 9 103.934			

*Handwritten signature*



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue Mar 26, 2025 Cert No. 25/1243  
Order No. 25030172

### Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability + (°C) - (°C)	Uniformity (°C)	Uncertainty + (°C) - (°C)
150.0	150.0	150.0	Position 1	0.124	0.782	0.47
			Position 2			
			Position 3			
			Position 4			
			Position 5			
			Position 6			
			Position 7			
			Position 8			
			Position 9			

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability + (°C) - (°C)	Uniformity (°C)	Uncertainty + (°C) - (°C)
180.0	180.0	180.0	Position 1	0.073	1.010	0.48
			Position 2			
			Position 3			
			Position 4			
			Position 5			
			Position 6			
			Position 7			
			Position 8			
			Position 9			

*[Signature]*



**Thermology Co., Ltd.**

96/177-96/178 Moo 6, T. La-harn, A. Bangbuaathong, Nonthaburi 11110  
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co



## CALIBRATION CERTIFICATE

Date of Issue Mar 26, 2025 Cert No. 25/1243  
Order No. 25030172

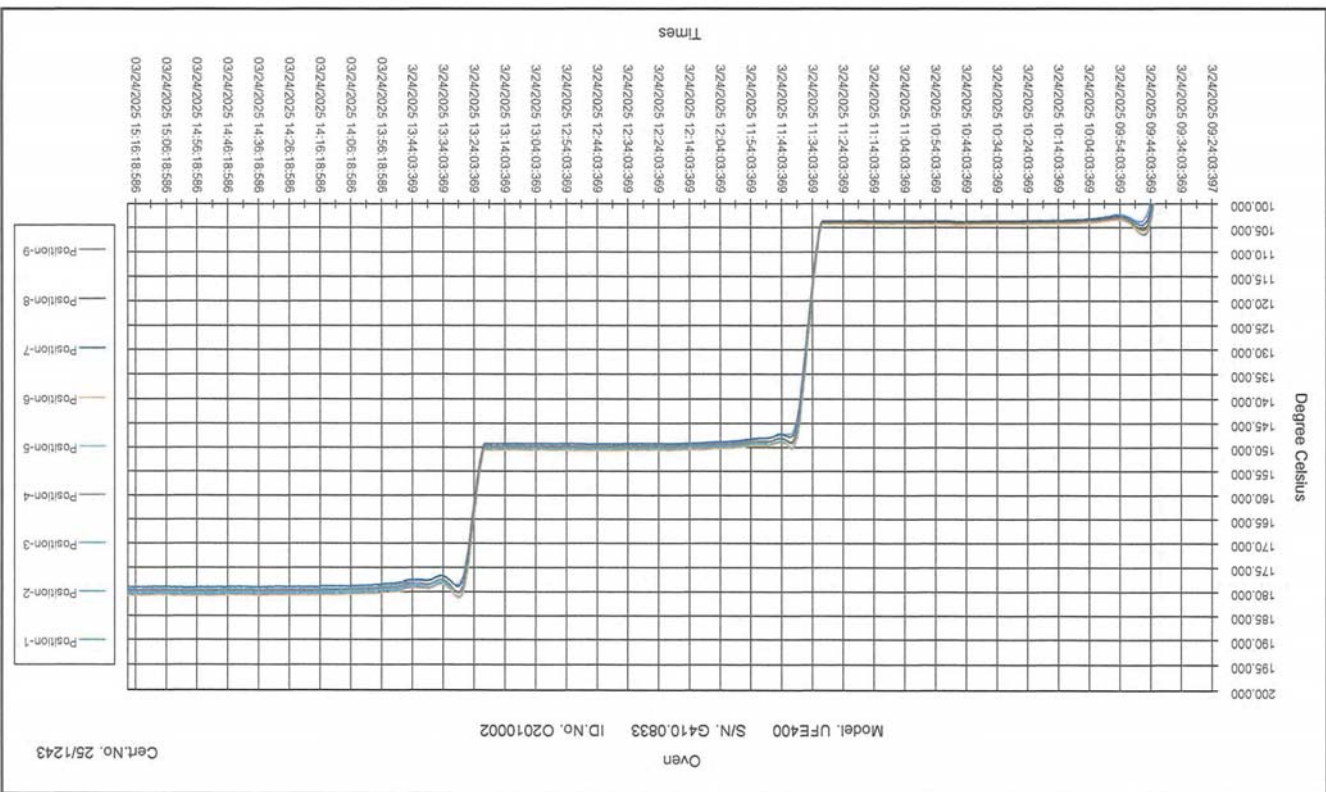
The stability and uniformity were taken into account in the measurement uncertainty stated.  
The above results are valid exclusively for calibration samples as mentioned in this report.  
This reported expanded uncertainty was based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with ONAC requirements.

### APPROVED SIGNATORY :

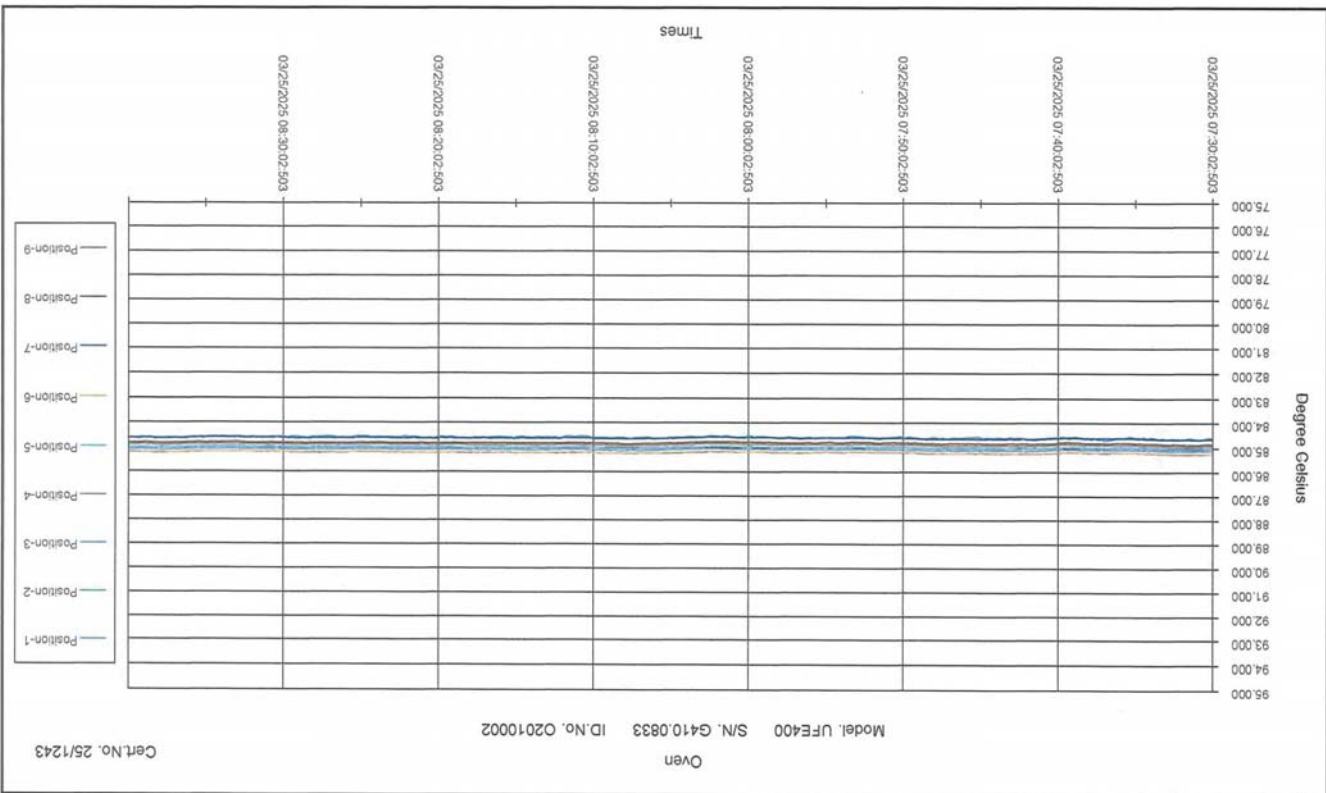
☐ MR. PRAJUCKPETCH THONGSOOKCHOTE  
☐ MR. DAMRONG MULSING  
☒ MR. JATURAPAT THONGSOOKCHOTE



Handwritten signature



Handwritten signature





บริษัท เพทโร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### 1Single-Point Gas Test Report

Equipment :	All Gas Analyzer	Customer Name :	SGS (Thailand) Limited
Manufacturer :	ABB, Thermo Electron	Contact Name :	Khun Phasakorn Soonthornwiphat

#### Standard gas Information

Cylinder Number : ND27163	Expiration Date: Jan 25, 2030
Sulfur Dioxide (SO <sub>2</sub> ) = 90.82 ppm	Balance Nitrogen
Cylinder Number : ND27163	Expiration Date: Jan 25, 2030
Carbon Monoxide (CO) = 89.58 ppm	Balance Nitrogen
Cylinder Number : ND27163	Expiration Date: Jan 25, 2030
Nitrogen Oxide (NO) = 91.06 ppm	Balance Nitrogen
Cylinder Number : GN0018529	Expiration Date: Feb 14, 2027
Carbon Dioxide (CO <sub>2</sub> ) = 20.95 %	Balance Nitrogen
Cylinder Number : 4621265Y	Expiration Date: Nov 27, 2031
Oxygen (O <sub>2</sub> ) = 20.90 %	Balance Nitrogen

#### VALIDATION RESULT TABLE

Parameter	ZERO			SPAN			Resultant Conclusion
	Ideal	Actual	Error	Ideal	Actual	%Error	
NO	0.00	0.639	0.64	91.06	118.00	29.58	Not passed
NO <sub>x</sub>	0.00	0.662	0.66	91.26	119.00	30.40	Not passed
SO <sub>2</sub>	0.00	1.5	1.48	90.82	104.00	14.51	Not passed
CO	0.00	2.650	2.65	89.58	79.20	-11.59	Not passed
CO <sub>2</sub>	0.00	-0.068	-0.09	20.95	18.35	-12.41	Not passed
O <sub>2</sub>	0.00	-0.04	-0.04	20.90	21.00	0.10	Passed

#### CALIBRATION RESULT TABLE

Parameter	ZERO			SPAN			Resultant Conclusion
	Ideal	Actual	Error	Ideal	Actual	%Error	
NO	0.00	0.001	0.00	91.06	91.10	0.04	Passed
NO <sub>x</sub>	0.00	0.001	0.00	91.26	91.30	0.04	Passed
SO <sub>2</sub>	0.00	0.000	0.00	90.82	90.82	0.00	Passed
CO	0.00	0.001	0.00	89.58	89.60	0.02	Passed
CO <sub>2</sub>	0.00	0.001	0.00	20.95	20.95	0.00	Passed
O <sub>2</sub>	0.00	0.00	0.00	20.90	20.90	0.00	Passed

Remark: Percent Error of each Parameter must be less than ± 5 % of reading.

Note :	Perform calibration to all analyzer and the result is in the control limits
--------	---

DONE BY: Mr. Phuananai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 1 OF 10

PM-SGS CEI's MOBILE#03-2025



บริษัท เพทโร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	NO-NO <sub>2</sub> -NO <sub>x</sub> Analyzer (NO <sub>x</sub> )	Manufacturer :	Thermo Fisher Scientific
Model :	42iHL-BZSSDCA	Serial Number:	1152640007

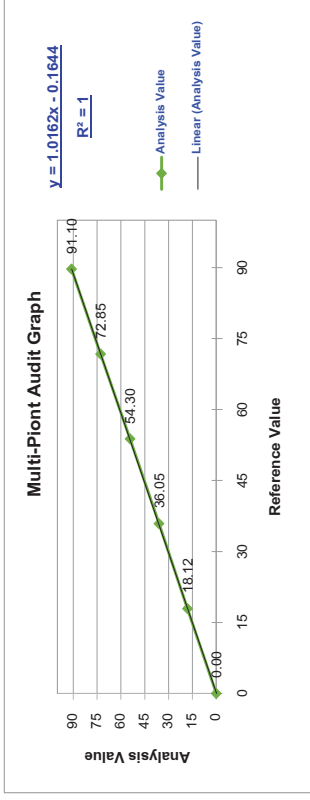
#### Standard gas Information

Cylinder Number : ND27163	Expiration Date: Jan 25, 2030
Nitric Oxide (NO <sub>x</sub> ) = 91.26 ppm	Balance Nitrogen
Zero air used Nitrogen 99.999%	

#### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
Level	ppm	#1	#2			
#1	Zero	0.00	0.01	0.00	0.00	0.00
#2	20%	17.94	18.20	18.12	1.00	1.00
#3	40%	35.87	36.10	36.05	0.18	0.50
#4	60%	53.81	54.20	54.40	0.49	0.91
#5	80%	71.74	72.90	72.85	1.11	1.54
#6	100%	89.68	91.10	91.10	1.42	1.58
Measuring Range		100 ppm		Average Difference (%)		0.92

Correlation Coefficient	1.0000	Slope	1.0162	Intercept	-0.1644
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuananai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 2 OF 10

PM-SGS CEI's MOBILE#03-2025



บริษัท เพทโร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chauchak , Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	NO-NO <sub>x</sub> -NO <sub>x</sub> Analyzer (NO)	Manufacturer :	Thermo Fisher Scientific
Model :	42iHL-BZSSDCA	Serial Number:	1152640007

#### Standard gas Information

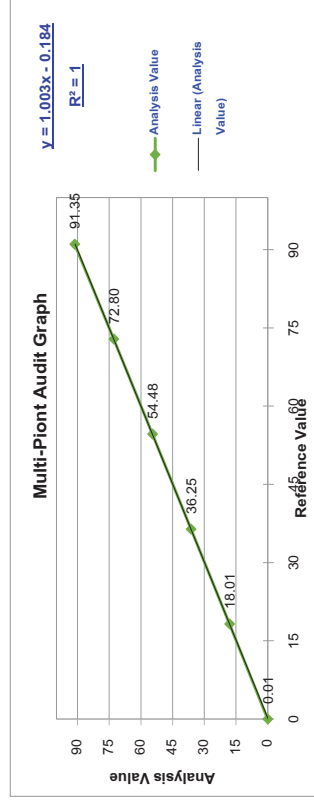
Cylinder Number : ND27163  
Nitric Oxide (NO) = 91.06 ppm  
Balance Nitrogen

Zero air used Nitrogen 99.999%

#### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
Level	ppm	#1	#2	Avg.		
#1	Zero	0.00	0.01	0.01	0.01	0.01
#2	20%	18.21	18.02	18.00	-0.20	-1.11
#3	40%	36.42	36.20	36.30	-0.17	-0.48
#4	60%	54.64	54.60	54.35	-0.16	-0.29
#5	80%	72.85	73.20	72.80	-0.05	-0.07
#6	100%	91.06	91.30	91.35	0.29	0.32
Measuring Range		100 ppm		Average Difference (%)		0.38

Correlation Coefficient	1.0000	Slope	1.0030	Intercept	-0.1840
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 3 OF 10

PM-SGS CEMS MOBILE#3-2025



บริษัท เพทโร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak , Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	SO <sub>2</sub> Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	43iHL-DZCA	Serial Number:	12403232473

#### Standard gas Information

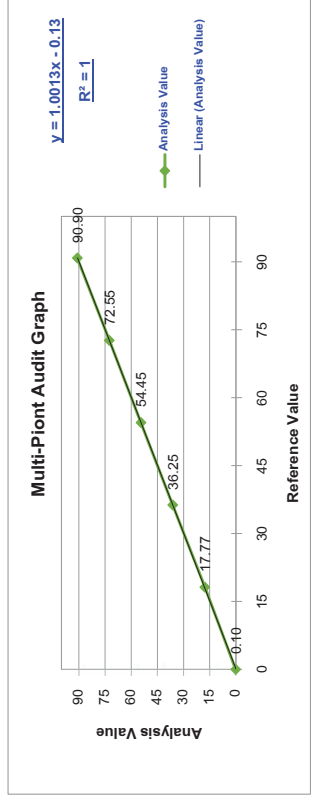
Cylinder Number : ND27163  
Sulfur Dioxide (SO<sub>2</sub>) = 90.82 ppm  
Balance Nitrogen

Zero air used Nitrogen 99.999%

#### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
Level	ppm	#1	#2	Avg.		
#1	Zero	0.00	0.1	0.1	0.10	0.10
#2	20%	18.16	17.8	17.77	-0.39	-2.17
#3	40%	36.33	36.3	36.25	-0.08	-0.21
#4	60%	54.49	54.1	54.45	-0.04	-0.08
#5	80%	72.66	72.4	72.7	-0.11	-0.15
#6	100%	90.82	90.9	90.90	0.08	0.09
Measuring Range		100 ppm		Average Difference (%)		0.47

Correlation Coefficient	1.0000	Slope	1.0013	Intercept	-0.1300
-------------------------	--------	-------	--------	-----------	---------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 4 OF 10

PM-SGS CEMS MOBILE#3-2025



บริษัท เพทโทร-อินสตรูเมนต์ จำกัด

**PETRO-INSTRUMENTS CORP., LTD.**

71/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines), 513 2333 (12 Lines), 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

## Calibration Report

## Multi-Point Gas Test Report

<b>Equipment :</b>	CO <sub>2</sub> Analyzer	<b>Manufacturer :</b>	Thermo Fisher Scientific
<b>Model :</b>	4101-BZPECA	<b>Serial Number:</b>	1170530050

### Standard gas Information

**Cylinder Number : GN0018529**  
Carbon Dioxide (CO<sub>2</sub>) = 20.95 %

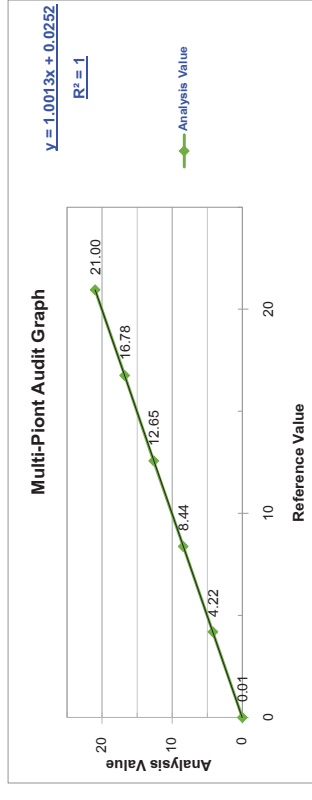
Zero air used Nitrogen 99.999%

### Multi-Point Gas Test Data

Reference gas value		Analyzer Display Value		Error (ppm)	% Error	%ABS (Std. $\pm 5\%$ )
Level	%	#1	#2			
#1	Zero	0.00	0.01	0.01	0.01	0.01
#2	20%	4.19	4.21	4.22	0.02	0.60
#3	40%	8.38	8.42	8.44	0.05	0.66
#4	60%	12.57	12.60	12.70	0.08	0.64
#5	80%	16.76	16.70	16.85	0.01	0.09
#6	100%	20.95	21.00	21.00	0.05	0.24
Measuring Range		25 %		Average Difference (%)		0.37

Average Difference (%)

Correlation Coefficient	1.0000	Slope	1.0013	Intercept	0.0252
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

☒ Passed ☐ Not Passed

**DONE BY: Mr. Phuwantai Nakakul**

DATE: 7-16 January 2025

## CALIBRATION REPORT

PM-SGS CEMs MOBILE#03-2025





บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

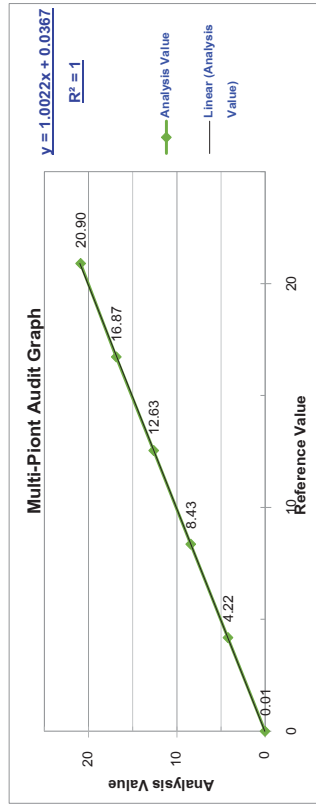
### Calibration Report

Multi-Point Gas Test Report			
Equipment :	O <sub>2</sub> Analyzer	Manufacturer :	ABB
Model :	AO 2020	Serial Number:	3.269410.5
Standard gas Information			
Cylinder Number : 4621265 Y			
Oxygen (O <sub>2</sub> ) = 20.90 %			
Expiration Date: Nov 27, 2031			
Balance Nitrogen			

#### Multi-Point Gas Test Data

Reference gas value Level	%	Analyzer Display Value		Error (ppm)	% Error	%ABS (Std.<±5%)
		#1	#2			
#1	Zero	0.01	0.01	0.01	0.01	0.01
#2	20%	4.18	4.21	0.04	0.84	0.84
#3	40%	8.36	8.42	0.07	0.84	0.84
#4	60%	12.54	12.61	0.09	0.72	0.72
#5	80%	16.72	16.84	0.15	0.90	0.90
#6	100%	20.90	20.90	0.00	0.00	0.00
Measuring Range		25 %		Average Difference (%)		0.55

Correlation Coefficient	1.0000	Slope	1.0022	Intercept	0.0367
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than ± 5 % of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 7 OF 10

PM-SGS CEI Ms MOBILE#03-2025



บริษัท เพโทร-อินสตรูเมนต์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

Calibration Drift, LDL and Time Gas Response Test Report			
ANALYZER TESTED LIST			
ANALYZER NAME	BRAND	MODEL	SERIAL NUMBER
CO ANALYZER	THERMO ELECTRON	48I-BZSCA	1152640010
CO <sub>2</sub> ANALYZER	THERMO ELECTRON	410I-BZPECA	1170530050
O <sub>2</sub> ANALYZER	ABB	AO2020	3.269410.5
NO <sub>x</sub> ANALYZER	THERMO ELECTRON	42HL-BZSSDCA	1152640007
SO <sub>2</sub> ANALYZER	THERMO ELECTRON	43HL-DZCA	12403232473

#### CALIBRATION DRIFT TESTING REPORT

Parameters	Zero			Span			Judgement
	14-Jan-25	15-Jan-25	%DRIFT	14-Jan-25	15-Jan-25	%DRIFT	
CO	0.289	0.291	0.00	89.60	89.70	0.02	PASSED
CO <sub>2</sub>	0.030	0.033	0.01	21.00	21.00	0.00	PASSED
O <sub>2</sub>	0.020	0.030	0.04	20.90	20.90	0.00	PASSED
NO	0.009	0.012	0.00	90.10	90.10	0.00	PASSED
NO <sub>x</sub>	0.019	0.023	0.00	91.30	91.30	0.00	PASSED
SO <sub>2</sub>	0.310	0.280	-0.01	90.81	90.83	0.00	PASSED

#### LOWER DETECTABLE LIMIT TESTING REPORT

Parameters	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	STDEV.
CO	0.266	0.274	0.277	0.280	0.269	0.256	0.248	0.250	0.249	0.261	0.012
CO <sub>2</sub>	0.017	0.014	0.010	0.016	0.018	0.011	0.018	0.019	0.019	0.014	0.003
O <sub>2</sub>	-0.058	-0.072	-0.079	-0.089	-0.096	-0.102	-0.103	-0.105	-0.107	-0.111	0.017
NO	0.009	0.008	0.006	0.006	0.006	0.008	0.009	0.005	0.005	0.006	0.002
NO <sub>x</sub>	0.013	0.015	0.014	0.012	0.012	0.013	0.015	0.015	0.013	0.010	0.002
SO <sub>2</sub>	0.276	0.293	0.285	0.286	0.265	0.289	0.258	0.238	0.261	0.259	0.018

#### CONCLUSION

CO Lower detectable limit (LDL) value is 0.012 PPM  
CO<sub>2</sub> Lower detectable limit (LDL) value is 0.003 %  
O<sub>2</sub> Lower detectable limit (LDL) value is 0.017 %VOL.  
NO Lower detectable limit (LDL) value is 0.002 PPM  
NO<sub>x</sub> Lower detectable limit (LDL) value is 0.002 PPM  
SO<sub>2</sub> Lower detectable limit (LDL) value is 0.018 PPM

#### GAS RESPONSE TIME TESTING REPORT

CO Response time	12	<20	Sec
CO <sub>2</sub> Response time	12	<20	Sec
O <sub>2</sub> Response time	8	<20	Sec
NO <sub>x</sub> Response time	15	<20	Sec
SO <sub>2</sub> Response time	15	<20	Sec
With Sampling Line 80 meter			
	60	<120	Sec

DONE BY: Mr. Phuwanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 8 OF 10

PM-SGS CEI Ms MOBILE#03-2025



บริษัท เพทโร-อินструเม้นท์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### VALIDATION RESULT TABLE

Parameter	ZERO			SPAN		Resultant Conclusion
	Ideal	Actual	Error	Ideal	%Error	
CO	0.00	0.294	0.29	905.9	-16.33	Not passed

#### CALIBRATION RESULT TABLE

Parameter	ZERO			SPAN		Resultant Conclusion
	Ideal	Actual	Error	Ideal	%Error	
CO	0.00	0.017	0.02	905.9	0.01	Passed

Remark: Percent Error of each Parameter must be less than  $\pm 5\%$  of reading.



บริษัท เพทโร-อินструเม้นท์ จำกัด  
PETRO-INSTRUMENTS CORP., LTD.  
7/409 Soi Vibhavadi-Rangsit 36 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand  
TEL: (662) 939 5711 (12 Lines) 513 2333 (12 Lines) 513 9575-9 FAX: (662) 513 3730, 939 4208  
http : // [www.pico.co.th](http://www.pico.co.th) E-mail-address : [Combustion@pico.co.th](mailto:Combustion@pico.co.th)

### Calibration Report

#### Multi-Point Gas Test Report

Equipment :	CO Analyzer	Manufacturer :	Thermo Fisher Scientific
Model :	48I-BZSCA	Serial Number:	1152640010

#### Standard gas Information

Cylinder Number : ND57460	Expiration Date: Jul 20, 2029
Carbon Monoxide (CO) = 905.9 ppm	
Balance Nitrogen	

Zero air used Nitrogen 99.999%

#### Multi-Point Gas Test Data

Reference gas value Level	ppm	Analyzer Display Value			Error (ppm)	% Error	%ABS (Std.<±5%)
		#1	#2	Avg.			
#1	Zero	0.0	0.1	0.1	0.10	0.10	0.10
#2	20%	181.2	182.8	182.9	1.67	0.92	0.92
#3	40%	362.4	363.0	363.2	0.74	0.20	0.20
#4	60%	543.5	542.5	542.9	-0.84	-0.15	0.15
#5	80%	724.7	723.0	723.5	-1.22	-0.17	0.17
#6	100%	905.9	906.0	906.0	0.10	0.01	0.01
Measuring Range		1,000 ppm			Average Difference (%)		0.26

Correlation Coefficient	1.0000	Slope	0.9984	Intercept	0.8238
-------------------------	--------	-------	--------	-----------	--------



Remark: Percent error of each level gas must be less than  $\pm 5\%$  of reading.

Multi-Point gas test result ☒ Passed ☐ Not Passed

DONE BY: Mr. Phuvanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 9 OF 10

PM-SGS CEMs NOBLE#03-2025

DONE BY: Mr. Phuvanai Nakakul

DATE: 7-16 January 2025

CALIBRATION REPORT

PAGE 10 OF 10

PM-SGS CEMs NOBLE#03-2025



HORIBA (THAILAND) LIMITED

405 Rungtornjit Road, 1st, 2nd Fl., Ratchadapisek Rd., Huai Khwang, Bangkok 10310 THAILAND  
Telephone: +66 (0) 2661 5995, +66 (0) 2734-4434 Fax: +66 (0) 2661 5200  
Website: http://www.horiba.com

MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE

Equipment Information

Manufacturer  
Model  
Serial Number

Horiba  
HORIBA PG-350  
V40KVOLD

Calibration Date  
Background Coefficient  
Room Temperature

21-Nov-24  
0  
23.3 °C

Standard Gas Information

Zero Gas  
Cylinder Number  
Component  
Concentration  
Expiration Date

Span Gas  
17K686056  
N2  
99.999 %  
-  
28-Sep-30

Measurement Range

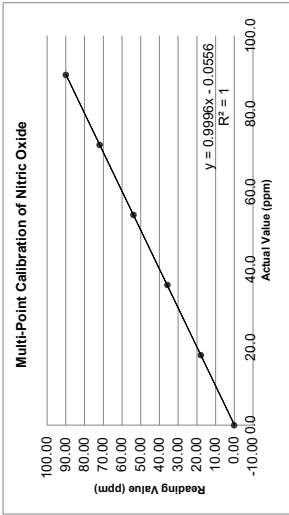
100  
89.94

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.1	0.1	0.10	0.10	
20%	17.99	17.80	18.00	17.90	-0.09	0.49
40%	35.98	36.00	35.50	35.73	-0.24	0.67
60%	53.96	54.10	53.50	53.80	-0.16	0.30
80%	71.95	71.70	72.00	71.90	-0.09	0.12
100%	89.94	89.80	90.00	90.10	0.03	0.32
Average					0.03	PASS

Slope	0.9996	Interception	-0.0556	Correlation Coefficient	1.0000
%Slope	-0.0445%	% Interception	-0.0556%	% Correlation Coefficient	-0.0007%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart



Test By: Preedant

Approve By: Nakao Gani

Date: 2-Dec-24

Date: 2-Dec-24



HORIBA (THAILAND) LIMITED

405 Rungtornjit Road, 1st, 2nd Fl., Ratchadapisek Rd., Huai Khwang, Bangkok 10310 THAILAND  
Telephone: +66 (0) 2661 5995, +66 (0) 2734-4434 Fax: +66 (0) 2661 5200  
Website: http://www.horiba.com

MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE

Equipment Information

Manufacturer  
Model  
Serial Number

Horiba  
HORIBA PG-350  
V40KVOLD

Calibration Date  
Background Coefficient  
Room Temperature

21-Nov-24  
1  
1.2894 °C

Standard Gas Information

Zero Gas  
Cylinder Number  
Component  
Concentration  
Expiration Date

Span Gas  
17K686056  
N2  
99.999 %  
-  
28-Sep-30

Measurement Range

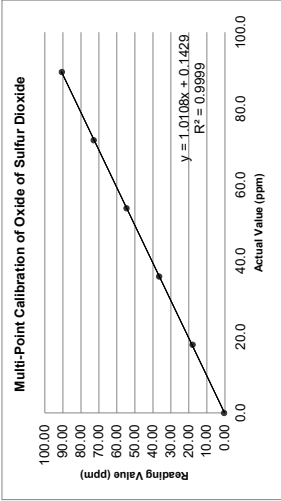
200  
44.79

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.4	0.2	0.4	0.33	
20%	17.92	18.20	17.60	17.80	-0.05	0.28
40%	35.83	37.00	36.20	36.10	0.43	1.68
60%	53.75	54.30	54.80	54.50	0.79	1.46
80%	71.66	72.80	73.10	72.60	1.17	1.63
100%	89.58	90.20	90.60	90.70	0.92	1.03
Average					0.92	PASS

Slope	1.0108	Interception	0.1429	Correlation Coefficient	1.0000
%Slope	1.0802%	% Interception	0.0714%	% Correlation Coefficient	-0.0026%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart



Test By: Preedant

Approve By: Nakao Gani

Date: 2-Dec-24

Date: 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE**

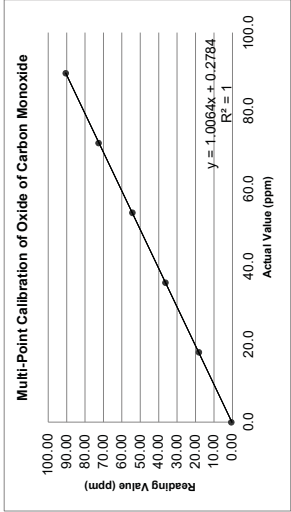
Equipment Information				21-Nov-24
Manufacturer	Horiba	Calibration Date		
Model	HORIBA PG-350	Background Coefficient	0	
Serial Number	V40KVOLD	Room Temperature	23.3 °C	
Standard Gas Information				
Zero Gas		Span Gas	ND58962	
Cylinder Number	17K686056	Cylinder Number	CO	
Component	N2	Component	89.58 ppm	
Concentration	99.999 %	Concentration	28-Sep-30	
Expiration Date	-	Expiration Date		
Measurement Range			200	
% Measurement Range			44.79	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.5	0.6	0.4	0.50	
20%	17.92	18.00	18.10	18.20	18.10	1.03
40%	35.83	36.20	36.40	36.32	36.31	1.32
60%	53.75	54.20	54.11	54.34	54.22	0.47
80%	71.66	72.42	72.34	72.90	72.55	0.89
100%	89.58	90.10	90.80	90.50	90.47	0.89
Average					1.09	
Result					PASS	

Slope	1.0064	Interception	0.2784	Correlation Coefficient	1.0000
%Slope	0.6448%	% Interception	0.1392%	% Correlation Coefficient	-0.0012%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preetchart Approve By Nakao Bani  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE**

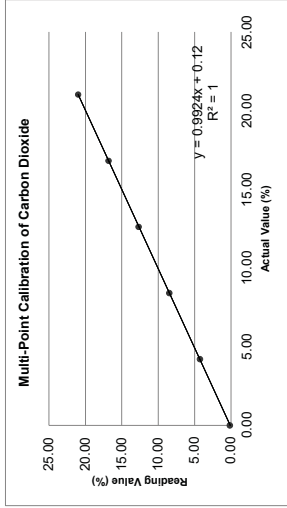
Equipment Information				21-Nov-24
Manufacturer	Horiba	Calibration Date		
Model	HORIBA PG-350	Background Coefficient	1	
Serial Number	V40KVOLD	Room Temperature	23.3 °C	
Standard Gas Information				
Zero Gas		Span Gas	ND11246	
Cylinder Number	17K686056	Cylinder Number	CO2	
Component	N2	Component	21.02 %	
Concentration	99.999 %	Concentration	8-Aug-30	
Expiration Date	-	Expiration Date		
Measurement Range			30	
% Measurement Range			70.07	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.12	0.14	0.16	0.14	0.14
20%	4.20	4.21	4.32	4.23	4.25	0.05
40%	8.41	8.44	8.46	8.48	8.46	0.05
60%	12.61	12.70	12.67	12.65	12.67	0.06
80%	16.82	16.83	16.80	16.77	16.80	-0.02
100%	21.02	20.95	20.97	21.00	20.97	-0.05
Average					0.52	
Result					PASS	

Slope	0.9924	Interception	0.1200	Correlation Coefficient	1.0000
%Slope	-0.7612%	% Interception	0.4000%	% Correlation Coefficient	-0.0006%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preetchart Approve By Nakao Bani  
Date 2-Dec-24 Date 2-Dec-24



**MULTI-POINT GAS TEST REPORT OF OXYGEN**

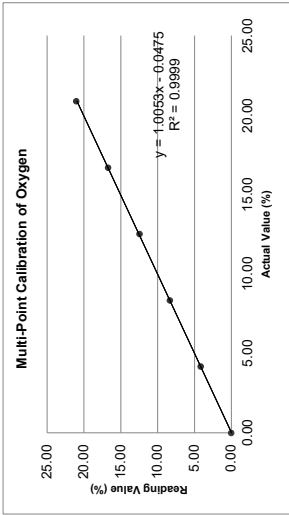
<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	25
Model	HORIBA PG-350	Background Coefficient	1.0259
Serial Number	V40KVOLD	Room Temperature	23.3 °C
<b>Standard Gas Information</b>			
Zero Gas	17K686056	Span Gas	ND60790
Cylinder Number	N2	Cylinder Number	O2
Component	%	Component	%
Concentration	99.999	Concentration	20.87
Expiration Date	-	Expiration Date	20-Jan-30
Measurement Range		25	
% Measurement Range		83.48	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.01	0.00	0.02	0.01	0.01
20%	4.17	4.12	4.11	4.21	4.15	-0.03
40%	8.35	8.33	8.35	8.30	8.33	-0.02
60%	12.52	12.44	12.46	12.43	12.44	-0.08
80%	16.70	16.67	16.74	16.71	16.71	0.01
100%	20.87	21.00	21.02	21.05	21.02	0.15
Average					0.73	0.47
Result					PASS	

Slope	1.0053	Interception	-0.0475	Correlation Coefficient	1.0000
% Slope	0.5294%	% Interception	-0.1898%	% Correlation Coefficient	-0.0036%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By	Precheck	Approve By	Nakao Sawai
Date	2-Dec-24	Date	2-Dec-24

**LOWER DETECTABLE LIMIT TESTING REPORT**

<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	23.3 °C
Model	HORIBA PG-350	Room Temperature	
Serial Number	V40KVOLD		
<b>Standard Gas Information</b>			
Zero Gas	17K686056	Component	N2
Cylinder Number		Concentration	99.999 %

Parameters	Measurement Range	Unit	Background	Coefficient
NO	100	ppm	1	0.9934
SO <sub>2</sub>	200	ppm	0	1.0684
CO	200	ppm	0	1.1705
CO <sub>2</sub>	30	%	0	1.004
O <sub>2</sub>	25	%	16	1.0078

**TESTING REPORT RESULTS**

Parameters	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	STDEV.
NO	0.20	0.20	0.30	0.20	0.10	0.30	0.20	0.30	0.10	0.10	0.082
SO <sub>2</sub>	0.30	0.20	0.30	0.40	0.40	0.40	0.50	0.60	0.50	0.40	0.115
CO	0.00	0.00	0.00	0.00	0.10	0.10	-0.10	0.10	-0.10	-0.10	0.082
CO <sub>2</sub>	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.02	0.007
O <sub>2</sub>	0.03	0.03	0.02	0.03	0.01	-0.01	-0.01	-0.02	-0.01	0.02	0.020

**Conclusion**

NO Lower detectable limit (LDL) value is 0.082 ppm  
SO<sub>2</sub> Lower detectable limit (LDL) value is 0.115 ppm  
CO Lower detectable limit (LDL) value is 0.082 ppm  
CO<sub>2</sub> Lower detectable limit (LDL) value is 0.007 % Vol.  
O<sub>2</sub> Lower detectable limit (LDL) value is 0.020 % Vol.

Test By	Precheck	Approve By	Nakao Sawai
Date	2-Dec-24	Date	2-Dec-24

**MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE**

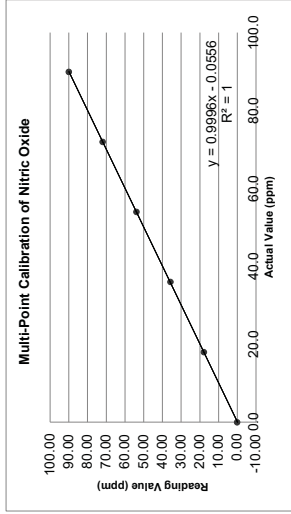
<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	
Model	HORIBA PG-350	Background Coefficient	0
Serial Number	V40KVOLD	Room Temperature	23.3 °C
<b>Standard Gas Information</b>			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	NO
Concentration	99.999 %	Concentration	89.94 ppm
Expiration Date	-	Expiration Date	28-Sep-30
Measurement Range		100	
% Measurement Range		89.94	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.1	0.1	0.10	0.10	
20%	17.99	17.80	18.00	17.90	-0.09	0.49
40%	35.98	36.00	35.50	35.73	-0.24	0.67
60%	53.96	54.10	53.50	53.80	-0.16	0.30
80%	71.95	71.70	72.00	71.90	-0.09	0.12
100%	89.94	89.80	90.00	90.10	0.03	0.32
Average					0.03	
Result					PASS	

Slope	0.9996	Interception	-0.0556	Correlation Coefficient	1.0000
%Slope	-0.0445%	% Interception	-0.0556%	% Correlation Coefficient	-0.0007%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By	Preedant	Approve By	Nakao Gani
Date	2-Dec-24	Date	2-Dec-24

**MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE**

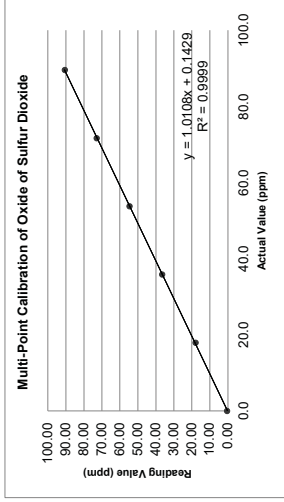
<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	
Model	HORIBA PG-350	Background Coefficient	1
Serial Number	V40KVOLD	Room Temperature	1.2894 °C
<b>Standard Gas Information</b>			
Zero Gas		Span Gas	
Cylinder Number	17K686056	Cylinder Number	ND58962
Component	N2	Component	SO2
Concentration	99.999 %	Concentration	89.98 ppm
Expiration Date	-	Expiration Date	28-Sep-30
Measurement Range		200	
% Measurement Range		44.79	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.4	0.2	0.4	0.33	
20%	17.92	18.20	17.60	17.80	-0.05	0.28
40%	35.83	37.00	36.20	36.10	0.43	1.68
60%	53.75	54.30	54.80	54.50	0.79	1.46
80%	71.66	72.80	73.10	72.60	1.17	1.63
100%	89.58	90.20	90.60	90.70	0.92	1.03
Average					1.21	
Result					PASS	

Slope	1.0108	Interception	0.1429	Correlation Coefficient	1.0000
%Slope	1.0802%	% Interception	0.0714%	% Correlation Coefficient	-0.0026%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By	Preedant	Approve By	Nakao Gani
Date	2-Dec-24	Date	2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE**

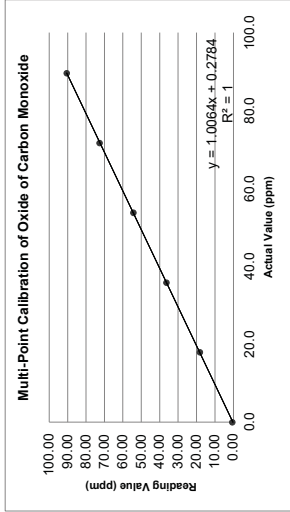
Equipment Information				21-Nov-24
Manufacturer	Horiba	Calibration Date		
Model	HORIBA PG-350	Background Coefficient	0	
Serial Number	V40KVOLD	Room Temperature	23.3 °C	
Standard Gas Information				
Zero Gas		Span Gas	ND58962	
Cylinder Number	17K686056	Cylinder Number	CO	
Component	N2	Component		
Concentration	99.999 %	Concentration	89.58 ppm	
Expiration Date	-	Expiration Date	28-Sep-30	
Measurement Range			200	
% Measurement Range			44.79	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.0	0.5	0.6	0.4	0.50	
20%	17.92	18.00	18.10	18.20	18.10	1.03
40%	35.83	36.20	36.40	36.32	36.31	1.32
60%	53.75	54.20	54.11	54.34	54.22	0.47
80%	71.66	72.42	72.34	72.90	72.55	0.89
100%	89.58	90.10	90.80	90.50	90.47	0.89
		Average			1.09	
		Result			PASS	

Slope	1.0064	Interception	0.2784	Correlation Coefficient	1.0000
%Slope	0.6448%	% Interception	0.1392%	% Correlation Coefficient	-0.0012%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preetchart Approve By Nakorn Bani  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE**

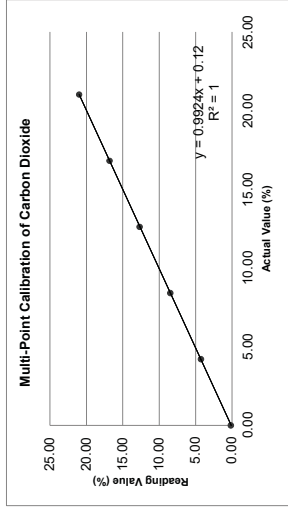
Equipment Information				21-Nov-24
Manufacturer	Horiba	Calibration Date		
Model	HORIBA PG-350	Background Coefficient	1	
Serial Number	V40KVOLD	Room Temperature	23.3 °C	
Standard Gas Information				
Zero Gas		Span Gas	ND11246	
Cylinder Number	17K686056	Cylinder Number	CO2	
Component	N2	Component		
Concentration	99.999 %	Concentration	21.02 %	
Expiration Date	-	Expiration Date	8-Aug-30	
Measurement Range			30	
% Measurement Range			70.07	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.12	0.14	0.16	0.14	0.14
20%	4.20	4.21	4.32	4.23	4.25	0.05
40%	8.41	8.44	8.46	8.48	8.46	0.05
60%	12.61	12.70	12.67	12.65	12.67	0.06
80%	16.82	16.83	16.80	16.77	16.80	-0.02
100%	21.02	20.95	20.97	21.00	20.97	-0.05
		Average			0.52	
		Result			PASS	

Slope	0.9924	Interception	0.1200	Correlation Coefficient	1.0000
%Slope	-0.7612%	% Interception	0.4000%	% Correlation Coefficient	-0.0006%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By Preetchart Approve By Nakorn Bani  
Date 2-Dec-24 Date 2-Dec-24

**MULTI-POINT GAS TEST REPORT OF OXYGEN**

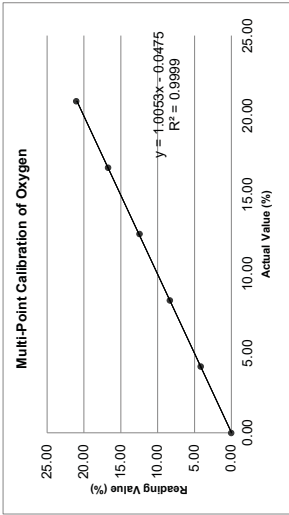
<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	25
Model	HORIBA PG-350	Background Coefficient	1.0259
Serial Number	V40KVOLD	Room Temperature	23.3 °C
<b>Standard Gas Information</b>			
Zero Gas	17K686056	Span Gas	ND60790
Cylinder Number	N2	Cylinder Number	O2
Component	%	Component	%
Concentration	99.999	Concentration	20.87
Expiration Date	-	Expiration Date	20-Jan-30
Measurement Range		25	
% Measurement Range		83.48	

**Multi-Point Gas Test Data**

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	0.01	0.00	0.02	0.01	0.01
20%	4.17	4.12	4.11	4.21	4.15	-0.03
40%	8.35	8.33	8.35	8.30	8.33	-0.02
60%	12.52	12.44	12.46	12.43	12.44	-0.08
80%	16.70	16.67	16.74	16.71	16.71	0.01
100%	20.87	21.00	21.02	21.05	21.02	0.15
Average					0.73	0.47
Result					PASS	PASS

Slope	1.0053	Interception	-0.0475	Correlation Coefficient	1.0000
% Slope	0.5294%	% Interception	-0.1898%	% Correlation Coefficient	-0.0036%
Result	PASS	Result	PASS	Result	PASS

**Multi-Point Gas Test Chart**



Test By	Precheck	Approve By	Nakao Sawai
Date	2-Dec-24	Date	2-Dec-24

**LOWER DETECTABLE LIMIT TESTING REPORT**

<b>Equipment Information</b>		21-Nov-24	
Manufacturer	Horiba	Calibration Date	23.3 °C
Model	HORIBA PG-350	Room Temperature	
Serial Number	V40KVOLD		
<b>Standard Gas Information</b>			
Zero Gas	17K686056	Component	N2
Cylinder Number		Concentration	99.999 %

Parameters	Measurement Range	Unit	Background	Coefficient
NO	100	ppm	1	0.9934
SO <sub>2</sub>	200	ppm	0	1.0684
CO	200	ppm	0	1.1705
CO <sub>2</sub>	30	%	0	1.004
O <sub>2</sub>	25	%	16	1.0078

**TESTING REPORT RESULTS**

Parameters	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	STDEV.
NO	0.20	0.20	0.30	0.20	0.10	0.30	0.20	0.30	0.10	0.10	0.082
SO <sub>2</sub>	0.30	0.20	0.30	0.40	0.40	0.40	0.50	0.60	0.50	0.40	0.115
CO	0.00	0.00	0.00	0.00	0.10	0.10	-0.10	0.10	-0.10	-0.10	0.082
CO <sub>2</sub>	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.02	0.007
O <sub>2</sub>	0.03	0.03	0.02	0.03	0.01	-0.01	-0.01	-0.02	-0.01	0.02	0.020

**Conclusion**

NO Lower detectable limit (LDL) value is 0.082 ppm  
SO<sub>2</sub> Lower detectable limit (LDL) value is 0.115 ppm  
CO Lower detectable limit (LDL) value is 0.082 ppm  
CO<sub>2</sub> Lower detectable limit (LDL) value is 0.007 % Vol.  
O<sub>2</sub> Lower detectable limit (LDL) value is 0.020 % Vol.

Test By	Precheck	Approve By	Nakao Sawai
Date	2-Dec-24	Date	2-Dec-24



**BANGKOK INDUSTRIAL GAS CO.,LTD.**  
1 Park Silom Tower, 24th Floor, Convent Road  
Silom, Bangkok, Bangkok 10500 Thailand  
Tel : (662) 481-6789 Fax : (662) 481-6790

Customer Name	: SGS (Thailand) Co., Ltd.	Delivery Date	: 21 Feb 2024
Product	: 110060	Analyzed Date	:
Product Name	: CY N2 UHP 7M3 47S CGA580	Best if used by	: -
Cylinder Type	: 47 LITERS STEEL	Delivery order	: 3300191491
Cylinder Valve	: CGA 580	Inspection lot	: 040000035171
Filling Pressure	: 2000 PSIG @ 27°C	Gas content	: 7 M3

COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD
Purity	%	99.9990					
Oxygen	ppm(V)		<3.0000				
Moisture	ppm(V)		<3.0000				
Carbon Monoxide	ppm(V)		<1.0000				
Carbon Dioxide	ppm(V)		<1.0000				
Total Hydrocarbon as CH <sub>4</sub>	ppm(V)		<1.0000				

Batch : 190224N201,120224N201  
Sampling Cylinder :  
Cylinder Serial Number : D045082,13D126013,17K686056,20K047009  
Remark :

**This certificate is issued electronically and is valid without a signature.**



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

**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer:	BANGKOK INDUSTRIAL	Reference Number:	160-402967999-1
Part Number:	GAS CO LTD	Cylinder Volume:	227.0 CF
Cylinder Number:	E04NI99E3HA0032	Cylinder Pressure:	2215 PSIG
Laboratory:	GN032079	Valve Outlet:	660
PGVP Number:	124 - Plumsteadville - PA A12024	Certification Date:	Feb 27, 2024
		Expiration Date:	Feb 27, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not fill. See Cylinder below 100 psia. I.e. 0.7 megapascals.

## ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	45.00 PPM	45.59 PPM	G1	+/- 1.0% NIST Tractable	02/20/2024, 02/27/2024
CARBON MONOXIDE	45.00 PPM	45.67 PPM	G1	+/- 0.7% NIST Tractable	02/20/2024
NITRIC OXIDE	45.00 PPM	45.59 PPM	G1	+/- 0.9% NIST Tractable	02/20/2024, 02/27/2024
SULFUR DIOXIDE	45.00 PPM	45.58 PPM	G1	+/- 0.7% NIST Tractable	02/20/2024, 02/27/2024
NITROGEN	Below LOD				

## CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	121017-32	KAL004540	48.24 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Aug 31, 2024
NTRM	210607-21	C0708065	48.41 PPM NITRIC OXIDE/NITROGEN	+/- 1.2%	Sep 21, 2025
GMIS	402551833-1	C0740452	51.54 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Dec 05, 2030
PRM	12395	D887660	9.91 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Feb 22, 2024
PRM	124066889139	C323707	4.97 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Sep 03, 2024
PRM	C2392001-1	D153445	9.87 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 22, 2024
GMIS	124066898128	C323207	4.236 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 22, 2024
SRM	1693a	FF25647	50.33 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%	Jan 04, 2027
SRM	0712202228187	EB0141234	50.05 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%	Jun 27, 2023
GMIS	0712202228187	EB0141234	50.05 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%	Dec 21, 2026

## ANALYTICAL EQUIPMENT

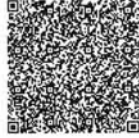
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AJP2010245 CO	FTIR	Feb 01, 2024
Nicolet iS50 FTIR AJP2010245 NO	FTIR	Feb 08, 2024
Nicolet iS50 FTIR AJP2010245 O2	FTIR	Feb 22, 2024
Nicolet iS50 FTIR AJP2010245 SO2	FTIR	Feb 22, 2024

*Michael A. Burke*  
Approved for Release

Approved for Release



**Triad Data Available Upon Request**  
NOTES: Gross Weight: 48.3 Kg  
Net Weight: 8.2 Kg



## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

**Customer:** BANGKOK INDUSTRIAL  
**Part Number:** GAS CO LTD  
**Cylinder Number:** E04N199E3HA0031  
**Laboratory:** 124 - Plumsteadville - PA  
**PGVP Number:** A12024  
**Gas Code:** CO, NO, NOX, SO2, BALN

**Reference Number:** 160-402968380-1  
**Cylinder Volume:** 247.0 CF  
**Cylinder Pressure:** 2215 PSIG  
**Valve Outlet:** 660  
**Certification Date:** Mar 05, 2024  
**Expiration Date:** Mar 05, 2032

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)\* document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
NOX	90.00 PPM	90.66 PPM	G1	02/27/2024, 03/05/2024
CARBON MONOXIDE	90.00 PPM	90.13 PPM	G1	02/27/2024
NITRIC OXIDE	90.00 PPM	90.65 PPM	G1	02/27/2024, 03/05/2024
SULFUR DIOXIDE	90.00 PPM	89.35 PPM	G1	02/27/2024, 03/05/2024
NITROGEN	Balance			

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No	Expiration Date
NTRM	110101-08	KAL003090	May 25, 2028
PRM	C2219101	APE1514048	Feb 25, 2025
GMS	2023042530	CC754387	Apr 25, 2031
PRM	C2392001.1	D153445	Nov 22, 2024
GMS	124206899128	CC323207	Jan 04, 2027
NTRM	160102-22	KAL003820	Nov 01, 2027

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Feb 01, 2024
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Feb 08, 2024
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Feb 22, 2024
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Feb 15, 2024

**Triad Data Available Upon Request**  
NOTES: Gross Weight: 48.2 Kg  
Net Weight: 8.1 Kg  
PO# 5224000763



*Michael R. Miller*  
Approved for Release



*Michael R. Miller*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD  
Cylinder Number: E02N88E200000C  
Laboratory: 5139910Y  
PGVP Number: 124 - Plumsteadville - PA  
Gas Code: A12023  
Reference Number: 160-402891090-1  
Cylinder Volume: 216.6 CF  
Cylinder Pressure: 2014 PSIG  
Valve Outlet: 590  
Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600R-12531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	12.00 %	12.09 %	G1	+/- 0.4% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model		Analytical Principle		Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-951 - O2		PARAMAGNETIC		Nov 08, 2023

#### Triad Data Available Upon Request

NOTES: Gross Weight: 59.3Kg  
Net Weight: 7.2 Kg  
PO# 5223006228



*Rich Allen*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD  
Cylinder Number: E02N79E200004DC  
Laboratory: 4621265Y  
PGVP Number: 124 - Plumsteadville - PA  
Gas Code: A12023  
Reference Number: 160-402891088-1  
Cylinder Volume: 218.0 CF  
Cylinder Pressure: 2014 PSIG  
Valve Outlet: 590  
Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600R-12531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	21.00 %	20.90 %	G1	+/- 0.5% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model		Analytical Principle		Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-951 - O2		PARAMAGNETIC		Nov 08, 2023

#### Triad Data Available Upon Request

NOTES: Gross Weight: 59.0 Kg  
Net Weight: 7.4 Kg  
PO# 5223006228



*Rich Allen*  
Approved for Release



## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL  
Customer PO Number: 5222003790  
Part Number: GAS CO LTD  
Reference Number: 160-402517687-1  
Cylinder Number: ND54008  
Cylinder Volume: 261.0 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2214 PSIG  
PGVP Number: A12022  
Valve Outlet: 580  
Gas Code: CO2.BALN  
Certification Date: Aug 26, 2022  
Expiration Date: Aug 26, 2030

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

Do Not Use This Cylinder below 100 psig, i.e. 6.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
CARBON DIOXIDE NITROGEN	13.00 % Balance	13.00 %	G1	08/26/2022
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	200605-04	6088256Y	24.53 % CARBON DIOXIDE/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Last Multipoint Calibration			
HORIBA VA5011 T516VU09P NDIR CO2	Aug 03, 2022			

#### Triad Data Available Upon Request

NOTES: NET WEIGHT 9.17 Kgs  
GROSS WEIGHT 49.06 Kgs  
PO# 5222003790



*Paul A. ...*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E02N179E3HA0000  
Reference Number: 82-401420321-1  
Cylinder Number: GN0018529  
Cylinder Volume: 271.2 CF  
Laboratory: 124 - Riverton (SAP) - NJ  
Cylinder Pressure: 2214 PSIG  
PGVP Number: B52019  
Valve Outlet: 580  
Gas Code: CO2.BALN  
Certification Date: Feb 14, 2019  
Expiration Date: Feb 14, 2027

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

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
CARBON DIOXIDE NITROGEN	21.00 % Balance	20.95 %	G1	02/14/2019
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	12081646	CC354843	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Last Multipoint Calibration			
HORIBA VIA 510-CO2-18GYCXEG	Feb 04, 2019			

#### Triad Data Available Upon Request

NOTES:  
Gross Weight: 109.98 lbs.  
Net Weight: 21.95 lbs.  
PO# 5219000555

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3082.05

*Paul A. ...*  
Approved for Release





Certificate of Conformity

BANGKOK INDUSTRIAL GAS CO.,LTD.  
1 Park Silom Tower, 24th Floor, Convent Road  
Silom, Bangkok, Bangkok 10500 Thailand  
Tel : (662) 481-6789 Fax : (662) 481-6790

<b>Customer Name</b> : SGS (Thailand) Limited		<b>Delivery Date</b> : 03 Jul 2025					
<b>Product</b> : 1100060		<b>Analysis Date</b> :					
<b>Product Name</b> : CY N2 UHP 7M3 47S CGA580		<b>Best if Use By</b> :					
<b>Cylinder Type</b> : 47 LITERS STEEL		<b>Delivery Order</b> : 3300010176					
<b>Cylinder Valve</b> : CGA 580		<b>Inspection Lot</b> : 40000005366					
<b>Filling Pressure</b> : 2000 PSIG @ 27°C		<b>Gas Content</b> : 7 M3					
COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD

Purity	%	99.9990					
Oxygen	ppm(V)	<3.0000					
Moisture	ppm(V)	<3.0000					
Carbon Monoxide	ppm(V)	<1.0000					
Carbon Dioxide	ppm(V)	<1.0000					
Total Hydrocarbon as CH4	ppm(V)	<1.0000					

Batch : 010725N201  
Sampling Cylinder :  
Cylinder Serial Number : D892075,11D062106,D9143166,11D126047  
Remark :

This certificate is issued electronically and is valid without a signature.



Airgas Specialty Gases  
Airgas USA LLC  
6041 Eastern Road  
Plumsteadville, PA 19949  
Airgas.com

CERTIFICATE OF ANALYSIS  
Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD  
Cylinder Number: ED4N199E3HA0032  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12024

Reference Number: 160-402967999-1  
Cylinder Volume: 247.0 CF  
Cylinder Pressure: 2215 PSIG  
Valve Outlet: 660  
Certification Date: Feb 27, 2024

Expiration Date: Feb 27, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedure stated. The assay procedure requires that the calibration standards be certified to the accuracy of the assay procedure, which is 95%. These are significant figures and affect the side of this calibration machine. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
NOX	45.00 PPM	45.59 PPM	G1	02/20/2024, 02/27/2024
CARBON MONOXIDE	45.00 PPM	45.67 PPM	G1	02/20/2024, 02/27/2024
NITRIC OXIDE	45.00 PPM	45.59 PPM	G1	02/20/2024, 02/27/2024
SULFUR DIOXIDE	45.00 PPM	45.58 PPM	G1	02/20/2024, 02/27/2024
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	120112-32	KAL004540	49.24 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%
NTRM	210607-21	CC708065	46.41 PPM NITRIC OXIDE/NITROGEN	+/- 1.2%
GMIS	402531833-1	CC740452	51.54 PPM NITROGEN DIOXIDE/AIR	+/- 0.9%
PRM	12395	D887660	9.91 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
GMIS	124206889139	CC323707	4.097 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
PRM	C2392001.1	D153445	9.87 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
GMIS	124206899128	CC323207	4.239 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
SRM	1693a	FF25467	50.33 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%
GMIS	07120222817	EB0141234	50.05 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%
The SRM, NTRM, PRM, or RGM noted above is only in reference to the GMS used in the assay and not part of the analysis.				
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
Nicolet ISS50 FTIR AUP2010245 CO	FTIR		Feb 01, 2024	
Nicolet ISS50 FTIR AUP2010245 NO	FTIR		Feb 08, 2024	
Nicolet ISS50 FTIR AUP2010245 NO2	FTIR		Feb 22, 2024	
Nicolet ISS50 FTIR AUP2010245 SO2	FTIR		Feb 15, 2024	



*Michael A. Nide*  
Approved for Release

**Triad Data Available Upon Request**

NOTES: Gross Weight: 48.3 Kg  
Net Weight: 8.2 Kg



**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL  
Customer PO Number: 738180-OJ  
Part Number: GAS CO LTD  
ED4N199E3HAC8TC  
Reference Number: 160-402529442-1  
Cylinder Number: ND58962  
Cylinder Volume: 225.0 CF  
Laboratory: 124 - Plumsteadville - PA  
Cylinder Pressure: 2001 PSIG  
PGVP Number: A12022  
Valve Outlet: 660  
Gas Code: CO, NO, NOX, SO2, BALN  
Certification Date: Sep 28, 2022  
Expiration Date: Sep 28, 2030

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

Do Not Use This Cylinder below 100 psig, i.e. 6.7 megapascals.

ANALYTICAL RESULTS					Assay Dates
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	
NOX	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable	09/21/2022, 09/28/2022
CARBON MONOXIDE	90.00 PPM	89.51 PPM	G1	+/- 0.6% NIST Traceable	09/21/2022
NITRIC OXIDE	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable	09/21/2022, 09/28/2022
SULFUR DIOXIDE	90.00 PPM	89.71 PPM	G1	+/- 0.9% NIST Traceable	09/21/2022, 09/28/2022
NITROGEN	Balance				

CALIBRATION STANDARDS			Uncertainty	Expiration Date
Type	Lot ID	Cylinder No		
NTRM	09010212	KAL004777	+/- 0.5%	Oct 16, 2024
PRM	12395	D887660	+/- 2.0%	Feb 22, 2022
NTRM	200610-16	CC733109	+/- 0.9%	Oct 06, 2026
GMIS	124206889110	CC322674	+/- 2.0%	Feb 25, 2025
NTRM	160102-18	KAL003796	+/- 0.8%	Nov 01, 2027

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

ANALYTICAL EQUIPMENT		Last Multipoint Calibration
Instrument/Make/Model	Analytical Principle	
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Sep 15, 2022
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Sep 22, 2022
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Sep 08, 2022
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Sep 01, 2022

**Triad Data Available Upon Request**

NOTES: Gross Weight: 46.8 Kg  
Net Weight: 7.4 Kg  
PO# 5222003790



*Michael R. Miller*  
Approved for Release



*Don Vane*  
Approved for Release

**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL

Part Number: E02N188E200000C  
Cylinder Number: 5139917Y  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12023  
Gas Code: O2,BALN

Reference Number: 160-402891090-1  
Cylinder Volume: 216.6 CF  
Cylinder Pressure: 2014 PSIG  
Valve Outlet: 590  
Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration gas. All components are a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
OXYGEN	12.00 %	12.07 %	+/- 0.4% NIST Traceable	11/27/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
SIEMENS OXYMAT 6 - N1-WS-951 - O2	PARAMAGNETIC		Nov 08, 2023	

Triad Data Available Upon Request

NOTES: Gross Weight: 59.3Kg  
Net Weight: 7.2 Kg  
PO# 5223006228



*Rich Alexander*  
Approved for Release

**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL

Part Number: E02N179E20004DC  
Cylinder Number: 5064040Y  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12023  
Gas Code: O2,BALN

Reference Number: 160-402891088-1  
Cylinder Volume: 218.0 CF  
Cylinder Pressure: 2014 PSIG  
Valve Outlet: 590  
Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration gas. All components are a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
OXYGEN	21.00 %	20.87 %	+/- 0.5% NIST Traceable	11/27/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
SIEMENS OXYMAT 6 - N1-WS-951 - O2	PARAMAGNETIC		Nov 08, 2023	

Triad Data Available Upon Request

NOTES: Gross Weight: 59.0 Kg  
Net Weight: 7.4 Kg  
PO# 5223006228



*Rich Alexander*  
Approved for Release



**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

**Customer:** BANGKOK INDUSTRIAL  
**Part Number:** GAS CO LTD  
**Cylinder Number:** E02N187E3HA0000  
**Laboratory:** ND14289  
**PGVP Number:** 124 - Plumsteadville - PA  
**Gas Code:** A12023  
**Reference Number:** 160-402887086-1  
**Cylinder Volume:** 261.0 CF  
**Cylinder Pressure:** 2214 PSIG  
**Valve Outlet:** 580  
**Certification Date:** Mar 20, 2023  
**Expiration Date:** Mar 20, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical maintenance. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	13.00 %	12.97 %	+/- 0.4% NIST Traceable	03/20/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NITRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VU9P	NDIR		Mar 15, 2023	

**Triad Data Available Upon Request**

**NOTES:**Gross Weight: 48.3 Kg  
Net Weight: 9.2 Kg  
PO# 5223001128



*Patricia A. Miller*  
Approved for Release

**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

**Customer:** BANGKOK INDUSTRIAL  
**Part Number:** GAS CO LTD  
**Cylinder Number:** E02N179E3HA0000  
**Laboratory:** ND11246  
**PGVP Number:** 124 - Plumsteadville - PA  
**Gas Code:** A12022  
**Reference Number:** 160-402500111-1  
**Cylinder Volume:** 271.0 CF  
**Cylinder Pressure:** 2214 PSIG  
**Valve Outlet:** 580  
**Certification Date:** Aug 08, 2022  
**Expiration Date:** Aug 08, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical maintenance. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	21.00 %	21.02 %	+/- 0.4% NIST Traceable	08/08/2022
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NITRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VU9P	NDIR		Aug 03, 2022	

**Triad Data Available Upon Request**

**NOTES:**Gross Weight: 49.2 Kg  
Net Weight: 10.0 Kg  
PO# 5222003790







Certificate of Conformity

BANGKOK INDUSTRIAL GAS CO.,LTD.  
1 Park Silom Tower, 24th Floor, Convent Road  
Silom, Bangkok, Bangkok 10500 Thailand  
Tel : (662) 481-6789 Fax : (662) 481-6790

<b>Customer Name</b> : SGS (Thailand) Limited		<b>Delivery Date</b> : 03 Jul 2025					
<b>Product</b> : 1100060		<b>Analysis Date</b> :					
<b>Product Name</b> : CY N2 UHP 7M3 47S CGA580		<b>Best if Use By</b> :					
<b>Cylinder Type</b> : 47 LITERS STEEL		<b>Delivery Order</b> : 3300010176					
<b>Cylinder Valve</b> : CGA 580		<b>Inspection Lot</b> : 40000005366					
<b>Filling Pressure</b> : 2000 PSIG @ 27°C		<b>Gas Content</b> : 7 M3					
COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD

Purity	%	99.9990					
Oxygen	ppm(V)	<3.0000					
Moisture	ppm(V)	<3.0000					
Carbon Monoxide	ppm(V)	<1.0000					
Carbon Dioxide	ppm(V)	<1.0000					
Total Hydrocarbon as CH4	ppm(V)	<1.0000					

Batch : 010725N201  
Sampling Cylinder :  
Cylinder Serial Number : D892075,11D062106,D9143166,11D126047  
Remark :

This certificate is issued electronically and is valid without a signature.



Airgas Specialty Gases  
Airgas USA LLC  
6041 Eastern Road  
Plumsteadville, PA 19949  
Airgas.com

CERTIFICATE OF ANALYSIS  
Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

Part Number: GAS CO LTD  
Cylinder Number: ED4N199E3HA0032  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12024

Reference Number: 160-402967999-1  
Cylinder Volume: 247.0 CF  
Cylinder Pressure: 2215 PSIG  
Valve Outlet: 660  
Certification Date: Feb 27, 2024

Expiration Date: Feb 27, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedure stated. The assay procedure requires that the calibration standards be certified to the accuracy of 95%. These are significant figures which affect the side of this calibration machine. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Assay Dates
NOX	45.00 PPM	45.59 PPM	G1	02/20/2024, 02/27/2024
CARBON MONOXIDE	45.00 PPM	45.67 PPM	G1	02/20/2024, 02/27/2024
NITRIC OXIDE	45.00 PPM	45.59 PPM	G1	02/20/2024, 02/27/2024
SULFUR DIOXIDE	45.00 PPM	45.58 PPM	G1	02/20/2024, 02/27/2024
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	120112-32	KAL004540	49.24 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%
NTRM	210607-21	CC700805	46.41 PPM NITRIC OXIDE/NITROGEN	+/- 1.2%
GMIS	402531833-1	CC740452	51.54 PPM NITROGEN DIOXIDE/AIR	+/- 0.9%
PRM	12395	D887660	9.91 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%
GMIS	124206889139	CC323707	4.097 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
PRM	C2392001.1	D153445	9.87 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
GMIS	124206899128	CC323207	4.239 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%
SRM	1693a	FF25467	50.33 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%
GMIS	07120222817	EB0141234	50.05 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.7%

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

ANALYTICAL EQUIPMENT	
Instrument/Make/Model	Analytical Principle
Nicolet ISS50 FTIR AUP2010245 CO	FTIR
Nicolet ISS50 FTIR AUP2010245 NO	FTIR
Nicolet ISS50 FTIR AUP2010245 NO2	FTIR
Nicolet ISS50 FTIR AUP2010245 SO2	FTIR

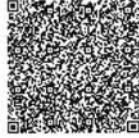
Last Multipoint Calibration  
Feb 01, 2024  
Feb 08, 2024  
Feb 22, 2024  
Feb 15, 2024



Approved for Release  
*Michael A. Nide*

**Triad Data Available Upon Request**

NOTES: Gross Weight: 48.3 Kg  
Net Weight: 8.2 Kg



**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL Customer PO Number: 738180-OJ  
Part Number: GAS CO LTD Reference Number: 160-402529442-1  
Cylinder Number: ED4N199E3HAC8TC Cylinder Volume: 225.0 CF  
Laboratory: 124 - Plumsteadville - PA Cylinder Pressure: 2001 PSIG  
PGVP Number: A12022 Valve Outlet: 660  
Gas Code: CO, NO, NOX, SO2, BALN Certification Date: Sep 28, 2022

**Expiration Date: Sep 28, 2030**

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Metrology does not require correction for analytical interference. This cylinder has a valid analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole-mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 6.7 megapascals.

ANALYTICAL RESULTS					Assay Dates
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	
NOX	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable	09/21/2022, 09/28/2022
CARBON MONOXIDE	90.00 PPM	89.51 PPM	G1	+/- 0.6% NIST Traceable	09/21/2022
NITRIC OXIDE	90.00 PPM	89.94 PPM	G1	+/- 1.2% NIST Traceable	09/21/2022, 09/28/2022
SULFUR DIOXIDE	90.00 PPM	89.71 PPM	G1	+/- 0.9% NIST Traceable	09/21/2022, 09/28/2022
NITROGEN	Balance				

CALIBRATION STANDARDS			Uncertainty	Expiration Date
Type	Lot ID	Cylinder No		
NTRM	09010212	KAL004777	+/- 0.5%	Oct 16, 2024
PRM	12395	D887660	+/- 2.0%	Feb 22, 2022
NTRM	200610-16	CC733109	+/- 0.9%	Oct 06, 2026
GMIS	124206889110	CC322674	+/- 2.0%	Feb 25, 2025
NTRM	160102-18	KAL003796	+/- 0.8%	Nov 01, 2027

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

ANALYTICAL EQUIPMENT		Last Multipoint Calibration
Instrument/Make/Model	Analytical Principle	
Nicolet IS50 FTIR AUP2010245 CO	FTIR	Sep 15, 2022
Nicolet IS50 FTIR AUP2010245 NO	FTIR	Sep 22, 2022
Nicolet IS50 FTIR AUP2010245 NO2	FTIR	Sep 08, 2022
Nicolet IS50 FTIR AUP2010245 SO2	FTIR	Sep 01, 2022

**Triad Data Available Upon Request**

NOTES: Gross Weight: 46.8 Kg  
Net Weight: 7.4 Kg  
PO# 5222003790



*Michael R. Miller*  
Approved for Release



*Don Vane*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N188E200000C

Cylinder Number: 5139917Y

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12023

Gas Code: O2,BALN

Reference Number: 160-402891090-1

Cylinder Volume: 216.6 CF

Cylinder Pressure: 2014 PSIG

Valve Outlet: 590

Certification Date: Nov 27, 2023

Expiration Date: Nov 27, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results are stated below and are subject to the standard except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	12.00 %	12.07 %	G1	+/- 0.4% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010205	K001516	23.2 % OXYGEN/NITROGEN	Jun 01, 2024
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle			
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC			

Triad Data Available Upon Request

NOTES: Gross Weight: 59.3Kg

Net Weight: 7.2 Kg

PO# 5223006228



*Rich Alex*  
Approved for Release

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA PROTOCOL STANDARD

Customer: BANGKOK INDUSTRIAL

GAS CO LTD

Part Number: E02N179E3HAC2EC

Cylinder Number: ND60790

Laboratory: 124 - Plumsteadville - PA

PGVP Number: A12022

Gas Code: O2,BALN

Reference Number: 160-402311012-1

Cylinder Volume: 250.6 CF

Cylinder Pressure: 2214 PSIG

Valve Outlet: 590

Certification Date: Jan 20, 2022

Expiration Date: Jan 20, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	21.00 %	20.87 %	G1	+/- 0.4% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08010230	K005228	23.20 % OXYGEN/NITROGEN	Jun 01, 2022
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle			
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC			

Triad Data Available Upon Request

NOTES: Gross Weight: 49.5 Kg

Net Weight: 9 Kg

Cylinder: 300 Aluminum

Valve: CGA 590 Brass

PO# 5221006285



*chuck*  
Approved for Release



**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: E02N187E3HA0000  
Laboratory: ND14289  
PGVP Number: 124 - Plumsteadville - PA  
Gas Code: A12023  
Valve Outlet: 580  
Certification Date: Mar 20, 2023  
Expiration Date: Mar 20, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical maintenance. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	13.00 %	12.97 %	+/- 0.4% NIST Traceable	03/20/2023
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NITRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VU9P	NDIR		Mar 15, 2023	

Triad Data Available Upon Request  
NOTES: Gross Weight: 48.3 Kg  
Net Weight: 9.2 Kg  
PO# 5223001128



*Patricia A. Miller*  
Approved for Release

**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA PROTOCOL STANDARD**

Customer: BANGKOK INDUSTRIAL  
Part Number: GAS CO LTD  
Cylinder Number: E02N179E3HA0000  
Laboratory: ND11246  
PGVP Number: 124 - Plumsteadville - PA  
Gas Code: A12022  
Valve Outlet: 580  
Certification Date: Aug 08, 2022  
Expiration Date: Aug 08, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical maintenance. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	21.00 %	21.02 %	+/- 0.4% NIST Traceable	08/08/2022
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NITRM	200605-04	6088256Y	24.63 % CARBON DIOXIDE/NITROGEN	Feb 08, 2027
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration	
HORIBA VAS011 TSV6VU9P	NDIR		Aug 03, 2022	

Triad Data Available Upon Request  
NOTES: Gross Weight: 49.2 Kg  
Net Weight: 10.0 Kg  
PO# 5222003790







Analyzer Calibration Data Sheet

Job No.	520050004-2	Date	10-Oct-25
Client Name	RAJCH PATAYANA	Pre Calibration	10:00:10.30
Plant Name	RAJCH PATAYANA	Post Calibration	10:00:18.10
Location	CHANDIGARH	Serial No.	115264007

Parameter	NO	Brand/Model	Thermo 43-HL	Serial No. 115264007				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	1.00
Calibration Span	100	ppm				Pass	100	1.00
Concentration(Mid-level)	45.35	ppm				Pass	45.35	1.00
Concentration(High-level)	90.70	ppm				Pass	90.70	1.00

Parameter	SO <sub>2</sub>	Brand/Model	Thermo 43-HL	Serial No. 1240322473				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	1.00
Calibration Span	100	ppm				Pass	100	1.00
Concentration(Mid-level)	45.35	ppm				Pass	45.35	1.00
Concentration(High-level)	90.70	ppm				Pass	90.70	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	45.35	(ppm)	45.35	-0.00	45.35	45.35	±5%	45.35	PASS
High-level gas	90.70	(ppm)	90.70	-0.00	90.70	90.70	±5%	90.70	PASS

Parameter	CO	Brand/Model	Thermo 48i	Serial No. 1152640010				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	0.952
Calibration Span	100	ppm				Pass	100	0.952
Concentration(Mid-level)	45.35	ppm				Pass	45.35	0.952
Concentration(High-level)	90.70	ppm				Pass	90.70	0.952

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	45.35	(ppm)	45.35	-0.00	45.35	45.35	±5%	45.35	PASS
High-level gas	90.70	(ppm)	90.70	-0.00	90.70	90.70	±5%	90.70	PASS

Parameter	O <sub>2</sub>	Brand/Model	A20220	Serial No. 3.26840.0.5				Coef.
				Equipment ID	CEMS 22201	Snoop Test	Span Value	
Span Value	20	% vol				Pass	20	1.00
Calibration Span	20	% vol				Pass	20	1.00
Concentration(Mid-level)	20.3	% vol				Pass	20.3	1.00
Concentration(High-level)	20.9	% vol				Pass	20.9	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	12.59	(ppm)	12.59	-0.01	12.59	12.59	±5%	12.59	PASS
High-level gas	20.90	(ppm)	20.90	-0.05	20.90	20.90	±5%	20.90	PASS

Parameter	CO	Brand/Model	Thermo 418	Serial No. 1152640010				Coef.
				Equipment ID	CEMS 11417	Snoop Test	Span Value	
Span Value	20.35	% vol				Pass	20.35	1.00
Calibration Span	20.35	% vol				Pass	20.35	1.00
Concentration(Mid-level)	20.35	% vol				Pass	20.35	1.00
Concentration(High-level)	20.95	% vol				Pass	20.95	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.01	0.00	0.00	±5%	0.00	PASS
Mid-level gas	13.00	(ppm)	13.00	-0.11	13.00	13.00	±5%	13.00	PASS
High-level gas	20.95	(ppm)	20.95	-0.05	20.95	20.95	±5%	20.95	PASS

Parameter	CH <sub>4</sub>	Brand/Model	Serial No.	Serial Number				Coef.
				Equipment ID	CEMS 11417	Snoop Test	Span Value	
Span Value	-	% vol				Pass	-	1.00
Calibration Span	-	% vol				Pass	-	1.00
Concentration(Mid-level)	-	% vol				Pass	-	1.00
Concentration(High-level)	-	% vol				Pass	-	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.01	0.00	0.00	±5%	0.00	PASS
Mid-level gas	12.89	(ppm)	12.89	-0.11	12.89	12.89	±5%	12.89	PASS
High-level gas	21.00	(ppm)	21.00	-0.05	21.00	21.00	±5%	21.00	PASS

Parameter	NMHC	Brand/Model	Serial No.	Serial Number				Coef.
				Equipment ID	CEMS 11417	Snoop Test	Span Value	
Span Value	-	% vol				Pass	-	1.00
Calibration Span	-	% vol				Pass	-	1.00
Concentration(Mid-level)	-	% vol				Pass	-	1.00
Concentration(High-level)	-	% vol				Pass	-	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	45.35	(ppm)	45.35	-0.00	45.35	45.35	±5%	45.35	PASS
High-level gas	90.70	(ppm)	90.70	-0.00	90.70	90.70	±5%	90.70	PASS

Inspector

Karande M

10-Oct-25

Approver

Mingram S.

10-Oct-25

Date

10-Oct-25

Date



System Calibration Data Sheet

Job No.	520050004-2	Date	09-10-2025
Client Name	RAJCH PATAYANA	Pre Calibration	10:00:10.30
Plant Name	RAJCH PATAYANA	Post Calibration	10:00:18.10
Location	CHANDIGARH	Serial No.	115264007

Parameter	NO	Brand/Model	Thermo 43-HL	Serial No. 115264007				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	1.00
Calibration Span	100	ppm				Pass	100	1.00
Concentration(Mid-level)	45.35	ppm				Pass	45.35	1.00
Concentration(High-level)	90.70	ppm				Pass	90.70	1.00

Parameter	SO <sub>2</sub>	Brand/Model	Thermo 43-HL	Serial No. 1240322473				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	1.00
Calibration Span	100	ppm				Pass	100	1.00
Concentration(Mid-level)	45.35	ppm				Pass	45.35	1.00
Concentration(High-level)	90.70	ppm				Pass	90.70	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	45.35	(ppm)	45.35	-0.00	45.35	45.35	±5%	45.35	PASS
High-level gas	90.70	(ppm)	90.70	-0.00	90.70	90.70	±5%	90.70	PASS

Parameter	CO	Brand/Model	Thermo 48i	Serial No. 1152640010				Coef.
				Equipment ID	CEMS 11421	Snoop Test	Span Value	
Span Value	100	ppm				Pass	100	0.952
Calibration Span	100	ppm				Pass	100	0.952
Concentration(Mid-level)	45.35	ppm				Pass	45.35	0.952
Concentration(High-level)	90.70	ppm				Pass	90.70	0.952

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	45.35	(ppm)	45.35	-0.00	45.35	45.35	±5%	45.35	PASS
High-level gas	90.70	(ppm)	90.70	-0.00	90.70	90.70	±5%	90.70	PASS

Parameter	O <sub>2</sub>	Brand/Model	A20220	Serial No. 3.26840.0.5				Coef.
				Equipment ID	CEMS 22201	Snoop Test	Span Value	
Span Value	20	% vol				Pass	20	1.00
Calibration Span	20	% vol				Pass	20	1.00
Concentration(Mid-level)	20.3	% vol				Pass	20.3	1.00
Concentration(High-level)	20.9	% vol				Pass	20.9	1.00

Status	Analyzer	Response	Calibration	Difference	Value	Result	Criteria	Value	Result
Zero gas	0.00	(ppm)	0.00	-0.00	0.00	0.00	±5%	0.00	PASS
Mid-level gas	12.59	(ppm)	12.59	-0.01	12.59	12.59	±5%	12.59	PASS
High-level gas	20.90	(ppm)	20.90	-0.05	20.90	20.90	±5%	20.90	PASS

Parameter	CO <sub>2</sub>	Brand/Model	Thermo 418	Serial No. 1170050010				Coef.
				Equipment ID	CEMS 11411	Snoop Test	Span Value	
Span Value	20	% vol				Pass	20	1.00
Calibration Span	20	% vol				Pass	20	1.00
Concentration(Mid-level)	20.35	% vol				Pass	20.35	1.00
Concentration(High-level)	20.95	% vol				Pass	20.95	1.00

Status	Analyzer	Calibration	Response	Initial Value			Criteria			Final Value			Criteria			Drift	Criteria																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
				System	Calibration	Response	Value	Result	System	Verification	Response	Bits	System	Value	Result																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
																		System	Calibration	Response	Value	Result	System	Verification	Response	Bits	System	Value	Result																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
																														System	Calibration	Response	Value	Result	System	Verification	Response	Bits	System	Value	Result																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Zero gas		(AI)	0.01	0.02	0.05																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		





Analyzer Calibration Data Sheet

Job No.	50005084	Date	3-Oct-23
Client Name	WSPS Polymers	Pre Calibration	09:30-10:00
Plant Name	Chowdary	Post Calibration	10:00-10:30
Location	Chowdary	Shift Name	10:00-10:30
Brand/Model	NO	Serial No.	WORKVOLD
Span Value	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972
Parameter	NO	Serial No.	WORKVOLD
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Gas Cylinder	Calibration	Difference	Value	Result
Analyzer Response (ppm)				
Zero gas	0.00	0.00	0.00	45%
Mid-level gas	10.00	-0.01	9.99	45%
High-level gas	20.00	-0.04	19.96	45%

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Inspector	Mingyuan S.	Date	07-Oct-23
Approver	Karmvika M.	Date	07-Oct-23



System Calibration Data Sheet

Job No.	50005084	Date	03/10/2025
Client Name	WSPS Polymers	Pre Calibration	09:30-10:00
Plant Name	Chowdary	Post Calibration	10:00-10:30
Location	Chowdary	Shift Name	10:00-10:30
Brand/Model	NO	Serial No.	VAROOLD
Span Value	ppm	Equipment ID	CEMS 3354
Calibration Span	ppm	Equipment ID	CEMS 3354
Mid or High Level Gas	ppm	Equipment ID	CEMS 3354

Status	Analyzer	InterVUE				Criteria		Final Value		Criteria		Drift		Criteria	
		Calibration Response (%)	System Bias (%)	System Calibration Response (%)	System Bias (%)	Value (%)	Result (%)	Verification Response (%)	System Bias (%)	Value (%)	Result (%)	Value (%)	Result (%)	Value (%)	Result (%)
NO	20141316	CEMS 3354	Pass	20141316	20003079	20252972	20141316	20003079	20252972	20141316	20003079	20252972	20141316	20003079	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Brand/Model	Serial No.	Equipment ID	Span Test
NO	20141316	CEMS 3354	Pass
Calibration Span	ppm	Cylinder No (Zero)	20141316
Concentration (Mid-level)	ppm	Cylinder No (Mid-level)	20003079
Concentration (High-level)	ppm	Cylinder No (High-level)	20252972

Inspector	Mingyuan S.	Date	07-Oct-23
Approver	Karmvika M.	Date	07-Oct-23



### Analyzer Calibration Data Sheet

Job No.	50005684	Date	3-Oct-25
Client Name	WEST PHARMA	Pre Calibration	09:30-10:00
Plant Name	WEST PHARMA	Post Calibration	10:00-10:30
Location	CHANDLER	Batch Name	18857-80
Brand/Model	NO	Serial No.	WORKVOLD
Parameter	NO	Cylinder No (Zero)	20113168
Calibration Span	33.94	Cylinder No (Mid-level)	020032079
Concentration (Mid-level)	45.00	Cylinder No (High-level)	020032079
Concentration (High-level)	65.00		

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	33.94	33.94	-0.04	-0.04	45% <b>PASS</b>
High-level gas	65.00	65.00	-0.04	-0.04	45% <b>PASS</b>

Parameter	NO	Brand/Model	NO	Serial No.	WORKVOLD
Span Value	33.94	ppm	33.94	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94	Cylinder No (Zero)	20113168
Concentration (Mid-level)	45.00	ppm	45.00	Cylinder No (Mid-level)	020032079
Concentration (High-level)	65.00	ppm	65.00	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	33.94	33.94	-0.04	-0.04	45% <b>PASS</b>
High-level gas	65.00	65.00	-0.04	-0.04	45% <b>PASS</b>

Parameter	CO	Brand/Model	CO	Serial No.	WORKVOLD
Span Value	33.97	ppm	33.97	Equipment ID	CEMS 3354
Calibration Span	33.97	ppm	33.97	Cylinder No (Zero)	20113168
Concentration (Mid-level)	45.00	ppm	45.00	Cylinder No (Mid-level)	020032079
Concentration (High-level)	65.00	ppm	65.00	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	33.94	33.94	-0.04	-0.04	45% <b>PASS</b>
High-level gas	65.00	65.00	-0.04	-0.04	45% <b>PASS</b>

Parameter	O <sub>2</sub>	Brand/Model	O <sub>2</sub>	Serial No.	WORKVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Cylinder No (Zero)	20113168
Concentration (Mid-level)	21.02	% vol	21.02	Cylinder No (Mid-level)	020032079
Concentration (High-level)	21.02	% vol	21.02	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	21.02	21.02	-0.04	-0.04	45% <b>PASS</b>
High-level gas	42.04	42.04	-0.04	-0.04	45% <b>PASS</b>

Parameter	CO	Brand/Model	CO	Serial No.	WORKVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Cylinder No (Zero)	20113168
Concentration (Mid-level)	21.02	% vol	21.02	Cylinder No (Mid-level)	020032079
Concentration (High-level)	21.02	% vol	21.02	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	21.02	21.02	-0.04	-0.04	45% <b>PASS</b>
High-level gas	42.04	42.04	-0.04	-0.04	45% <b>PASS</b>

Parameter	CH <sub>4</sub>	Brand/Model	CH <sub>4</sub>	Serial No.	WORKVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Cylinder No (Zero)	20113168
Concentration (Mid-level)	21.02	% vol	21.02	Cylinder No (Mid-level)	020032079
Concentration (High-level)	21.02	% vol	21.02	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	21.02	21.02	-0.04	-0.04	45% <b>PASS</b>
High-level gas	42.04	42.04	-0.04	-0.04	45% <b>PASS</b>

Parameter	NH <sub>3</sub>	Brand/Model	NH <sub>3</sub>	Serial No.	WORKVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Cylinder No (Zero)	20113168
Concentration (Mid-level)	21.02	% vol	21.02	Cylinder No (Mid-level)	020032079
Concentration (High-level)	21.02	% vol	21.02	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	21.02	21.02	-0.04	-0.04	45% <b>PASS</b>
High-level gas	42.04	42.04	-0.04	-0.04	45% <b>PASS</b>

Parameter	NO	Brand/Model	NO	Serial No.	WORKVOLD
Span Value	33.94	ppm	33.94	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94	Cylinder No (Zero)	20113168
Concentration (Mid-level)	45.00	ppm	45.00	Cylinder No (Mid-level)	020032079
Concentration (High-level)	65.00	ppm	65.00	Cylinder No (High-level)	020032079

Status	Gas Cylinder	Calibration		Criteria	
		Analyzer Response (ppm)	Difference (ppm)	Value (% of Span)	Result
Zero gas	0.00	0.00	0.00	0.00	45% <b>PASS</b>
Mid-level gas	33.94	33.94	-0.04	-0.04	45% <b>PASS</b>
High-level gas	65.00	65.00	-0.04	-0.04	45% <b>PASS</b>



### System Calibration Data Sheet

Job No.	50005684	Date	03/10/2025
Client Name	WEST PHARMA	Pre Calibration	09:30-10:00
Plant Name	WEST PHARMA	Post Calibration	10:00-10:30
Location	CHANDLER	Batch Name	18857-80
Brand/Model	NO	Serial No.	VARVOLD
Parameter	NO	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94
Mid or High Level Gas	45.00	ppm	45.00

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	NO	Brand/Model	NO	Serial No.	VARVOLD
Span Value	33.94	ppm	33.94	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	ppm	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	CO	Brand/Model	CO	Serial No.	VARVOLD
Span Value	33.94	ppm	33.94	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	ppm	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	O <sub>2</sub>	Brand/Model	O <sub>2</sub>	Serial No.	VARVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	% vol	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	CH <sub>4</sub>	Brand/Model	CH <sub>4</sub>	Serial No.	VARVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	% vol	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	NH <sub>3</sub>	Brand/Model	NH <sub>3</sub>	Serial No.	VARVOLD
Span Value	21.02	% vol	21.02	Equipment ID	CEMS 3354
Calibration Span	21.02	% vol	21.02	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	% vol	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Parameter	NO	Brand/Model	NO	Serial No.	VARVOLD
Span Value	33.94	ppm	33.94	Equipment ID	CEMS 3354
Calibration Span	33.94	ppm	33.94	Equipment ID	CEMS 3354
Mid or High Level Gas	45.00	ppm	45.00	Equipment ID	CEMS 3354

Status	Analyzer Calibration Response (A)	System Calibration Response (B)	Criteria		Drift	Value	Result
			Value (%)	Result			
Zero gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>
Upstate gas	45.00	45.30	-0.33	45%	0.33	45%	<b>PASS</b>

Inspector *Mingyuan S.*

Approver *Karimkha M.*

Date 07-Oct-25

Date 07-Oct-25



**ANALYTICAL BALANCE**

**Model : MS204TS/00**

**Serial No. : B904136539**

Mettler-Toledo (Thailand) Ltd.  
846/4 - 846/5 Lasalle Rd., Bangna Tai Sub-District  
Bangna District, Bangkok 10260  
+66 2723 0382  
MT-TL-ServiceSupport@mt.com



## Accuracy Calibration Certificate

### Customer

Company: EASTERN THAI CONSULTING 1992 CO., LTD.  
Address: 683 Moo 11, Sukhaphiban 8 Rd., Nong Kham  
City: Sriracha  
Zip / Postal: 20230  
State / Province: Chonburi  
Contact: Sasiporn Nakin  
Order Number: 0333352196

### Weighing Device

Manufacturer: Mettler Toledo  
Model: MS204TS/00  
Serial No.: B904136539  
Building: Laboratory  
Floor: 1  
Room: Balance  
Instrument Type: Weighing Instrument  
Asset Number: LABE 05/4  
Terminal Model: N/A  
Terminal Serial No.: N/A  
Terminal Asset No.: N/A

Range	Max Capacity	Readability (g)
1	220 g	0.0001 g

### Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)  
METTLER TOLEDO Work Instruction: CPW002/20  
This calibration certificate contains measurements for As Found calibration. No As Found calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.  
The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.  
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Start: 24.2 °C	End: 24.3 °C	Start: 37.9 %	End: 37.9 %
	Temperature		Humidity	

As Found Calibration Date: 29-Jan-2025  
As Left Calibration Date: N/A  
Issue Date: 01-Feb-2025  
Calibrator: Khomsan Prataung  
Approved Signatory: Naruephon C.

Technical Manager / Head of Calibration Center

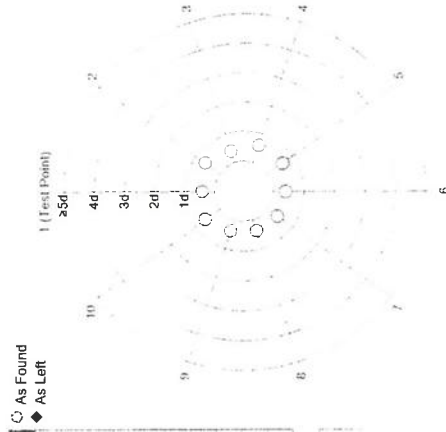


### Measurement Results

#### Repeatability

Test Load: 100 g

	As Found	As Left
1	100.0000 g	N/A
2	99.9999 g	N/A
3	100.0000 g	N/A
4	99.9999 g	N/A
5	99.9999 g	N/A
6	100.0000 g	N/A
7	100.0000 g	N/A
8	100.0000 g	N/A
9	100.0000 g	N/A
10	99.9999 g	N/A
Standard Deviation	0.00005 g	N/A

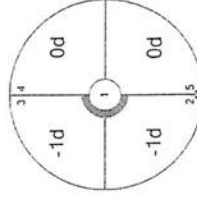


The "g" in the graph represents the readability of the range/interval in which the test was performed.  
The results of this graph are based upon the absolute values of the differences from the mean value.

### Eccentricity

Test Load: 100 g

Position	As Found	As Left
1	100.0000 g	N/A
2	99.9999 g	N/A
3	99.9999 g	N/A
4	100.0000 g	N/A
5	100.0000 g	N/A
Maximum Deviation	0.00001 g	N/A



As Found

The "g" in the graph represents the readability of the range/interval in which the test was performed.



Error of Indication

As Found				
	Reference Value	Indication	Error of Indication	Expanded Uncertainty
1	0.0000 g	0.0000 g	0.0000 g	0.12 mg
2	0.0100 g	0.0100 g	0.0000 g	0.13 mg
3	0.0500 g	0.0500 g	0.0000 g	0.13 mg
4	0.1000 g	0.1000 g	0.0000 g	0.13 mg
5	1.0000 g	1.0000 g	0.0000 g	0.13 mg
6	5.0000 g	5.0000 g	0.0000 g	0.14 mg
7	10.0000 g	10.0000 g	0.0000 g	0.14 mg
8	50.0000 g	50.0000 g	0.0000 g	0.16 mg
9	100.0000 g	100.0000 g	0.0000 g	0.24 mg
10 <sup>1</sup>	150.0000 g	150.0001 g	0.0001 g	0.31 mg
11 <sup>1</sup>	200.0000 g	200.0002 g	0.0002 g	0.35 mg

<sup>1</sup>The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.

○ As Found

◆ As Left

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

Calibration Points (g)

The expanded measurement uncertainty is reported as the standard measurement uncertainty multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.  
The results of this calibration certificate relate only to the calibrated item.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.:	WS32	Date of Issue:	07-Aug-2024
Certificate Number:	193673	Calibration Due Date:	30-Jan-2026

Weight Set 2: OIML E2

Weight Set No.:	WS32-1	Date of Issue:	06-Sep-2024
Certificate Number:	C436717337	Calibration Due Date:	26-Jan-2026

Thermo Hygrometer

Equipment No.:	IN277	Date of Issue:	19-Jun-2024
Certificate Number:	SG-H-00575/67	Calibration Due Date:	18-Jun-2025

Remarks

FACT adjustment functionally activated

Equipment condition: Good

Next calibration according to customer's procedure

Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: 1.5 · 10<sup>-6</sup> / K  
Temperature range on site for the evaluation of the measurement uncertainty in use: 5 K

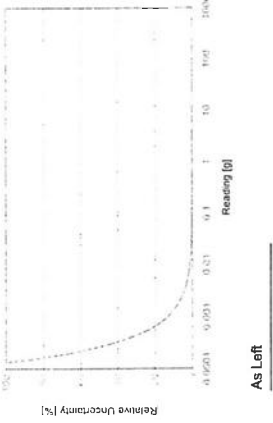
Linearization of Uncertainty Equation

Range		As Found		As Left	
d	Max				
1	0.0001 g	220 g	$U_1 = 0.13 \text{ mg} + 0.00598 \text{ mg/g} \cdot R$		N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication		As Found		As Left	
0.0220 g		0.13 mg	0.59%	N/A	N/A
0.2200 g		0.13 mg	0.060%	N/A	N/A
2.2000 g		0.14 mg	0.0065%	N/A	N/A
22.0000 g		0.26 mg	0.0012%	N/A	N/A
220.0000 g		1.4 mg	0.00066%	N/A	N/A



GWP®  
Certificate



As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed:



As Found



As Left

No adjustments/modifications made, As Left results correspond to As Found.

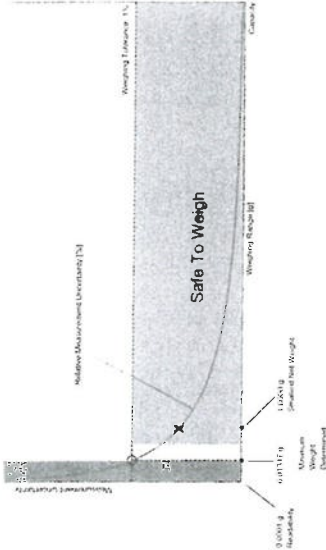
Process Requirements

Weighing Tolerance: 1%

Smallest Net Weight: 1.0000 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.



## Minimum Weight

### As Found Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.13245 g	0.26650 g	0.40219 g	0.67859 g	1.40037 g
0.2%	0.06603 g	0.13245 g	0.19927 g	0.33414 g	0.67859 g
0.5%	0.02636 g	0.05279 g	0.07928 g	0.13245 g	0.26650 g
1%	0.01317 g	0.02636 g	0.03957 g	0.06603 g	0.13245 g
2%	0.00658 g	0.01317 g	0.01977 g	0.03296 g	0.06603 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01317 g	0.02636 g

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

### As Left Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.13245 g	0.26650 g	0.40219 g	0.67859 g	1.40037 g
0.2%	0.06603 g	0.13245 g	0.19927 g	0.33414 g	0.67859 g
0.5%	0.02636 g	0.05279 g	0.07928 g	0.13245 g	0.26650 g
1%	0.01317 g	0.02636 g	0.03957 g	0.06603 g	0.13245 g
2%	0.00658 g	0.01317 g	0.01977 g	0.03296 g	0.06603 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01317 g	0.02636 g

✓ Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with  $k = 2$  and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

#### Notes on minimum weight values in above table:

1. If "N/A" is shown above, no appropriate value could be calculated.
2. METTLER TOLEDO is not responsible for the definition of the process requirements.

## Measurement Results

### Results Summary

Repeatability				Eccentricity		Error of Indication	
As Found	As Left	Control Limit	Std. Deviation	Result	As Left	Std. Deviation	Result
✓ = Passed	✓	0.00050 g		✓	✓		✓
✗ = Failed	✓	0.00100 g		✓			✓
FS = Safety Factor not met		0.00250 g		✓			
		0.00500 g	0.00005 g	✓		0.00005 g	✓
		0.01000 g		✓			✓
		0.02500 g		✓			✓

### Repeatability

Test Load: 100 g

Repeatability				Eccentricity		Error of Indication	
As Found	As Left	Control Limit	Std. Deviation	Result	As Left	Std. Deviation	Result
0.1%		0.00050 g		✓			✓
0.2%		0.00100 g		✓			✓
0.5%		0.00250 g		✓			✓
1%		0.00500 g	0.00005 g	✓		0.00005 g	✓
2%		0.01000 g		✓			✓
5%		0.02500 g		✓			✓

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

### Eccentricity

Test Load: 100 g

Repeatability				Eccentricity		Error of Indication	
As Found	As Left	Control Limit	Std. Deviation	Result	As Left	Std. Deviation	Result
0.1%		0.00050 g		✓			✓
0.2%		0.00100 g		✓			✓
0.5%		0.00250 g		✓			✓
1%		0.00500 g	0.00005 g	✓		0.00005 g	✓
2%		0.01000 g		✓			✓
5%		0.02500 g		✓			✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Error of Indication

As Found

Reference Value		Error	Control limits for various weighing tolerances						
			0.1%	0.2%	0.5%	1%	2%	5%	
0.0000 g	0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A	
50.0000 g	0.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g	
100.0000 g	0.0000 g	0.0000 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g	
150.0000 g	0.0001 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g	
200.0000 g	0.0002 g	0.0002 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g	
Result			✓	✓	✓	✓	✓	✓	

As Left

Reference Value		Error	Control limits for various weighing tolerances						
			0.1%	0.2%	0.5%	1%	2%	5%	
0.0000 g	0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A	
50.0000 g	0.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g	
100.0000 g	0.0000 g	0.0000 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g	
150.0000 g	0.0001 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g	
200.0000 g	0.0002 g	0.0002 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g	
Result			✓	✓	✓	✓	✓	✓	

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.



## **BAROMETER**

**Serial No. : N/A[S41020124]**



# CALIBRATION LABORATORY CO., LTD.

2/10-11, 55 Soi Prasert Manukul 29 Yaek 4, Prasert Manukul Rd., Ladphrao, Bangkok 10230  
Tel: 02-578-0353-4 Fax: 02-578-2672 www.cal-lab.co.th Email: sale@cal-lab.co.th



## CERTIFICATE OF CALIBRATION

### FOR

NOMENCLATURE : BAROMETER  
MANUFACTURER : BARIO  
MODEL / TYPE : N/A  
SERIAL NO. : N/A[S41020124]  
CLID. NO. : 212500828  
JOB CONTROL NO. : 250507051351  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 MOO 11, SUKHAPIBARN 8 RD,  
NONGKHAM, SRIRACHA, CHONBURI 20230

DATE OF RECEIVED : 07 May 2025 DATE OF ISSUED : 09 May 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Sittipong Pimdee  
Calibration Engineer



Approved By : Mongkol Yotsoontorn  
Authorized Signatory  
09 May 2025

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25051351  
F3-011-05/12-23

page 1 of 3



ectcollaboration



# CALIBRATION LABORATORY CO., LTD.

2/10-11, 55 Soi Prasert Manukul 29 Yaek 4, Prasert Manukul Rd., Ladphrao, Bangkok 10230  
Tel: 02-578-0353-4 Fax: 02-578-2672 www.cal-lab.co.th Email: sale@cal-lab.co.th



## REPORT OF CALIBRATION

### FOR

NOMENCLATURE : BAROMETER  
MANUFACTURER : BARIO  
MODEL / TYPE : N/A  
SERIAL NO. : N/A[S41020124]  
DATE OF CALIBRATION : 08 May 2025

#### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$

Relative Humidity :  $(55 \pm 10) \% \text{RH}$

#### PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPPP-08 according to DKD-R 6-1 as calibration guidelines.

The calibration was performed by direct measurement with Reference Pressure Monitor which maintained by the Calibration Laboratory Co., Ltd.

#### REFERENCE STANDARD USED :

Reference Pressure Monitor, Fluke Model RPM3 S/N. 829.

#### TRACEABILITY :

The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand).  
Certificate No. MP-0245-24, Due Date 11 November 2025.

#### UNCERTAINTY :

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor of  $k = 2$ . It has been evaluated according to the "Calibration of Pressure Gauges (DKD-R 6-1)" which provides a level of confidence approximately 95%.

Certificate No. Q25051351  
F3-011-05/12-23

page 2 of 3



ectcollaboration





# CALIBRATION LABORATORY CO., LTD.

27/0-11, 14, 55 Soi Prasert Manukit, 29 Yaek, 4, Phasert Manukit Rd., Jodphrao, Bangkok 10230  
Tel 02-578-0353-4 Fax 02-578-2672 www.ccllaboratory.com E-mail:sale@calibration.com



Accredited  
ISO/IEC 17025

## CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

### MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment

The DUC was exercised by applying a known pressure from its zero to full scale 1 times. Then 2 series of known gauge pressure were applied. The STD reading were recorded and the means value were reported in the table below.

### CALIBRATION DATA

#### CORRECTION OF PRESSURE

DUC Test point ( hPa )	STD Reading ( hPa )		Correction ( hPa )	
	Up	Down	Up	Down
990	990.7	990.7	+0.7	+0.7
1000	1000.7	1000.8	+0.7	+0.8
1010	1010.8	1010.8	+0.8	+0.8
1020	1020.8	1020.9	+0.8	+0.9
1030	1030.9	1030.9	+0.9	+0.9

Uncertainty of measurement  $\pm 0.7$  hPa

Transmitting fluid : Air.

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 01.5 Page 44 of 68

This report is valid for the above stated instrument/s only.

### End of Certificate ###

Certificate No. Q25051351

F3-011-05/12-23

**COPY**



@Calibration

**CERTIFICATE OF ANALYSIS**

**EPA PROTOCOL GAS**

**Cylinder No. : EB0062815**

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E04NI99E15ACX9C  
Cylinder Number: EB0062815  
Laboratory: 124 - Riverton (SAP) - NJ  
PGVP Number: B52018  
Gas Code: CO,NO,NOX,SO2,BALN

Reference Number: 82-401135335-1  
Cylinder Volume: 144.4 CF  
Cylinder Pressure: 2015 PSIG  
Valve Outlet: 680  
Certification Date: Mar 13, 2018  
Expiration Date: Mar 13, 2026

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

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	50.00 PPM	50.55 PPM	G1	+/- 1.4% NIST Traceable
NITRIC OXIDE	50.00 PPM	50.50 PPM	G1	+/- 1.4% NIST Traceable
SULFUR DIOXIDE	50.00 PPM	51.01 PPM	G1	+/- 1.0% NIST Traceable
CARBON MONOXIDE	2000 PPM	1977 PPM	G1	+/- 1.0% NIST Traceable
NITROGEN	Balance			
Assay Dates				
				03/06/2018, 03/13/2018
				03/06/2018, 03/13/2018
				03/06/2018, 03/13/2018
				03/06/2018, 03/13/2018

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No	Expiration Date
NTRM	16060807	CC442554	Jun 27, 2020
PRM	12367	APEX1099237	Jun 02, 2017
GMIS	0315201604	CC503358	Mar 15, 2019
NTRM	16011025	CC473218	Jun 07, 2022
NTRM	12060735	CC356192	Dec 14, 2026
The SRM, PRM or RGM noted above is only in reference to the GMS used in the assay and not part of the analysis.			

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO	FTIR	Feb 08, 2018
Nicolet 6700 APW1100391 NO	FTIR	Feb 15, 2018
Nicolet 6700 APW1100391 NO2	FTIR	Feb 16, 2018
Nicolet 6700 APW1100391 SO2	FTIR	Mar 01, 2018

Triad Data Available Upon Request

NOTES: NET WEIGHT: 10.43lbs

GROSS WEIGHT: 60.93lbs

PO# 5218000763

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



TESTING CERT No. 3082.05

*Don Morris*  
Approved for Release

**Hot Air Oven**

**Model : UFE 500**

**Serial No. : G511.0182**



NSC-TSI-TSI7025  
CALIBRATION 0152

Page 1 of 3

Certificate No. : 24-164691

Sample Code : 24-67405-001

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

663 Moo 11, Sukhapiarn 8 Rd, Nongkham,

Sriacha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.

(Hot Lab)

Equipment : Temperature controlled enclosures (Hot air oven)

Manufacturer : Memmert Model : UFE 500

Serial No. : GS11-0182 ID No. : LABE 1714

Date of Receipt : 19 December 2024 Date of Calibration : 19 December 2024

## Condition of Calibration

1. Environment	1.1 Ambient temperature	: Maximum	32.0 °C	: Minimum	31.0 °C
	1.2 Relative humidity	: Maximum	48.5 %	: Minimum	43.5 %
	1.3 Line voltage supplied	: Maximum	226.3 VAC	: Minimum	222.0 VAC

## 2. Calibration method

TLAS-G-20: Guidelines for calibration and checks of temperature controlled enclosures.

## 3. Reference standard instrument

Instrument	ID No.	Certificate No.	Due Date
Data Acquisition With Sensor (RTD-P100)	LB-DA-11 (RTD-138 to RTD-146)	24-040191	07 April 2025

## 4. This certificate is traceable to the international system of unit (SI Unit).

The measurement is traceable to Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

## 5. This result of calibration was found accurate as shown on date and place of calibration only.

## 6. Condition of calibration item : Normal

Calibrated by

Mr. Nopanon Anusak

(Mr. Somchai Neampunt)

Scientist

Signed for Director

Issue date

20 December 2024

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which was assessed by the Thai Laboratory Accreditation Authority (TLAA) and is traceable to recognized national standards and to the unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

NSC-TSI-TSI7025  
CALIBRATION 0152

Page 2 of 3

Certificate No. : 24-164691

Sample Code : 24-67405-001

## REPORT OF CALIBRATION

## Results of Calibration

Resolution : 0.5 °C

## 1. Reporting of Temperature

Calibration point (°C)	UUC: setting (°C)	UUC* reading (°C)	Measured temperature at each positions (°C)								Uncertainty ± (°C)	Coverage factor k	
			# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8			# g <sup>ref</sup>
104	103.5	103.5	104.14	104.15	103.80	104.15	104.09	104.19	103.85	103.65	104.22	0.47	2.00

## 2. Characterization results

Calibration point (°C)	Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
104	0.07	0.63	0.69

## Notes

UUC\* = Unit Under Calibration

COPY

# REPORT OF CALIBRATION

Page 3 of 3

Certificate No. : 24-164691

Sample Code : 24-67405-001

## Results of Calibration

### Notes

1. Sensor installation locations
  - 1.1 All sensors at any corners or walls should be positioned 5 cm (a x b x c) from the wall.
  - 1.2 The reference sensor is preferably located of the geometric center of the chamber.
2. Interior dimensions approx of chamber :  
W = 56 cm ; D = 40 cm ; H = 48 cm
3. Air valve or fresh air level : Off
4. Fan level : Open

5. The quoted uncertainty includes "Stability of chamber and loading effect in chamber at 20% of uniformity".

6. 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.

7. Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.

8. Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.

9. UUC' reading - the average reading of indicating device that forms the integral part of the enclosure.

10. Calibration results without adjustment.

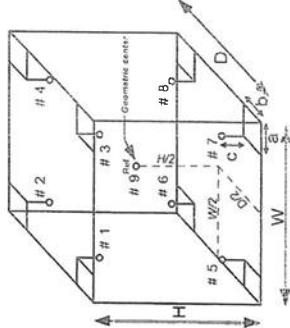


Figure: Example of sensor installation Positions

The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$ , which for a normal distribution corresponds in a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

- End of Report -

COPY

**ORIFICE TRANSFER STANDARD CERTIFICATION**

**WORKSHEET TE-5025A**

**ROOTSMETER S/N 0438320**



TISCH ENVIRONMENTAL, INC.  
145 SOUTH MIAMI AVE  
VILLAGE OF CLEVELAND, OH  
43002  
513.467.9000  
877.263.7610 TOLL FREE  
513.467.9009 FAX

# ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2016 Rootmeter S/N 0438320 Ta (K) - 295  
Operator Tisch Orifice I.D. - 0136 Pa (mm) - 742.95

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORIFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3400	3.2	2.00
2	NA	NA	1.00	0.9510	6.3	4.00
3	NA	NA	1.00	0.8510	7.8	5.00
4	NA	NA	1.00	0.8130	8.6	5.50
5	NA	NA	1.00	0.6690	12.6	8.00

## DATA TABULATION

(x axis)		(y axis)	(x axis)		(y axis)
Vstd	Qstd		Va	Qa	
0.9832	0.7337	1.4054	0.9957	0.7430	0.8911
0.9791	1.0296	1.9875	0.9915	1.0426	1.2603
0.9770	1.1481	2.2221	0.9894	1.1626	1.4090
0.9760	1.2006	2.3305	0.9884	1.2157	1.4778
0.9707	1.4510	2.8107	0.9830	1.4694	1.7823
Qstd slope (m) = 1.96262			Qa slope (m) = 1.22896		
intercept (b) = -0.03249			intercept (b) = -0.02060		
coefficient (r) = 0.99993			coefficient (r) = 0.99993		
Y axis = SQRT [H2O (Pa/760) (298/Ta)]			Y axis = SQRT [H2O (Ta/Pa)]		

## CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m { [SQRT (H2O (Pa/760) (298/Ta)) ] - b }  
Qa = 1/m { [SQRT H2O (Ta/Pa) ] - b }

**COPY**



## **TE-Wilbur Build Checklist**

**TE-PM 2.5C Serial No. 1215-154**

## Test Calibrated Report : TE-Wilbur Calibration Worksheet

Unit Serial Number      0294      NO.      1

TE-PM10-D Serial Number :    2898      TE-PM2.5C Serial Number :    1215-154

Calibrator Make / Model. :    . Delta Cal.DC 1    S/N. 163270    Due Date :    12 March 2028

## Ambient Temperature ( ° C )

As Found	Calibrator Reading	As Left
34.1	33.5	33.4

## Filter Temperature ( ° C )

As Found	Calibrator Reading	As Left
32.2	33.3	33.3

## Barometric Pressure ( mmHg )

As Found	Calibrator Reading	As Left
751.5	754.5	754.7

## Flow Calibration ( Liters Per Minute )

	As Found	Calibrator Reading	As Left
Slope :      0.779	1      14.78	14.81	15.00
	2      15.79	15.83	15.83
	3      16.88	16.85	16.66
	4      19.05	18.60	18.31
Intercept :      3.567			
R factor :      0.99974			

## Set Point      As Found

Calibration Verification :      16.67      16.66

## Leak Check Results

Leak Check Internal Pressure :      225.9      ( inches of H<sub>2</sub>O )

Leak Check External Pressure      180.9      ( inches of H<sub>2</sub>O )

Leak Check Pass / Fail      Pass ☒      Fail ☐

**COPY**

Calibrated By :

Date :    3/4/2025

**TE-Wilbur Build Checklist**  
**TE-PM 2.5C Serial No. 1215-158**

## Test Calibrated Report : TE-Wilbur Calibration Worksheet

Unit Serial Number 0298

NO. 2

TE-PM10-D Serial Number : 2902

TE-PM2.5C Serial Number : 1215-158

Calibrator Make / Model. : Delta Cal.DC 1

S/N. 163270

Due Date : 12 March 2028

## Ambient Temperature ( ° C )

As Found

Calibrator Reading

As Left

33.0

33.9

33.5

## Filter Temperature ( ° C )

As Found

Calibrator Reading

As Left

32.9

33.4

33.0

## Barometric Pressure ( mmHg )

As Found

Calibrator Reading

As Left

750.9

755.7

755.3

## Flow Calibration ( Liters Per Minute )

As Found

Calibrator Reading

As Left

1

14.39

15.00

15.03

Slope : 0.919

2

15.29

15.88

15.86

Intercept : 1.343

3

16.32

16.54

16.66

R factor : 0.99776

4

18.24

18.63

18.35

Set Point

As Found

Calibration Verification :

16.67

16.67

## Leak Check Results

Leak Check Internal Pressure : 276.3 ( inches of H<sub>2</sub>O )Leak Check External Pressure 274.9 ( inches of H<sub>2</sub>O )

Leak Check Pass / Fail

Pass



Fail



COPY

Calibrated By :

Date : 3/4/2025



**TE-Wilbur Build Checklist**

**TE-PM 2.5C Serial No. 1215-165**

## Test Calibrated Report : TE-Wilbur Calibration Worksheet

Unit Serial Number 0305

NO. 3

TE-PM10-D Serial Number : 2909

TE-PM2.5C Serial Number : 1215-165

Calibrator Make / Model. : Delta Cal.DC 1

S/N. 163270

Due Date : 12 March 2028

## Ambient Temperature ( ° C )

As Found

Calibrator Reading

As Left

33.0

33.9

33.6

## Filter Temperature ( ° C )

As Found

Calibrator Reading

As Left

33.5

33.5

32.8

## Barometric Pressure ( mmHg )

As Found

Calibrator Reading

As Left

751.3

754.8

755.9

## Flow Calibration ( Liters Per Minute )

As Found

Calibrator Reading

As Left

1

14.90

14.93

15.03

Slope : 0.798

2

15.88

15.83

15.80

Intercept : 3.634

3

16.92

16.85

16.68

R factor : 0.99981

4

19.27

19.05

18.37

Set Point

As Found

Calibration Verification :

16.67

16.67

## Leak Check Results

Leak Check Internal Pressure :

234.6

( inches of H<sub>2</sub>O )

Leak Check External Pressure

205.3

( inches of H<sub>2</sub>O )

Leak Check Pass / Fail

Pass



Fail



COPY

Calibrated By :

Date : 3/4/2025

**TE-Wilbur Build Checklist**  
**TE-PM 2.5C Serial No. 1215-198**

## Test Calibrated Report : TE-Wilbur Calibration Worksheet

Unit Serial Number 0341

NO. 4

TE-PM10-D Serial Number : 3028

TE-PM2.5C Serial Number : 1215-198

Calibrator Make / Model. : Delta Cal.DC 1

S/N. 163270

Due Date : 12 March 2028

## Ambient Temperature ( ° C )

As Found

Calibrator Reading

As Left

31.9

32.8

32.7

## Filter Temperature ( ° C )

As Found

Calibrator Reading

As Left

32.0

32.5

32.3

## Barometric Pressure ( mmHg )

As Found

Calibrator Reading

As Left

750.9

754.8

755.1

## Flow Calibration ( Liters Per Minute )

As Found

Calibrator Reading

As Left

1

14.58

14.99

15.01

Slope : 0.885

2

15.67

15.75

15.81

Intercept : 2.365

3

16.73

16.68

16.68

R factor : 0.99966

4

18.84

18.77

18.35

Set Point

As Found

Calibration Verification :

16.67

16.69

## Leak Check Results

Leak Check Internal Pressure : 230.5 ( inches of H<sub>2</sub>O )Leak Check External Pressure 221.4 ( inches of H<sub>2</sub>O )

Leak Check Pass / Fail

Pass



Fail



COPY

Calibrated By :

Date : 3/4/2025



**THERMO-HYGROMETER**

**Model : 608-H1**

**Serial No. : 45106737**



## CERTIFICATE OF CALIBRATION

Certificate No. : 25-090091  
Sample Code : 25-39161-001Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhapibarn 8 Rd., Nongkham,  
Siracha, Chonburi 20230Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited  
(Calibration laboratory)

Equipment : Digital thermo-hygrometer

Manufacturer : testo Model : 608-H1

Serial No. : 45106737 ID No. : LABE 09/7

Date of Receipt : 21 May 2025 Date of Calibration : 23 May 2025

## Condition of Calibration

1. Environment 1.1 Ambient temperature : 23.0 °C ± 3.0 °C  
1.2 Relative humidity : 55.0 % ± 15.0 %

## 2. Calibration method

2.1 In-house method: WI-CL-045 By comparison with thermometer standard / chilled mirror hygrometer in controlled chamber.  
2.2 The calibration by comparison unit under calibration (UUC) to the thermometer standard / chilled mirror hygrometer in a chamber at the controlled temperature / relative humidity.

## 3. Reference standard instrument

Instrument	Model	ID No.	Certificate No.	Due Date
3.1 Chilled Mirror	Oxidew 401	LB DP-03 & LB DP-03 (DP)	TH 0122-24	25 September 2025
3.2 Digital Thermometer	Oxidew 401	LB DP-03 & LB DP-03 (Temp.)	24-138856	28 October 2025
3.3 Digital Thermometer	34972A	LB-DA-07 with RTD-89	24-106857	21 August 2025

4. This certificate is traceable to the international system of unit (SI Unit).

4.1 Instrument No. 3.1 through National Institute of Metrology (Thailand).

4.2 Instrument No. 3.2 and 3.3 through Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of calibration item : Normal

Calibrated by

Miss Pornsuda Lohabai

Approved by

(Mr. Somchai Neampunt)

Issue date

26 May 2025

Signed for Director

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

361 Soi Ladprao 122, Ladprao Road,  
Phialapha, Wang Thonglang, Bangkok 10310  
TEL 02-516-2422 FAX 02-516-6949  
Rev 01CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21

## REPORT OF CALIBRATION

Page 2 of 2  
Certificate No. : 25-090091  
Sample Code : 25-39161-001

## Results of Calibration

## Temperature measurement

Resolution : 0.1 °C  
Range : 0 °C to 50 °C

Calibration point °C	Average of standard reading		Unit under calibration		uncertainty °C
	Controlled humidity %RH	Temperature °C	Average reading °C	Correction value °C	
20	50	20.01	20.2	- 0.19	± 0.39
25	50	25.01	25.0	+ 0.01	± 0.39
30	50	30.01	30.0	+ 0.01	± 0.39

## Humidity measurement

Resolution : 0.1 %RH  
Range : 10 %RH to 95 %RH

Calibration point %RH	Average of standard reading		Unit under calibration		uncertainty %RH
	Air temperature °C	Calculated humidity %RH	Average reading %RH	Correction value %RH	
45	25.02	45.10	50.2	- 5.10	± 1.3
60	25.02	60.15	65.2	- 5.05	± 1.5
75	25.02	75.01	82.1	- 7.09	± 1.7

## Notes

Calibration results without adjustment.

The result expanded uncertainty of measurement U is stated as the standard uncertainty multiplied by the coverage factor k=2.00, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003.

- End of Report -

COPY

361 Soi Ladprao 122, Ladprao Road,  
Phialapha, Wang Thonglang, Bangkok 10310  
TEL 02-516-2422 FAX 02-516-6949  
Rev 09  
CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21

**SOUND LEVEL CALIBRATOR**

**MODEL : NC-75**

**SERIAL No. : 34302326**

## Calibration Certificate

Cert. No. : ACC25018  
Pages : 1 of 3

**Equipment :** SOUND CALIBRATOR  
**Manufacturer :** RION  
**Model :** NC-75  
**Serial No.:** 34302326  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 02 APRIL 2025  
**Calibration Date :** 30 APRIL 2025  
**Date of Issue :** 02 MAY 2025

**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-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-0012-25	11-FEB-26
Digital Multimeter	33461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26
Audio Analyzer	AVR-3360A	V744B6069	EF-0013-25	13-FEB-26

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 Electrical And Electronics Institute (EEI).

COPY

T. Petch.



Cert. No. : ACC25018  
Job No. : VC68AC0077  
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	94.03	0.03	0.15	0.40

**2. Frequency**

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Acceptance limit (%)
1000	1000.0	0.0	0.1	1.0

**3. Total distortion**

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
0.79	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

**COPY**

*T. Petch*

**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 01120952**

Cert. No. : ACL25058  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 01120952 / 22709 / 22427  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 06 JANUARY 2025  
**Calibration Date :** 15 - 16 JANUARY 2025  
**Date of Issue :** 17 JANUARY 2025

**Calibrated by :** Nathakorn Pisunpaisan

**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. : ACL25058  
Job No. : VC68AC0048  
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	MY523202742	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).

  
ISO 17025  
CALIBRATION 1994

  
ISO 17025  
CALIBRATION 1994

  
( Thanakul Petchurai )

Cert. No. : ACL25058  
Job No. : VC68AC0048  
Pages : 3 of 8

Cert. No. : ACL25058  
Job No. : VC68AC0048  
Page : 4 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

### Result of Calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	94.0	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value (dB)
14.2

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

Frequency Weighting	Weighting (dB)
A - weight	10.8
C - weight	15.8
Flat	21.4

#### 3. Acoustical signal tests of frequency weightings

Metre 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
125	0.3	0.3	0.3
1000	0.3	0.3	0.3
10000	0.8	0.8	0.8
			Acceptance Limits
			± 1.0
			± 0.7
			+ 1.5, - 2.5

COPY

T. K. K.

COPY

T. K. K.



Cert. No. : ACL25058  
Job No. : VC68AC0048  
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
63	-0.1	0.0	0.0
125	0.0	0.0	-0.1
250	0.0	-0.1	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.0	0.1
16000	0.0	-1.2	-1.2
			+ 2.5, -16.0

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

5.1 Frequency weightings at 1 kHz

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

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

#### 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	$\pm 0.1$

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

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 0.8$
136.0	136.0	0.0	$\pm 0.8$
135.0	135.0	0.0	$\pm 0.8$
134.0	134.0	0.0	$\pm 0.8$
133.0	133.0	0.0	$\pm 0.8$
132.0	131.9	-0.1	$\pm 0.8$
131.0	130.9	-0.1	$\pm 0.8$
129.0	129.0	0.0	$\pm 0.8$
124.0	124.0	0.0	$\pm 0.8$
119.0	119.0	0.0	$\pm 0.8$
114.0	114.0	0.0	$\pm 0.8$
109.0	109.0	0.0	$\pm 0.8$
104.0	104.0	0.0	$\pm 0.8$
99.0	99.0	0.0	$\pm 0.8$
94.0	94.0	0.0	$\pm 0.8$
89.0	89.0	0.0	$\pm 0.8$
84.0	84.0	0.0	$\pm 0.8$
79.0	79.0	0.0	$\pm 0.8$
74.0	74.0	0.0	$\pm 0.8$
69.0	69.0	0.0	$\pm 0.8$
64.0	64.0	0.0	$\pm 0.8$
59.0	59.0	0.0	$\pm 0.8$
54.0	54.0	0.0	$\pm 0.8$
49.0	49.0	0.0	$\pm 0.8$
44.0	44.0	0.0	$\pm 0.8$
39.0	39.0	0.0	$\pm 0.8$
34.0	34.0	0.0	$\pm 0.8$
30.0	30.0	0.0	$\pm 0.8$
29.0	29.0	0.0	$\pm 0.8$
28.0	28.0	0.0	$\pm 0.8$
27.0	27.0	0.0	$\pm 0.8$
26.0	26.0	0.0	$\pm 0.8$
25.0	25.0	0.0	$\pm 0.8$

COPY

T. Petch.

COPY

T. Petch.

Cert. No. : ACL25058  
Job No. : VC68AC0048  
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	±0.8

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±0.8

## 9. Tone burst response

Time Weighting	Tone burst duration, T <sub>b</sub> (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

Cert. No. : ACL25058  
Job No. : VC68AC0048  
Pages : 7 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	±2.0
C <sub>2</sub>	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

## 11. Overload indication

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

## 12. High level ability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

COPY

T. Petcha.

T. Petcha.

**SOUND LEVEL METER**

**MODEL : NL-53**

**SERIAL No. : 00741219**



## Calibration Certificate

Cert. No. : ACL25312  
Pages : 1 of 8

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-53 / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 00741219 / 26159 / 34174  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 23 JULY 2025  
**Calibration Date :** 13 - 14 AUGUST 2025  
**Date of Issue :** 15 AUGUST 2025

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :** *Wichon E.*  
( Wichok Ekpongpradit )

**Calibration Procedure :** CP-AC-02

### 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL.BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL.BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	ET-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

**COPY**

**COPY**



Cert. No. : ACL25312  
Job No. : VC68AC0160  
Pages : 3 of 8

Cert. No. : ACL25312  
Job No. : VC68AC0160  
Page : 4 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

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	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	12.1
C - weight	16.0
Flat	21.5

**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 Limits
125	0.1	0.1	± 1.0
1000	0.1	0.1	± 0.7
8000	-0.8	-0.7	+ 1.5, - 2.5

COPY

COPY

Cert No. : ACL25312

Job No. : VC68AC0160

Pages : 5 of 8

Cert No. : ACL25312

Job No. : VC68AC0160

Pages : 6 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	±1.0
125	0.1	0.1	±1.0
250	0.1	0.0	±1.0
500	0.1	0.1	±1.0
1000	0.0	0.0	±1.0
2000	0.0	0.1	±1.0
4000	0.0	0.0	±1.0
8000	0.0	0.0	+ 1.5, - 2.5
16000	0.0	-0.7	+ 2.5, -16.0

## 5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	93.9	-0.1	± 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	93.9	94.0	0.1	± 0.1

## 7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	38.9	-0.1	±0.8
34.0	34.0	0.0	±0.8
30.0	29.9	-0.1	±0.8
29.0	28.9	-0.1	±0.8
28.0	27.9	-0.1	±0.8
27.0	26.9	-0.1	±0.8
26.0	25.9	-0.1	±0.8
25.0	25.0	0.0	±0.8

COPY

COPY

Cert. No. : ACL25312  
Job No. : VC68AC0160  
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	±0.8

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

Cert. No. : ACL25312  
Job No. : VC68AC0160  
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	±2.0
One	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.1	-0.3	±1.0

**11. Overload indication**

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

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

COPY

**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 01120946**



Cert. No. : ACL25301  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25  
Serial No.: 01120946 / 21952 / 22335  
ID No.:

Condition As Found : GOOD

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

Received Date : 14 JULY 2025  
Calibration Date : 04 AUGUST 2025  
Date of Issue : 06 AUGUST 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by :  
*Wichon Ek*  
( Wichok Ekpongpradit )

COPY

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. : ACL25301  
Job No. : VC68AC0154  
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 Calibration Certificate

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120E/A	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

COPY

Cert. No. : ACL25301  
Job No. : VC68AC0154  
Pages : 3 of 8

Cert. No. : ACL25301  
Job No. : VC68AC0154  
Page : 4 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

**Result of Calibration :**

**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.1 (93.94)	94.0	0.0	±0.2

**2. Self-generated noise**

2.1 Normal test

Measured Value (dB)
14.4

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

Frequency Weighting (dB)	Weighting (dB)
A-weight	11.6
C-weight	16.1
Flat	21.3

**3. Acoustical signal tests of frequency weightings**

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
125	0.1	0.2	0.2
1000	0.1	0.1	0.1
8000	0.9	0.9	0.9
			Acceptance Limits
			±1.0
			±0.7
			±1.5, -2.5

COPY

COPY

Cert. No. : ACL25301

Job No. : VC68AC0154

Pages : 5 of 8

Cert. No. : ACL25301

Job No. : VC68AC0154

Pages : 6 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
63	-0.1	-0.1	-0.1
125	-0.1	0.0	0.0
250	0.0	0.0	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.0	0.0
16000	0.0	-1.2	-1.2

## 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

## 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	$\pm 0.1$

## 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 0.8$
136.0	136.1	0.1	$\pm 0.8$
135.0	135.1	0.1	$\pm 0.8$
134.0	134.1	0.1	$\pm 0.8$
133.0	133.0	0.0	$\pm 0.8$
132.0	132.0	0.0	$\pm 0.8$
131.0	131.0	0.0	$\pm 0.8$
129.0	129.1	0.1	$\pm 0.8$
124.0	124.0	0.0	$\pm 0.8$
119.0	119.1	0.1	$\pm 0.8$
114.0	114.1	0.1	$\pm 0.8$
109.0	109.1	0.1	$\pm 0.8$
104.0	104.1	0.1	$\pm 0.8$
99.0	99.1	0.1	$\pm 0.8$
94.0	94.0	0.0	$\pm 0.8$
89.0	89.0	0.0	$\pm 0.8$
84.0	84.0	0.0	$\pm 0.8$
79.0	79.0	0.0	$\pm 0.8$
74.0	74.0	0.0	$\pm 0.8$
69.0	69.0	0.0	$\pm 0.8$
64.0	64.0	0.0	$\pm 0.8$
59.0	59.0	0.0	$\pm 0.8$
54.0	54.0	0.0	$\pm 0.8$
49.0	49.0	0.0	$\pm 0.8$
44.0	44.0	0.0	$\pm 0.8$
39.0	39.0	0.0	$\pm 0.8$
34.0	34.0	0.0	$\pm 0.8$
30.0	30.0	0.0	$\pm 0.8$
29.0	29.0	0.0	$\pm 0.8$
28.0	28.0	0.0	$\pm 0.8$
27.0	27.0	0.0	$\pm 0.8$
26.0	26.1	0.1	$\pm 0.8$
25.0	25.1	0.1	$\pm 0.8$

COPY

COPY

Cert. No. : ACL25301  
Job No. : VC68AC0154  
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	±0.8

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	116.9	-0.1	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

Cert. No. : ACL25301  
Job No. : VC68AC0154  
Pages : 8 of 8

**10. Peak to average ratio**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, 1 peak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±2.0
One	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

**11. Overload indication**

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

**12. High level stability**

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weighting	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

COPY



**SOUND LEVEL METER**

**MODEL : NL-53**

**SERIAL No. : 00741218**



Cert. No. : ACL25311  
 Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER

**Manufacturer :** RION

**Model :** NL-53 / Microphone UC-59 / Preamplifier NH-25

**Serial No.:** 00741218 / 25794 / 34173

**ID No.:**

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
 SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
 NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 23 JULY 2025  
**Calibration Date :** 13 - 14 AUGUST 2025  
**Date of Issue :** 15 AUGUST 2025

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :** *Wichok E.*  
 ( Wichok Ekpongpradit )

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.

**COPY**

Cert. No. : ACL25311  
 Job No. : VC68AC0160  
 Pages : 2 of 8

**Calibration Procedure :** CP-AC-02

### 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAJ	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

**COPY**

Cert. No. : ACL25311  
Job No. : VC68AC0160  
Pages : 3 of 8

Cert. No. : ACL25311  
Job No. : VC68AC0160  
Page : 4 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

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	0.0	$\pm 0.3$

**2. Self-generated noise****2.1 Normal test**

Measured Value ( dB )
15.4

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

Frequency Weighting	Weighting ( dB )
A - weight	13.0
C - weight	17.0
Flat	22.5

**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
125	0.3	0.3	0.3
1000	0.2	0.2	0.2
8000	-0.2	-0.2	-0.1
Acceptance Limits			$\pm 1.0$
			$\pm 0.7$
			$+ 1.5, - 2.5$

COPY

COPY

Cert. No. : ACL25311

Job No. : VC68AC0160

Pages : 5 of 8

Cert. No. : ACL25311

Job No. : VC68AC0160

Pages : 6 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	±1.0
125	0.0	0.0	±1.0
250	0.0	0.0	±1.0
500	0.0	0.0	±1.0
1000	0.0	0.0	±1.0
2000	0.0	0.1	±1.0
4000	0.0	0.0	±1.0
8000	-0.1	0.0	+ 1.5, - 2.5
16000	0.0	-0.8	+ 2.5, -16.0

## 5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

## 6. Long - term stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.1

## 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	29.0	0.0	±0.8
28.0	28.0	0.0	±0.8
27.0	26.9	-0.1	±0.8
26.0	26.0	0.0	±0.8
25.0	25.0	0.0	±0.8

COPY

Wichou B.

Wichou B.



Cert. No. : ACL25311  
Job No. : VC68AC0160  
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	±0.8

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, T <sub>b</sub> ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	116.9	-0.1	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lepeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	130.0	130.0	0.0	±2.0
One	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

**11. Overload indication**

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

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

COPY

End of Calibration Certificate

COPY

**SOUND LEVEL METER**

**MODEL : NL-53**

**SERIAL No. : 00741217**

Cert. No. : ACL25310  
Pages : 1 of 8

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-53 / Microphone UC-59 / Preamplifier NH-25  
Serial No.: 00741217 / 25793 / 34172  
ID No.:

Condition As Found : GOOD

Customer :  
EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

Received Date : 23 JULY 2025  
Calibration Date : 13 - 14 AUGUST 2025  
Date of Issue : 15 AUGUST 2025

Calibrated by : Nahaikom Pisutpaisan

Approved by : *Wichon B.*  
( Wichok Ekpongpradit )

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 2 of 8  
Calibration Procedure : CP-AC-02

## 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL-BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL-BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

COPY

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.

COPY

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 3 of 8

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Page : 4 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

COPY

mic/004 B2

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB )	Measured Value (dB )	Deviation (dB )	Acceptance Limit (dB )
93.9 (93.94)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB )
15.4

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

Frequency Weighting	Weighting (dB )
A - weight	13.0
C - weight	16.8
Flat	22.3

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz )	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
125	0.2	0.2	0.2
1000	0.2	0.2	0.2
8000	-0.4	-0.3	-0.3
			Acceptance Limits
			± 1.0
			± 0.7
			+ 1.5, - 2.5

COPY

mic/004 B2



Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 5 of 8

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 6 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
63	0.1	0.0	0.0
125	0.0	0.0	0.0
250	0.0	0.0	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	-0.1	-0.1	-0.1
8000	-0.1	-0.1	-0.1
16000	-0.1	-0.8	-0.8

#### 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

#### 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	$\pm 0.1$

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

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 0.8$
136.0	136.0	0.0	$\pm 0.8$
135.0	135.0	0.0	$\pm 0.8$
134.0	134.0	0.0	$\pm 0.8$
133.0	133.0	0.0	$\pm 0.8$
132.0	132.0	0.0	$\pm 0.8$
131.0	131.0	0.0	$\pm 0.8$
129.0	129.0	0.0	$\pm 0.8$
124.0	124.0	0.0	$\pm 0.8$
119.0	119.0	0.0	$\pm 0.8$
114.0	114.0	0.0	$\pm 0.8$
109.0	109.0	0.0	$\pm 0.8$
104.0	104.0	0.0	$\pm 0.8$
99.0	99.0	0.0	$\pm 0.8$
94.0	94.0	0.0	$\pm 0.8$
89.0	89.0	0.0	$\pm 0.8$
84.0	84.0	0.0	$\pm 0.8$
79.0	79.0	0.0	$\pm 0.8$
74.0	74.0	0.0	$\pm 0.8$
69.0	69.0	0.0	$\pm 0.8$
64.0	64.0	0.0	$\pm 0.8$
59.0	59.0	0.0	$\pm 0.8$
54.0	54.0	0.0	$\pm 0.8$
49.0	49.0	0.0	$\pm 0.8$
44.0	44.0	0.0	$\pm 0.8$
39.0	39.0	0.0	$\pm 0.8$
34.0	34.0	0.0	$\pm 0.8$
30.0	30.0	0.0	$\pm 0.8$
29.0	28.9	-0.1	$\pm 0.8$
28.0	28.0	0.0	$\pm 0.8$
27.0	26.9	-0.1	$\pm 0.8$
26.0	25.9	-0.1	$\pm 0.8$
25.0	24.9	-0.1	$\pm 0.8$

COPY

COPY

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 7 of 8

Cert. No. : ACL25310  
Job No. : VC68AC0160  
Pages : 8 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	±0.8

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>peak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	130.0	130.0	0.0	±2.0
One	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

**11. Overload indication**

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

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

COPY

**SOUND LEVEL CALIBRATOR**

**MODEL : NC-75**

**SERIAL No. : 34302326**



Cert. No. : ACC25018  
Pages : 1 of 3

## Calibration Certificate

**Equipment :** SOUND CALIBRATOR  
**Manufacturer :** RION  
**Model :** NC-75  
**Serial No.:** 34302326  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 30230 THAILAND.

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

**Received Date :** 02 APRIL 2025  
**Calibration Date :** 30 APRIL 2025  
**Date of Issue :** 02 MAY 2025

**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.

COPY

Cert. No. : ACC25018  
Job No. : VC68AC0077  
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-0012-25	11-FEB-26
Digital Multimeter	33461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26
Audio Analyzer	AYR-3360A	V744B6069	EF-0013-25	13-FEB-26

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 Electrical And Electronics Institute (EEI).

COPY

T. Petch.



Cert. No. : ACC25018  
Job No. : VC68ACM077  
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	94.03	0.03	0.15	0.40

**2. Frequency**

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Acceptance limit (%)
1000	1000.0	0.0	0.1	1.0

**3. Total distortion**

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
0.79	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

**COPY**

*T. Petch.*

**SOUND LEVEL METER**

**MODEL : NL-53**

**SERIAL No. : 00741219**

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-53 / Microphone UC-59 / Preamplifier NH-25  
Serial No.: 00741219 / 26159 / 34174  
ID No.:

Condition As Found : GOOD

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

Received Date : 23 JULY 2025  
Calibration Date : 13 - 14 AUGUST 2025  
Date of Issue : 15 AUGUST 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by : *Wichon B.*  
( Wichok Ekpongpradit )

Cert. No. : ACL25312  
Pages : 1 of 8

Cert. No. : ACL25312  
Job No. : VC68AC0160  
Pages : 2 of 8

Calibration Procedure : CP-AC-02

### 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL-BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL-BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

Cert. No. : ACL25312  
Job No. : VC68AC0160  
Pages : 3 of 8

Cert. No. : ACL25312  
Job No. : VC68AC0160  
Page : 4 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

COPY

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	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	12.1
C - weight	16.0
Flat	21.5

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
125	0.1	0.1	0.1
1000	0.1	0.1	0.1
8000	-0.8	-0.7	-0.7
			Acceptance Limits
			± 1.0
			± 0.7
			+ 1.5, - 2.5

COPY



Cert. No. : ACL25312  
Job No. : VC68AC0160  
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	±1.0
125	0.1	0.1	±1.0
250	0.1	0.0	±1.0
500	0.1	0.1	±1.0
1000	0.0	0.0	±1.0
2000	0.0	0.1	±1.0
4000	0.0	0.0	±1.0
8000	0.0	0.0	±1.0
16000	0.0	-0.7	+ 1.5, - 2.5 + 2.5, -16.0

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

**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	93.9	-0.1	± 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	93.9	94.0	0.1	± 0.1

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

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	38.9	-0.1	±0.8
34.0	34.0	0.0	±0.8
30.0	29.9	-0.1	±0.8
29.0	28.9	-0.1	±0.8
28.0	27.9	-0.1	±0.8
27.0	26.9	-0.1	±0.8
26.0	25.9	-0.1	±0.8
25.0	25.0	0.0	±0.8

COPY

COPY

Cert. No. : ACL25312  
Job No. : VC68AC0160  
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	±0.8

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

Cert. No. : ACL25312  
Job No. : VC68AC0160  
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	±2.0
Cnc	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.1	-0.3	±1.0
Negative half cycle	135.4	135.1	-0.3	±1.0

**11. Overload indication**

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

**12. High level stability**

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

COPY

**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 00230985**

## Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-52A / Microphone UC-59 / Preamplifier NH-25  
Serial No. : 00230985 / 22118 / 22421  
ID No. :

Condition As Found : GOOD

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

Received Date : 06 JANUARY 2025  
Calibration Date : 15 - 16 JANUARY 2025  
Date of Issue : 17 JANUARY 2025

Calibrated by : Nathakorn Pisupaisan

Approved by :  
T. Petchurai  
( Thanakul Petchurai )

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

COPY

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).

COPY

T. Petchurai



Cert. No. : ACL25048  
Job No. : VC68AC0048  
Pages : 3 of 8

Cert. No. : ACL25048  
Job No. : VC68AC0048  
Page : 4 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

**COPY**  
T. Petcha

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	94.0	0.0	±0.3

**2. Self-generated noise****2.1 Flat normal test**

Measured Value (dB)
14.1

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	14.5
Flat	19.9

**3. Acoustical signal tests of frequency weightings**

Note: 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
125	0.3	0.3	0.3
1000	0.3	0.3	0.3
10000	0.5	0.5	0.5
			Acceptance Limits
			± 1.0
			+ 0.7
			+ 1.5, - 2.5

**COPY**  
T. Petcha

Cert. No. : ACL25048  
Job No. : VC68AC0048  
Pages : 5 of 8

Cert. No. : ACL25048  
Job No. : VC68AC0048  
Pages : 6 of 8

#### 4. Electrical signal tests of frequency weightings

Weighing 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
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1
16000	0.0	-1.2	-1.2

#### 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

#### 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	$\pm 0.1$

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

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	$\pm 0.8$
136.0	136.0	0.0	$\pm 0.8$
135.0	135.0	0.0	$\pm 0.8$
134.0	134.0	0.0	$\pm 0.8$
133.0	133.0	0.0	$\pm 0.8$
132.0	132.0	0.0	$\pm 0.8$
131.0	131.0	0.0	$\pm 0.8$
129.0	129.0	0.0	$\pm 0.8$
124.0	124.0	0.0	$\pm 0.8$
119.0	119.0	0.0	$\pm 0.8$
114.0	114.0	0.0	$\pm 0.8$
109.0	109.0	0.0	$\pm 0.8$
104.0	104.0	0.0	$\pm 0.8$
99.0	99.0	0.0	$\pm 0.8$
94.0	94.0	0.0	$\pm 0.8$
89.0	89.0	0.0	$\pm 0.8$
84.0	83.9	-0.1	$\pm 0.8$
79.0	78.9	-0.1	$\pm 0.8$
74.0	74.0	0.0	$\pm 0.8$
69.0	68.9	-0.1	$\pm 0.8$
64.0	63.9	-0.1	$\pm 0.8$
59.0	58.9	-0.1	$\pm 0.8$
54.0	53.9	-0.1	$\pm 0.8$
49.0	48.9	-0.1	$\pm 0.8$
44.0	43.9	-0.1	$\pm 0.8$
39.0	38.9	-0.1	$\pm 0.8$
34.0	33.9	-0.1	$\pm 0.8$
30.0	29.9	-0.1	$\pm 0.8$
29.0	28.9	-0.1	$\pm 0.8$
28.0	27.9	-0.1	$\pm 0.8$
27.0	26.9	-0.1	$\pm 0.8$
26.0	26.0	0.0	$\pm 0.8$
25.0	24.9	-0.1	$\pm 0.8$

COPY

Z. Petcha-

COPY

Z. Petcha-

Cert. No. : ACL25048  
Job No. : VC68AC0048  
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	$\pm 0.8$

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	$\pm 0.8$

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	$\pm 0.5$
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	$\pm 0.5$
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	$\pm 0.5$

**COPY**

T. Retan

Cert. No. : ACL25048  
Job No. : VC68AC0048  
Pages : 8 of 8

**10. Peak C sound level**

Number of cycle	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
test : signal Continuous	130.0	130.0	0.0	$\pm 2.0$
Off	133.4	133.3	-0.1	$\pm 2.0$

Number of cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
test : signal Continuous	133.0	132.9	-0.1	$\pm 1.0$
Positive half cycle	135.4	135.1	-0.3	$\pm 1.0$
Negative half cycle	135.4	135.1	-0.3	$\pm 1.0$

**11. Overload indication**

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle		
89.6	89.4	-0.2
		$\pm 1.5$

**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	$\pm 0.1$

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

**End of Calibration Certificate****COPY**  
T. Retan

**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 01120952**



## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 01120952 / 22709 / 22427  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 06 JANUARY 2025  
**Calibration Date :** 15 - 16 JANUARY 2025  
**Date of Issue :** 17 JANUARY 2025

**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.

**COPY**

**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 Auechoic 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).

**COPY**



Cert. No. : ACL25058  
Job No. : VC68AC0048  
Pages : 3 of 8

Cert. No. : ACL25058  
Job No. : VC68AC0048  
Page : 4 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

**COPY**

Z. Petch

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal (dB )	Measured Value (dB )	Deviation (dB )	Acceptance Limit (dB )
93.9 (93.94)	94.0	0.0	±0.3

**2. Self-generated noise****2.1 Normal test**

Measured Value (dB )
14.2

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

Frequency Weighting	Weighting (dB )
A - weight	10.8
C - weight	15.8
Flat	21.4

**3. Acoustical signal tests of frequency weightings**

Met 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
125	0.3	0.3	0.3
1000	0.3	0.3	0.3
8000	0.8	0.8	0.8
			Acceptance Limits
			± 1.0
			± 0.7
			+ 1.5, - 2.5

**COPY**

Z. Petch

Cert. No. : ACL25058  
Job No. : VC68AC0048  
Pages : 5 of 8

#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight Acceptance Limits
63	-0.1	0.0	±1.0
125	0.0	0.0	±1.0
250	0.0	-0.1	±1.0
500	0.0	0.0	±1.0
1000	0.0	0.0	±1.0
2000	0.0	0.0	±1.0
4000	0.0	0.0	±1.0
8000	0.0	0.0	+1.5, -2.5
16000	0.0	-1.2	+2.5, -16.0

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

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	±0.1

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

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	131.9	-0.1	±0.8
131.0	130.9	-0.1	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	29.0	0.0	±0.8
28.0	28.0	0.0	±0.8
27.0	27.0	0.0	±0.8
26.0	26.0	0.0	±0.8
25.0	25.0	0.0	±0.8

COPY

T. Petch.

COPY

T. Petch.

Cert. No. : ACL25058  
Job No. : VC68AC0048  
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	±0.8

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.0; -3.0
	2	8	117.0	117.0	0.0	1.0; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0; -3.0
	2	8	108.0	108.0	0.0	1.0; -1.5
	200	800	128.0	128.0	0.0	±0.5

COPY

T. Petcha-

Cert. No. : ACL25058  
Job No. : VC68AC0048  
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	±2.0
Once	133.4	133.4	0.0	±2.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

**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 ability**

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

COPY

T. Petcha-



**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 00230986**

## Certificate of Calibration

Certificate No.: S2502-1002

### Customer:

EASTERN THAI CONSULTING 1992 CO.,LTD.  
683 Moo 11, Sukhapibarn 8 Rd,  
Nongkham, Sriracha, Chonburi 20230

### Date of calibration:

2025-02-28

### Date of issue:

2025-03-03

### Instrument calibrated:

Sound Level Meter

### Manufacturer:

Rion

### Model:

NL-52A ( Meter), NI-25 (Preamplifier), UC-59 (Microphone)

### Serial number:

00230986 (Meter), 22334 (Preamplifier), 21951 (Microphone)

### Calibration and verification performed:

Acoustical levels are stated relative to 20µPa. Other dB levels are relative values.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k, which with the reported effective degree of freedom corresponds to coverage probability of approximately 95%.

The sound level meter instrument submitted for periodic testing following the periodic tests of IEC 61672-3 : 2013.

### Preconditioning:

The equipment was preconditioned for more than 16 hours at the specified calibration temperature and humidity.

### Instruments and Program:

A complete list of instruments, hardware, and software, that has been used for this calibration is separately available from the calibration laboratory.

### Equipment standards used:

- Sound measuring equipment calibration unit 483 B S/N31083
- Digital multimeter Keysight S/N HP34401A
- Ultra-low distortion function generator Stanford SRS DS360 S/N123625
- Acoustic sound calibrator class 1 Nor1256 S/N125626542
- Combined Pressure, Humidity and Temperature Transmitter PTU300 S/NM2520568

### Traceability

The measured values are traceable to following the ISO/IEC 17025 laboratories:

Sound Pressure Level: EEI, Thailand

Reference Pressure, Humidity and Temperature: TPA, Thailand

Voltage: TPA, Thailand

Frequency: TPA, Thailand

This certificate of calibration is issued by Acoustic Laboratory Thailand (ALT). It also states that the laboratory has a satisfactory quality assurance system and traceability to accredited or national calibration laboratories. This certificate may not be reproduced other than in full.

COPY

Certificate No.: S2502-1002

### Environmental conditions:

Reference conditions: Pressure: 101.325 kPa

Temperature: 23.0 °C

Measurement conditions: 101.31 ± 0.10 kPa

22.2 ± 1.0 °C

Relative humidity: 50 %RH

52.8 ± 2.0 %RH

### 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)		Deviated value (dB)	Acceptance limit (dB)
	Before adjust	After adjust		
94.0	94.4	94.0	0.0	±0.7

Note: Indication at the checked calibration frequency was adjusted to 94.0 dB by the sound calibrator

### 2. Self-generated noise

Frequency weightings		Measured value (dB)
A-Weighting	C-Weighting	
11.4	15.4	20.9

### 3. Electrical signal test of frequency weighting at 93 dB

Nominal Frequency (Hz)	Deviation from various frequency weighting response curve		
	A-Weighting (dB)	C-Weighting (dB)	Z-Weighting (dB)
63	-0.2	0.0	0.0
125	-0.1	0.0	0.0
250	-0.1	0.0	0.0
500	-0.1	0.1	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.1	0.0
8000	0.1	0.1	0.1
16000	-1.2	-1.1	0.1

Date of calibration : 2025-02-28

Date of issue : 2025-03-03

COPY

4. Frequency and time weighting at 1 kHz

4.1 Frequency weighting at 1 kHz

Frequency weightings	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
A	94.0	0.0	±0.2
C	94.0	0.0	±0.2
Z	94.0	0.0	±0.2

4.2 Time weighting at 1 kHz

Time weightings	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Leq	94.0	0.0	±0.1

5. Long term stability

Time interval (mm:ss)	Start level (dB)	Stop level (dB)	Deviated value (dB)	Acceptance limit (dB)
39:20	94.0	94.0	0.0	±0.1

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

COPY

6. Level linearity in the reference level range

6.1 Measured : 131.5 Hz

Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
84.0	84.0	0.0	±0.8
89.0	89.0	0.0	±0.8
94.6	94.6	0.0	±0.8
95.6	95.6	0.0	±0.8
96.6	96.6	0.0	±0.8
97.6	97.6	0.0	±0.8
98.6	98.6	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.1	0.1	±0.8
44.0	44.1	0.1	±0.8
42.0	42.0	0.0	±0.8
41.0	41.0	0.0	±0.8
40.0	40.0	0.0	±0.8
39.0	39.0	0.0	±0.8
38.0	38.0	0.0	±0.8

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

COPY

Certificate No.: S2502-1002

6.2 Measured at 1 kHz

Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.1	0.1	±0.8
109.0	109.0	0.0	±0.8
114.0	114.1	0.1	±0.8
119.0	119.1	0.1	±0.8
124.0	124.1	0.1	±0.8
129.0	129.1	0.1	±0.8
134.0	134.1	0.1	±0.8
135.0	135.0	0.0	±0.8
136.0	136.0	0.0	±0.8
137.0	137.1	0.1	±0.8
138.0	138.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.1	0.1	±0.8
84.0	84.1	0.1	±0.8
79.0	79.1	0.1	±0.8
74.0	74.1	0.1	±0.8
69.0	69.0	0.0	±0.8
64.0	64.1	0.1	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.1	0.1	±0.8
44.0	44.1	0.1	±0.8
42.0	42.1	0.1	±0.8
41.0	41.1	0.1	±0.8
40.0	40.1	0.1	±0.8
39.0	39.0	0.0	±0.8
38.0	38.0	0.0	±0.8

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

COPY

Certificate No.: S2502-1002

6.3 Measured at 8 kHz

Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
94.0	94.0	0.0	±0.8
99.0	99.1	0.1	±0.8
104.0	104.1	0.1	±0.8
109.0	109.1	0.1	±0.8
114.0	114.1	0.1	±0.8
119.0	119.1	0.1	±0.8
124.0	124.0	0.0	±0.8
129.0	129.1	0.1	±0.8
132.9	133.0	0.1	±0.8
133.9	134.0	0.1	±0.8
134.9	134.9	0.0	±0.8
135.9	135.9	0.0	±0.8
136.9	136.9	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.1	0.1	±0.8
84.0	84.1	0.1	±0.8
79.0	79.1	0.1	±0.8
74.0	74.1	0.1	±0.8
69.0	69.1	0.1	±0.8
64.0	64.1	0.1	±0.8
59.0	59.1	0.1	±0.8
54.0	54.1	0.1	±0.8
49.0	49.1	0.1	±0.8
44.0	44.1	0.1	±0.8
42.0	42.1	0.1	±0.8
41.0	41.1	0.1	±0.8
40.0	40.1	0.1	±0.8
39.0	39.1	0.1	±0.8
38.0	38.0	0.0	±0.8

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

COPY



7. Tone burst response

Time weightings	Tone burst duration, T <sub>b</sub> (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
Fast	200	135.0	0.0	±0.5
	2	118.0	0.0	+1.0,-1.5
	0.25	108.9	-0.1	+1.0,-3.0
Slow	200	128.6	0.0	±0.5
	2	109.0	0.0	+1.0,-3.0
	200	129.0	0.0	±0.5
SEL	2	109.0	0.0	+1.0,-1.5
	0.25	99.9	-0.1	+1.0,-3.0

8. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limit (dB)
Complete cycle	128.4	128.4	0.0	±2.0
Positive half cycle	130.4	130.1	-0.3	±1.0
Negative half cycle	130.4	130.1	-0.3	±1.0

9. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limit (dB)
Positive one half cycle	Negative one half cycle		
139.1	139.1	0.0	±1.5

10. High level stability

Initial level (dB)	Final level (dB)	Deviated value (dB)	Acceptance limit (dB)
137.0	137.0	0.0	±0.1

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

COPY

Uncertainty of measurement

Parameters	Uncertainty
1. Indication at the calibration check frequency	0.12 dB
2. Self-generated noise	
- Frequency Weighting A	0.060 dB
- Frequency Weighting C	0.060 dB
- Frequency Weighting Z	0.066 dB
3. Electrical signal test of frequency weighting	
4. Frequency and time weightings at 1 kHz	0.13 dB
5. Long term stability test	0.13 dB
6. Level linearity on the reference level range	0.10 dB
7. Tone burst response	0.14 dB
8. Peak to sound level	0.14 dB
9. Overload indication	0.13 dB
10. High level stability test	0.10 dB

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

Remark : The acoustical signal test of frequency weighting at 125 Hz, 1 kHz, and 8 kHz is not included, along with correction values for environmental conditions in a free-field or diffuse field, and the effect of reflection and diffraction on the measurement microphone and the sound level meter.

Calibrated By:  (Mr. Chaiyaporn Sompichai)

Approved By:  (Mr. Pitupong Sarapho)

Date of calibration : 2025-02-28  
Date of issue : 2025-03-03

----- End of Calibration Certificate -----

COPY

**SOUND LEVEL METER**

**MODEL : NL-52A**

**SERIAL No. : 01120950**

## Calibration Certificate

Cert. No. : ACL25057  
Pages : 1 of 8

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 01120950 / 22043 / 22339  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 06 JANUARY 2025  
**Calibration Date :** 15 - 16 JANUARY 2025  
**Date of Issue :** 17 JANUARY 2025

**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.

COPY

Cert. No. : ACL25057  
Job No. : VC68AC0048  
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).

COPY  
T. Petchu.

Cert. No. : ACL25057  
Job No. : VC68AC0048  
Pages : 3 of 8

Cert. No. : ACL25057  
Job No. : VC68AC0048  
Page : 4 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 ∞ 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

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
13.4

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

Frequency Weighting	Weighting (dB)
A-weight	9.9
C-weight	16.4
Flat	21.9

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 Limits
125	0.4	0.4	± 1.0
1000	0.2	0.2	± 0.7
8000	0.5	0.5	+ 1.5, - 2.5

COPY

T. Petcha

COPY

T. Petcha



Cert. No. : ACL25057  
Job No. : VC68AC0048  
Pages : 5 of 8

Cert. No. : ACL25057  
Job No. : VC68AC0048  
Pages : 6 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
63	0.0	-0.1	0.0
125	0.0	0.1	0.0
250	0.0	0.0	0.0
500	0.0	0.1	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1
16000	0.0	-1.2	-1.2

#### 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

#### 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	$\pm 0.1$

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

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 0.8$
136.0	136.0	0.0	$\pm 0.8$
135.0	135.0	0.0	$\pm 0.8$
134.0	134.0	0.0	$\pm 0.8$
133.0	133.0	0.0	$\pm 0.8$
132.0	132.0	0.0	$\pm 0.8$
131.0	131.0	0.0	$\pm 0.8$
129.0	129.0	0.0	$\pm 0.8$
124.0	124.0	0.0	$\pm 0.8$
119.0	119.0	0.0	$\pm 0.8$
114.0	114.0	0.0	$\pm 0.8$
109.0	109.0	0.0	$\pm 0.8$
104.0	104.0	0.0	$\pm 0.8$
99.0	99.0	0.0	$\pm 0.8$
94.0	94.0	0.0	$\pm 0.8$
89.0	89.0	0.0	$\pm 0.8$
84.0	84.0	0.0	$\pm 0.8$
79.0	79.0	0.0	$\pm 0.8$
74.0	74.0	0.0	$\pm 0.8$
69.0	69.0	0.0	$\pm 0.8$
64.0	64.0	0.0	$\pm 0.8$
59.0	59.0	0.0	$\pm 0.8$
54.0	53.9	-0.1	$\pm 0.8$
49.0	49.0	0.0	$\pm 0.8$
44.0	44.0	0.0	$\pm 0.8$
39.0	38.9	-0.1	$\pm 0.8$
34.0	33.9	-0.1	$\pm 0.8$
30.0	30.0	0.0	$\pm 0.8$
29.0	28.9	-0.1	$\pm 0.8$
28.0	28.0	0.0	$\pm 0.8$
27.0	26.9	-0.1	$\pm 0.8$
26.0	26.0	0.0	$\pm 0.8$
25.0	25.0	0.0	$\pm 0.8$

COPY

T. Petch

COPY

T. Petch

Cert. No. : ACL25057  
Job No. : VC68AC0048  
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	±0.8

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	29.0	28.9	-0.1	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.1	0.1	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>peak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	130.0	130.0	0.0	±2.0
One	133.4	133.3	-0.1	±2.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

**11. Overload indication**

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

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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

End of Calibration Certificate

*T. Keteh.*

*T. Keteh.*

**ANALYTICAL BALANCE (DU)**

**Model : XS205DU**

**Serial No. : B344940005**



Certificate No. : 25-205716

Sample Code : 25-90375-006

Page 1 of 4

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.

683 Moo 11, Sukhapibarn 8 Rd, Nongkham,  
Siracha, Chonburi 20230Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.  
(Analytical Balance Room)

Equipment : ELECTRONIC BALANCE

Manufacturer : METTLER TOLEDO

Model : XS205DU

Serial No. : B344940005

ID No. : LABE 05/3

Date of Receipt : 26 November 2025

Date of Calibration : 26 November 2025

Calibrated by : Mr. Thanadol Pholthep  
Scientist

Issue date : 28 November 2025

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

(Mr. Somchai Neampunt)  
Signed for Director

Approved by

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 25-205716

Sample Code : 25-90375-006

Page 2 of 4

## REPORT OF CALIBRATION

Equipment : ELECTRONIC BALANCE

Manufacturer : METTLER TOLEDO

Model : XS205DU

Capacity : Max 81 g / 200 g

Resolution : 0.00001 g / 0.0001 g

Serial No. : B344940005

ID No. : LABE 05/3

## Result of Calibration

## 1. Test weight and repeatability of reading

Repeatability is a measure of the ability of a balance to supply the same result in repetitive weighings with one and the same load under the same measurement condition. The measurement of the repeatability must include both the balance specifications and the ambient (vibration, fluctuating air current/temperature/humidity, etc.) Operator handling of the balance is also included in the standard deviation.

Unit : g Range : 81 ☐ Before adjustment ☐ After adjustment

Nominal value 40 80

Standard weight 40.000087 80.000088

Average reading of indicator 40.000004 80.000004

Standard deviation 0.000007 0.000007

Unit : g Range : 200 ☐ Before adjustment ☐ After adjustment

Nominal value 100 200

Standard weight 99.999988 200.000015

Average reading of indicator 99.9999 199.9997

Standard deviation 0.000005 0.000005



Certificate No. : 25-205716

Sample Code : 25-90375-006

## REPORT OF CALIBRATION

## Result of Calibration

## 2. Sensitivity or value of a scale division

Change in the output variable of a measuring instrument divided by the associated change in the input variable.

Unit : g

Range : 81		Range : 200	
Test Point	Sensitivity, S	Test Point	Sensitivity, S
0	1.00000	0	1.0000
40	1.00000	100	1.0000
80	1.00000	200	1.0000

## 3. Departure of indication from nominal value, Linearity

Unit : g

Nominal Value	Standard Value	Average Reading of Indicator	Correction Value	Expanded Uncertainty	Coverage Factor (k)
Unload	0.0000000	0.00000	0.00000	0.000011	2.04
0.01	0.0100016	0.01000	0.00000	0.000011	2.04
0.1	0.1000056	0.10000	0.00001	0.000012	2.02
1	1.0000110	1.00000	0.00001	0.000015	2.01
5	4.9999996	4.99998	0.00002	0.000020	2.00
10	9.9999994	9.99999	0.00000	0.000026	2.00
20	20.0000042	20.00000	0.00004	0.000037	2.00
50	50.0000052	50.00003	0.00002	0.000067	2.00
100	99.9999988	100.00000	0.00000	0.00016	2.00
150	150.0000040	150.00001	-0.00001	0.00022	2.00
200	200.0000015	200.00001	-0.00001	0.00027	2.00

The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty multiplied by the coverage factor  $k$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with

UKAS M3003

361 Soi Ladkrang 122, Ladkrang Road,  
Phaholajung, Wang Thonglang, Bangkok 10310  
FM-CL-064

Tel: 02-516-2422  
Fax: 02-516-6949  
Rev.03

CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21



Certificate No. : 25-205716

Sample Code : 25-90375-006

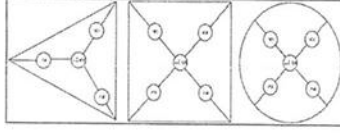
## REPORT OF CALIBRATION

## Result of Calibration :

## 4. Eccentric or off-centre loading

Deviation of the measurement value through off - center (eccentric) loading. The corner load increases with the weight of the load and its removal from the center of the pan support.

Weighing pan		Test weight : 50 and 100	
		Unit : g	
		Range	
		81	
		200	
Position	Reading of indicator	Reading of indicator	
1	50.00000	100.00000	
2	49.99997	100.00000	
3	49.99993	99.99999	
4	49.99999	100.00000	
5	50.00003	99.99999	
6	50.00000	100.00000	
Maximum difference		0.00007	



## Condition of Calibration

1. Calibration Method : WICL-004 base on UKAS LAB 14: 2019
2. This result of calibration was found accurate as shown on date and place of calibration only.
3. Condition of Calibration item: Normal
4. This certification is traceable to the International System of Unit maintained at :  
- Through the reference standard laboratory of Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (Instrument number 1).
5. Reference standard instrument :

Instrument : 1) STANDARD WEIGHT 1 mg to 1 kg  
Class : E2  
ID No. : LB-WE-78  
Certificate No. : 25-134074  
Due Date : 18 July 2026

6. Ambient conditions		Min	Max
Temperature (°C)		22.9	24.3
Relative Humidity (%Rh)		45.4	47.7
Air pressure (hPa)		1007.2	1011.0

- End of Report -



**ANALYTICAL BALANCE**

**Model : SECURA224-1S**

**Serial No. : 0036707137**



Certificate No. : 24-164695  
Sample Code : 24-67405-005

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhapibarn 8 Rd, Nongkham,  
Sriracha, Chonburi 20230

Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.  
(Analytical Balance Room)

Equipment : ELECTRONIC BALANCE

Manufacturer : SARTORIUS

Model : SECURA224-1S

Serial No. : 0036707137

ID No. : LABE 05/2

Date of Receipt : 19 December 2024

Date of Calibration : 19 December 2024

Calibrated by : Mr. Thanadol Pholthep  
Scientist

Issue date : 20 December 2024

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 24-164695  
Sample Code : 24-67405-005

## REPORT OF CALIBRATION

Equipment : ELECTRONIC BALANCE  
Manufacturer : SARTORIUS  
Model : SECURA224-1S  
Capacity : Max 220 g  
Resolution : 0.0001 g  
Serial No. : 0036707137  
ID No. : LABE 05/2

## Result of Calibration

## 1. Test weight and repeatability of reading

Repeatability is a measure of the ability of a balance to supply the same result in repetitive weighings with one and the same load under the same measurement condition. The measurement of the repeatability must include both the balance specifications and the ambient (vibration, fluctuating air current/temperature/humidity, etc.) Operator handling of the balance is also included in the standard deviation.

Unit : g	Range : 220	<input type="checkbox"/> Before adjustment	<input type="checkbox"/> After adjustment
<input checked="" type="checkbox"/> No adjustment	Nominal value	100	200
<input type="checkbox"/> Adjustment	Standard weight	100.000016	200.000028
	Average reading of indicator	100.0000	200.0000
	Standard deviation	0.00005	0.00005

Unit : -	Range : -	<input type="checkbox"/> Before adjustment	<input type="checkbox"/> After adjustment
<input type="checkbox"/> No adjustment	Nominal value	-	-
<input type="checkbox"/> Adjustment	Standard weight	-	-
	Average reading of indicator	-	-
	Standard deviation	-	-

Certificate No. : 24-164695  
Sample Code : 24-67405-005

## REPORT OF CALIBRATION

## Result of Calibration

## 2. Sensitivity or value of a scale division

Change in the output variable of a measuring instrument divided by the associated change in the input variable.

Unit : g

Range :		Range :	
Test Point	Sensitivity, S	Test Point	Sensitivity, S
0	0.9998		
100	0.9998		
200	0.8998		

## 3. Departure of indication from nominal value, Linearity

Unit : g

Nominal Value	Standard Value	Average Reading of Indicator	Correction Value	Expanded Uncertainty	Coverage Factor (k)
Unload	0.0000000	0.0000	0.0000	0.000094	2.01
0.01	0.0100015	0.0100	0.0000	0.000094	2.01
0.1	0.1000064	0.1000	0.0000	0.000094	2.01
1	1.0000017	1.0000	0.0000	0.000095	2.01
2	2.0000049	2.0000	0.0000	0.000095	2.01
5	5.0000012	5.0000	0.0000	0.000096	2.01
10	9.999992	10.0000	0.0000	0.000097	2.01
20	20.000042	20.0000	0.0000	0.00010	2.01
50	50.000046	50.0000	0.0000	0.00012	2.01
100	100.000016	100.0000	0.0000	0.00016	2.00
200	200.000028	200.0000	0.0000	0.00028	2.00

The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003.

361 Sol Ladprao 122, Ladprao Road,  
Phatphla, Wang Thonglang, Bangkok 10310  
FM CL 084

TEL 02-516-2422  
FAX 02-516-6949  
Rev.03CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date 15/10/21Certificate No. : 24-164695  
Sample Code : 24-67405-005

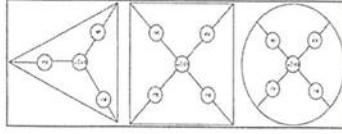
## REPORT OF CALIBRATION

## Result of Calibration :

## 4. Eccentric or off-centre loading

Deviation of the measurement value through off-center (eccentric) loading. The corner load increases with the weight of the load and its removal from the center of the pan support.

Weighing pan		Test weight : 100	
		Unit : g	
		220	
Range	Position	Reading of indicator	Reading of indicator
1		99.9999	
2		100.0001	
3		99.9999	
4		99.9998	
5		99.9999	
6		99.9999	
Maximum difference		0.0002	



## Condition of Calibration

- Calibration Method : WI-CL-004 base on UKAS LAB 14: 2019
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibration item: Normal
- This certification is traceable to the International System of Unit maintained at :  
Through the reference standard laboratory of Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (Instrument number 1).
- Reference standard instrument :  
1) STANDARD WEIGHT 1 mg to 1 kg

6. Ambient conditions	Min	Max
Temperature (°C)	25.0	25.4
Relative Humidity (%RH)	39.8	41.0
Air pressure (hPa)	101.0	102.1

Class : E2  
ID No. : LB-WF-78  
Certificate No. : 24-097116  
Due Date : 02 August 2025

- End of Report -



361 Sol Ladprao 122, Ladprao Road,  
Phatphla, Wang Thonglang, Bangkok 10310  
FM CL 084

TEL 02-516-2422  
FAX 02-516-6949  
Rev.03CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date 15/10/21



**Hot Air Oven**

**Model : UM 400**

**Serial No. : 900982**



## CERTIFICATE OF CALIBRATION

Page 1 of 3  
Certificate No. : 24-164692  
Sample Code : 24-67405-002Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhaphibarn 8 Rd. Nongkham,  
Sriacha-Chonburi 20230Location of Calibration : EASTERN THAI CONSULTING 1992 CO., LTD.  
(Hot Lab)

Equipment : Temperature controlled enclosures (Hot air oven)

Manufacturer : Memmert Model : UM 400  
Serial No. : 900982 ID No. : LABE T7/1

Date of Receipt : 19 December 2024 Date of Calibration : 19 December 2024

## Condition of Calibration

1. Environment

1.1 Ambient temperature : Maximum 32.1 °C ; Minimum 30.4 °C

1.2 Relative humidity : Maximum 48.9 % ; Minimum 42.4 %

1.3 Line voltage supplied : Maximum 226.3 VAC ; Minimum 221.0 VAC

## 2. Calibration method

TLAS-G-20: Guidelines for calibration and checks of temperature controlled enclosures

## 3. Reference standard instrument

Instrument	ID No.	Certificate No.	Due Date
Data Acquisition With Sensor (RTD-PH00)	LB-DA-11 (RTD-148 to RTD-155, RTD-227)	24-040190	03 April 2025

## 4. This certificate is traceable to the international system of unit (SI Unit).

The measurement is traceable to Asia Medical and Agricultural Laboratory and Research Center Public Company Limited.

## 5. This result of calibration was found accurate as shown on date and place of calibration only.

## 6. Condition of calibration item : Normal

Calibrated by

Mr. Nophanon Anusak  
Scientist

Approved by

(Mr. Sontichai Neampunt)  
Signed for Director

Issue date

20 December 2024

This measurement is for a confidence probability of approximately 95%.

This calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

361 Soi Ladprao 122, Ladprao Road,  
Phlabphla, Wang Thonglang, Bangkok 10310  
Tel 02-516-2422 Fax 02-516-6949  
Rev 01CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21

## REPORT OF CALIBRATION

Page 2 of 3  
Certificate No. : 24-164692  
Sample Code : 24-67405-002

## Results of Calibration

Resolution : 0.1 °C

## 1. Reporting of Temperature

Calibration point (°C)	UUC* setting (°C)	UUC* leading (°C)	Measured temperature at each positions (°C)								Uncertainty ± (°C)	Coverage factor k	
			# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9		
85	85.0	85.0	85.33	85.28	84.83	85.01	85.15	85.18	85.32	85.12	85.23	0.25	2.00

## 2. Characterization results

Calibration point (°C)	Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
85	0.10	0.43	0.69

## Notes

\* UUC\* = Unit Under Calibration

COPY

361 Soi Ladprao 122, Ladprao Road,  
Phlabphla, Wang Thonglang, Bangkok 10310  
Tel 02-516-2422 Fax 02-516-6949  
Rev 09CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21

## REPORT OF CALIBRATION

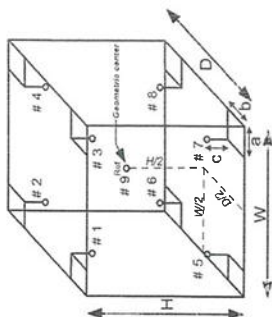
Page 3 of 3

 Certificate No. : 24-164692  
 Sample Code : 24-67405-002

## Results of Calibration

## Notes

1. Sensor installation locations
  - 1.1 All sensors at any corners or walls should be positioned 5 cm (a x b x c) from the wall.
  - 1.2 The reference sensor is preferably located of the geometric center of the chamber.
2. Interior dimensions approx of chamber :  
 $W = 40 \text{ cm}$  ;  $D = 28 \text{ cm}$  ;  $H = 39 \text{ cm}$
3. Air valve or fresh air level : Off
4. Fan level : Open
5. The quoted uncertainty includes "Stability of chamber and loading effect in chamber at 20% of uniformity".
6. 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.
7. Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.
8. Overall variation - the difference of the maximum and the minimum measured temperatures throughout observation time.
9. UUC\* reading - the average reading of indicating device that forms the integral part of the enclosure.
10. Calibration results without adjustment.


 Figure. Example of sensor  
 installation Positions

This result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty multiplied by the coverage factor  $k$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS MD003

- End of Report -

COPY

**LIQUID IN GLASS THERMOMETER**

**Model / Type : 0-100 °C**

**Serial No. : 43560**





## CALIBRATION LABORATORY CO., LTD.

2/10-11/14 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230  
Tel. 02-578-0353-4 Fax: 02-578-2672 www.ccl-laboratory.com E-mail: sale@ccl-laboratory.com



ANAB  
ACCREDITED  
CALIBRATION AND  
DIMENSIONAL MEASUREMENT  
LABORATORY

### CERTIFICATE OF CALIBRATION

#### FOR

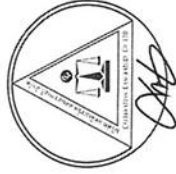
NOMENCLATURE : LIQUID IN GLASS THERMOMETER  
MANUFACTURER : AA PRECISION  
MODEL / TYPE : 0-100 °C  
SERIAL NO. : 43560(LABE 16/1)  
CLID. NO. : 232403905  
JOB CONTROL NO. : 251115135334  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 MOO 11, SUKHAPIBARN 8 RD,  
NONGKHAM, SRIRACHA, CHONBURI 20230

DATE OF RECEIVED : 15 November 2025 DATE OF ISSUED : 18 November 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By : Pimsiri Hemtanon  
Calibration Engineer



Approved By : Mongkol Yosoonontom  
Authorized Signatory  
18 November 2025

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25135334  
F3-011-05/12-23

COPY



@cclcalibration



## CALIBRATION LABORATORY CO., LTD.

2/10-11/14 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230  
Tel. 02-578-0353-4 Fax: 02-578-2672 www.ccl-laboratory.com E-mail: sale@ccl-laboratory.com



ANAB  
ACCREDITED  
CALIBRATION AND  
DIMENSIONAL MEASUREMENT  
LABORATORY

### REPORT OF CALIBRATION

#### FOR

NOMENCLATURE : LIQUID IN GLASS THERMOMETER  
MANUFACTURER : AA PRECISION  
MODEL / TYPE : 0-100 °C  
SERIAL NO. : 43560(LABE 16/1)  
DATE OF CALIBRATION : 17 November 2025

#### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$  Relative Humidity :  $(55 \pm 10) \%$

#### PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPTH-02 based on ASTM E 77-07 as calibration guidelines.  
The calibration was performed by comparison with Calibration Bath, Precision Thermometer and IPT which maintained by the Calibration Laboratory Co., Ltd.

#### REFERENCE STANDARD USED :

1. Calibration Bath, Kamble Model OB-22/2 ULT, OB-22/2 S/N. 17115653, 17115654.
2. Precision Thermometer, ASL Model F200-A-8 S/N. 01443303 with IPT S/N. L0193A-1-1, PO106346-1-13.

#### TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through Calibration Laboratory Co., Ltd. Certificate No. Q24120999, Q25124610. Due Date 26 November 2025, 07 November 2026.
2. The measurements are traceable to International System of Units (SI), through Thailand Institute of Scientific and Technological Research (TISTR) and National Institute of Metrology (Thailand). Certificate No. PSL-T 0177/68, TT-0169-24, TT-1008-25. Due Date 10 February 2026, 11 December 2025, 04 March 2026.

#### UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2$  which for a normal distribution corresponds to a coverage probability of approximately 95%. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q25135334  
F3-011-05/12-23

COPY



@cclcalibration



# CALIBRATION LABORATORY CO., LTD.

210-11 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230  
Tel. 02-578-0353-4 Fax: 02-578-2672 www.cali-lab.com E-mail:sale@cal-lab.com



CLC  
Accredited  
ISO/IEC 17025

## CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment

The DUC Reading were recorded and the means value were reported of four times measurement in the table below.

### CALIBRATION DATA

#### CORRECTION OF TEMPERATURE

STD Reading ( °C )	DUC Reading ( °C )	Correction ( °C )	Uncertainty ± ( °C )
0.01	0.00	+0.01	0.06
25.02	25.00	+0.02	
50.03	50.00	+0.03	
100.01	100.00	+0.01	

Range : 0 °C to 100 °C

Graduation : 0.1 °C

Immersion Type : Total Immersion.

Correction of Reference Temperature ( 0 °C ) = 0.00 °C

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 016 Page 60 of 73

This report is valid for the above stated instrument/s only.

### End of Certificate ###

Certificate No. Q25135334

F3-01-05/12-23

COPY



@calibration

**pH Meter**

**Model : SevenCompact S220**

**Serial No. : B835349235**

Certificate Number CCP-0403-25

## Calibration Certificate SevenCompact™ pH/Ion Meter S220

### Customer

Company EASTERN THAI CONSULTING 1992 CO., LTD.

Address 663 Moo 11, Sukhaphiban 6 Rd., Nong Kham

Siracha

CHONEBURI 20230

Customer ID number 301608441

Customer representative ณัฐริศ วัฒนวิญญ์

### Instrument

Type SevenCompact™ S220

Instrument Serial Number BE55349235

Internal Identification LABEL 11/6

Firmware version 1.20.06

### Technical specifications

Measuring Range -1999.9 ... 1999.9 mV  
Resolution 0.1 mV  
Limit of Error  $\pm 0.2$  mV

-2.000 ... 20.000 pH  
0.001 pH  
 $\pm 0.002$  pH

Temperature range MTC -30.0 ... 130.0 °C  
Temperature range ATC -5.0 ... 130.0 °C  
Resolution 0.1 °C  
Limit of Error  $\pm 0.1$  °C

### Procedure Statement

METTLER TOLEDO Calibration SOP (Doc. No. ME-3002/5778) will be used as referring documentation to adjust and certify the instrument indicated in the "Type" and "Serial number" section. The measurement results of this certification were obtained at ambient conditions.

COPY

Certificate Number CCP-0403-25

### Certification Tools

Certified digital voltmeter

Manufacturer KEYSIGHT TECHNOLOGIES

Type 34461A

Control No. ANA143

Serial number MY60036987

Certificate number EU02401054

Due date March 10, 2025

Certified Temperature  
Resistors

Manufacturer METTLER-TOLEDO

Type 51302410

Control No. ANA114

Serial number A275

Certificate number 73757

Due date February 12, 2026

Designation	Nominal value	Certified value
NTC 30 k $\Omega$ , 0 °C	94.980 k $\Omega$	94.9730 k $\Omega$
NTC 30 k $\Omega$ , 25 °C	30.000 k $\Omega$	29.9950 k $\Omega$
NTC 30 k $\Omega$ , 50 °C	10.969 k $\Omega$	10.9704 k $\Omega$
NTC 30 k $\Omega$ , 75 °C	4.528 k $\Omega$	4.5275 k $\Omega$
NTC 30 k $\Omega$ , 100 °C	2.070 k $\Omega$	2.0714 k $\Omega$
PT1000, 0 °C	1.000 k $\Omega$	1.0001 k $\Omega$
PT1000, 25 °C	1.0974 k $\Omega$	1.0975 k $\Omega$
PT1000, 50 °C	1.1940 k $\Omega$	1.1942 k $\Omega$
PT1000, 75 °C	1.2899 k $\Omega$	1.2900 k $\Omega$
PT1000, 100 °C	1.3851 k $\Omega$	1.3851 k $\Omega$

COPY



Certificate Number CCP-0403-25

## Certification Measurements

Designation	Certified value	Measured value	Max. Tolerance	Passed / Failed
pH/mV Sensor Input				
-1900 mV	-1900.0 mV	-1899.98 mV	0.2 mV	Passed
-1000 mV	-1000.0 mV	-1000.00 mV	0.2 mV	Passed
-500 mV	-500.0 mV	-499.98 mV	0.2 mV	Passed
-180 mV	-180.0 mV	-180.00 mV	0.2 mV	Passed
0 mV	0.0 mV	0.01 mV	0.2 mV	Passed
180 mV	180.0 mV	179.98 mV	0.2 mV	Passed
500 mV	500.0 mV	499.90 mV	0.2 mV	Passed
1000 mV	1000.0 mV	1000.00 mV	0.2 mV	Passed
1900 mV	1900.0 mV	1899.99 mV	0.2 mV	Passed

Designation	Measured low Imp.	Measured high Imp.	Max. Tolerance	Passed / Failed
pH/mV Sensor Input at high impedance				
1900 mV	1900.0 mV	1899.8 mV	0.6 mV	Passed

Designation	Nominal value	Measured value	Max. Tolerance	Passed / Failed
Temperature Sensor Input				
NTC 30 kΩ, 0 °C	0.0 °C	0.0 °C	0.1 °C	Passed
NTC 30 kΩ, 25 °C	25.0 °C	25.0 °C	0.1 °C	Passed
NTC 30 kΩ, 50 °C	50.0 °C	50.0 °C	0.1 °C	Passed
NTC 30 kΩ, 75 °C	75.0 °C	74.9 °C	0.1 °C	Passed
NTC 30 kΩ, 100 °C	100.0 °C	100.0 °C	0.1 °C	Passed
PT1000, 0 °C	0.0 °C	0.1 °C	0.1 °C	Passed
PT1000, 25 °C	25.0 °C	25.0 °C	0.1 °C	Passed
PT1000, 50 °C	50.0 °C	50.0 °C	0.1 °C	Passed
PT1000, 75 °C	75.0 °C	74.9 °C	0.1 °C	Passed
PT1000, 100 °C	100.0 °C	99.9 °C	0.1 °C	Passed

## Summary of Certification

Certification of Instrument

Passed

The instrument referred to in this certificate has fulfilled the criteria of the certification. This is indicated by the notation Passed in the column above.

Remarks - Test high impedance at 1900.0 mV, Results : 1899.8 mV

Difference = 0.005% Within MPE (0.033%)

Certification of the Instrument was performed by

Name Khomsan Praisaung Function Service

Place Mettler-Toledo (Thailand) Ltd.

Calibration Date: 29-Jan-2025

Signature

Mettler-Toledo (Thailand) Limited

METTLER TOLEDO

## Performance Test

Attachment to Certificate No. CCP-0403-25

pH Electrode

Type: InLab Expert Pro-ISM S/N: 2463982

## Certified standards used

Standard 1:	Type: pH Buffer	Manufacturer: METTLER TOLEDO	Exp. date: 3-Dec-2026
	Nominal value: pH ( 25.00 °C):	4.01	Lot No.: 1J338E
Standard 2:	Type: pH Buffer	Manufacturer: METTLER TOLEDO	Exp. date: 27-Nov-2026
	Nominal value: pH ( 25.00 °C):	7.00	Lot No.: 1J331B
Standard 3:	Type: pH Buffer	Manufacturer: METTLER TOLEDO	Exp. date: 11-Jan-2026
	Nominal value: pH ( 25.00 °C):	10.00	Lot No.: 1K011B
Standard 4:	Type: Redox Solution	Manufacturer: METTLER TOLEDO	Exp. date: -
	Nominal value: pH ( 25.00 °C):	-	Lot No.: -

## Adjustment

Set Calibration Buffer		B1		(25 °C) 1.69, 4.01, 7.00, 10.01	
Select Calibration Mode Segment		3-Point calibration		2-Point calibration	
3-Point Calibration		°C	pH	°C	pH
Cal 1		ATC	25.5	7.00	ATC
Cal 2		ATC	25.5	4.00	ATC
Offset (mV)		-27.2			
Slope % (or mV/pH)		95.9			
Cal 3		ATC	25.5	10.01	
Offset (mV)		-27.2			
Slope % (or mV/pH)		97.4			

## Measurements

Resolution: 2 Decimal places

As Found				As Left			
Buffer Values		Measured	Difference	Buffer Values		Measured	Difference
pH	°C	pH		pH	°C	pH	pH
4.01	25.3	ATC	4.02	4.01	25.3	ATC	4.01
7.00	25.2	ATC	6.98	-0.02	7.00	25.2	ATC
9.99	25.3	ATC	10.11	0.12	9.99	25.2	ATC

Redox Measurement Result = - mV

Note: The difference result of calibrated electrode should be within +/- 0.05 pH

Remarks: N/A

Place: Laboratory

Calibration Date: 29-Jan-2025

Service Specialist: Khomsan Praisaung

Signature: 

**STANDARD WEIGHT 50 g**



Certificate No. : 24-062445  
Sample Code : 24-25551-001

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhapibarn 8 Rd., Nongkham,  
Sriracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited  
(Calibration Laboratory)

Equipment : Standard Weight 50 g

Manufacturer : METTLER TOLEDO

Class : F1

Serial No. : N/A

ID No. : LABE 10/1

Date of Receipt : 23 May 2024

Date of Calibration : 03 June 2024

Calibrated by : Mr. Somwang Sangdee  
Scientist  
Issue date : 04 June 2024

04 June 2024

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 24-062445  
Sample Code : 24-25551-001

## REPORT OF CALIBRATION

Equipment : Standard Weight 50 g

Manufacturer : METTLER TOLEDO

Class : F1

Serial No. : N/A

ID No. : LABE 10/1

## Result of Calibration :

☒ Without adjustment

☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature ( $t_{ref}$ ) of 20°C, the conventional mass is the mass of a reference weight of a density ( $\rho_{ref}$ ) of 8000 kg.m<sup>-3</sup> which it balances in air of a reference density ( $\rho_0$ ) of 1.2 kg.m<sup>-3</sup>

Description	Deviation (mg)	Conventional Mass	Expanded Uncertainty (mg)	Maximum Permissible Error $\pm$ (mg)	ID No.
50 g	-0.343	49.999657 g	0.10	0.30	LABE 10/1

The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2.0$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with LUKAS M3003

*Signature*

*Signature*



Certificate No. : 24-062445

Sample Code : 24-25551-001

Page 3 of 3

## REPORT OF CALIBRATION

## Condition of Calibration

1. Ambient Conditions : Temperature  $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ , Relative humidity  $50\% \pm 10\%$  and air density  $1.19 \text{ kg/m}^3$ 

2. Calibration Method : Direct comparison weighing according to OIML R111-1 : 2004(E)

3. Reference standard Instrument

Instrument	Class	ID No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WF-83	24-001894	11 January 2025

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

5. Condition of Calibration item: Normal

## 6. Description of Calibrated Item :

Type and Nominal Value :	Standard Weight 50 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

- End of Report -



**STANDARD WEIGHT 100 g**



Certificate No. : 24-079772

Sample Code : 24-31841-002

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhapibarn 8 Rd., NongKham,  
Siracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited  
(Calibration Laboratory)

Equipment : Standard Weight 100 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/2

Date of Receipt : 25 June 2024

Date of Calibration : 30 June 2024

Calibrated by : Mr. Nawa Sisuwan  
Scientist  
Issue date : 03 July 2024

Approved by

( Mr. Somchai Neampunt )  
Signed for Director

*[Signature]*  
**COPY**

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and place of calibration only.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).



Certificate No. : 24-079772

Sample Code : 24-31841-002

## REPORT OF CALIBRATION

Equipment : Standard Weight 100 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/2

## Result of Calibration :

☒ Without adjustment☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature ( $t_{ref}$ ) of 20°C, the conventional mass is the mass of a reference weight of a density ( $\rho_{ref}$ ) of 8000 kg.m<sup>-3</sup> which it balances in air of a reference density ( $\rho_a$ ) of 1.2 kg.m<sup>-3</sup>

Description	Deviation (mg)	Conventional Mass	Expanded Uncertainty (mg)	Maximum Permissible Error $\pm$ (mg)	ID No.
100 g	-0.173	99.999627 g	0.16	0.50	LABE 10/2

The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2.0$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

*[Signature]*



Certificate No. : 24-079772

Sample Code : 24-31841-002

## REPORT OF CALIBRATION

## Condition of Calibration

1. Ambient Conditions : Temperature  $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ , Relative humidity  $50\% \pm 10\%$  and air density  $1.19 \text{ kg/m}^3$
2. Calibration Method : WI-CL-007 base on OIML R 111-1 : 2004(E)

## 3. Reference standard instrument

Instrument	Class	ID No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WE-83	24-001894	11 January 2025

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

## 5. Condition of Calibration item: Normal

## 6. Description of Calibrated Item :

Type and Nominal Value :	Standard Weight 100 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

- End of Report -

**STANDARD WEIGHT 50 g**





Certificate No. : 24-079773

Sample Code : 24-31841-003

## CERTIFICATE OF CALIBRATION

Customer : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 Moo 11, Sukhapibarn 8 Rd., NongKham,  
Sriracha, Chonburi 20230

Location of Calibration : Asia Medical and Agricultural Laboratory and Research Center Public Company Limited  
(Calibration Laboratory)

Equipment : Standard Weight 50 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/4

Date of Receipt : 25 June 2024

Date of Calibration : 30 June 2024

Calibrated by Mr. Nawa Sisuwan Approved by ( Mr. Somchai Neampunt )  
Scientist

Issue date 03 July 2024

The uncertainties are for a confidence probability of approximately 95%.

The calibration result is applied only to the above calibrated item and was found accurate as shown on date and under the stated conditions.

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 unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Asia Medical and Agricultural Laboratory and Research Center Public Company Limited (AMARC).

361 Soi Ladprao 122, Ladprao Road,  
Phialapha, Wang Thonglang, Bangkok 10310  
TM Cl. 017

TEL 02-516-2422  
FAX 02-516-6949  
Rev 05

CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21



Certificate No. : 24-079773

Sample Code : 24-31841-003

## REPORT OF CALIBRATION

Equipment : Standard Weight 50 g

Manufacturer : N/A

Class : N/A

Serial No. : N/A

ID No. : LABE 10/4

Result of Calibration :

☒ Without adjustment☐ Adjustment

Conventional value of the result of weighing in air. For a weight taken at a reference temperature ( $t_{ref}$ ) of 20°C, the conventional mass is the mass of a reference weight of a density ( $\rho_{ref}$ ) of 8000 kg.m<sup>-3</sup> which it balances in air of a reference density ( $\rho_a$ ) of 1.2 kg.m<sup>-3</sup>

Description	Deviation (mg)	Conventional Mass	Expanded Uncertainty (mg)	Maximum Permissible Error $\pm$ (mg)	ID No.
50 g	-0.176	49.999824 g	0.10	0.30	LABE 10/4

The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2.0$ , which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with UKAS M3003

TEL 02 516 2422  
FAX 02-516-6949  
Rev 03

361 Soi Ladprao 122, Ladprao Road,  
Phialapha, Wang Thonglang, Bangkok 10310  
TM Cl. 06A

CONTACT@AMARC.CO.TH  
WWW.AMARC.CO.TH  
Effective Date: 15/10/21



Certificate No. : 24-079773

Sample Code : 24-31841-003

Page 3 of 3

## REPORT OF CALIBRATION

## Condition of Calibration

1. Ambient Conditions : Temperature  $20^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ ; Relative humidity  $50\% \pm 10\%$  and air density  $1.19\text{ kg/m}^3$
2. Calibration Method : WI-CL-007 base on OIML R 111-1 : 2004(E)
3. Reference standard instrument

Instrument	Class	ID No.	Certificate No.	Due Date
1) Standard Weight 1 mg to 1 kg	E2	LB-WE-83	24-001894	11 January 2025

4. This certification is traceable to the International System of Unit maintained at : -

Asia Medical and Agricultural Laboratory and Research Center Public Company Limited

(Instrument number 1).

5. Condition of Calibration item: Normal

## 6. Description of Calibrated Item :

Type and Nominal Value :	Standard Weight 50 g
Shape :	Cylindrical weight with knob
Material :	Stainless steel
Case :	Wooden Box
Comments :	Recalibration

- End of Report -

COPY

**UV/VIS SPECTROPHOTOMETER**

**Model : UV-1800**

**Serial No. : A11635101643 CD**



Bara Scientific Co., Ltd.  
968 U Chu Liang Building Floor7 Rama4 Road  
Sliom Bangkok Bangkok Thailand 10500  
Tel : 02-6324300 Fax : 02-6375496-7  
www.barascientific.com



## Certificate of Calibration

Number of Page(s) 1 of 3

Certificate No.

BSCC-UV-153/25

Equipment

UV/Vis Spectrophotometer

Model

UV-1800

Manufacturer

Shimadzu

Serial No.

A11635101643 CD

ID No.

LABE 03/2

Date of receipt

21 April 2025

Date of calibration

21 April 2025

Date of issue

25 April 2025

Customer name

Eastern Thai Consulting 1992 Co., Ltd.

Address

683 Moo 11, Sukkaphitbam 8 Rd., Nongkham, Siriracha, Chonburi 20230

Temperature

(24.7±0.8) °C (On site)

Humidity

(36.9±46.2) %RH (On site)

Equipment condition

Good Operation

Calibration Location

Analysis Department

Calibration Procedure

In-house method WI-UV-702-01 based on ASTM E275-01

Traceability

Wavelength Accuracy is traceable to certificate No. 114485 and 114511

Photometric Accuracy is traceable to certificate No. 119612 and 114653

Stray Light is traceable to certificate No. 114484

The above certificate are traceable to SI unit through Starna Scientific Ltd.

(UKAS accredited calibration laboratory NO. 0659)

Calibrated by

Mr Phongpak Sonbunchu

Approved by

Mr. Panhaphong Phannetkukul  
Technical Manager



The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.  
Advertising the report / Certificate and publicity of the results are prohibited and also shall not be reproduced  
except in full, without written approval of the Bara Scientific Co., Ltd

FM-UV-708-02 Rev.01 (2301/63)



Bara Scientific Co., Ltd.  
968 U Chu Liang Building Floor7 Rama4 Road  
Sliom Bangkok Bangkok Thailand 10500  
Tel : 02-6324300 Fax : 02-6375496-7  
www.barascientific.com



## Certificate of Calibration

Certificate No. BSCC-UV-153/25

Number of Page(s) 2 of 3

Calibration Results:

1. Wavelength Accuracy

Certified Wavelength (nm)	UUC (nm)	Error (nm)	Uncertainty (±nm)
287.71	287.70	-0.01	0.18
445.82	445.87	0.05	0.18
538.52	538.52	0.00	0.18
741.02	741.05	0.03	0.18
879.41	879.33	-0.08	0.18

2. Photometric Accuracy (UV)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty (±A)
235	0.0000	-0.0001	-0.0001	0.0075
	0.7404	0.7416	0.0012	0.0075
257	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
313	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
350	0.0000	0.0000	0.0000	0.0075
	0.6397	0.6398	0.0001	0.0075

\*CNR = Customer not request



The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.  
Advertising the report / Certificate and publicity of the results are prohibited and also shall not be reproduced  
except in full, without written approval of the Bara Scientific Co., Ltd

FM-UV-708-02 Rev.01 (2301/63)





**Bara Scientific Co., Ltd.**  
968 U Chu Liang Building Floor7 Rama4 Road  
Silom Bangkok Bangkok Thailand 10500  
Tel : 02-6324300 Fax : 02-6375496-7  
www.barascientific.com



# Certificate of Calibration

Certificate No. BSCC-UV-153/25

Number of Page(s) 3 of 3

Calibration Results:

## 3. Photometric Accuracy (Visible)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty ( $\pm$ A)
420.0	0.0000	0.0001	0.0001	0.0042
	0.5733	0.5712	-0.0021	0.0042
	0.7113	0.7097	-0.0016	0.0042
	1.0164	1.0150	-0.0014	0.0042
440.0	0.0000	0.0000	0.0000	0.0042
	0.5581	0.5559	-0.0022	0.0042
	0.6996	0.6975	-0.0021	0.0042
	1.0000	0.9984	-0.0016	0.0042
465.0	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
546.1	0.0000	0.0000	0.0000	0.0042
	0.5217	0.5202	-0.0015	0.0042
	0.6970	0.6947	-0.0023	0.0042
	0.9982	0.9969	-0.0013	0.0042
590.0	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
	CNR	CNR	CNR	CNR
635.0	0.0000	0.0000	0.0000	0.0042
	0.5630	0.5620	-0.0010	0.0042
	0.7615	0.7594	-0.0021	0.0042
	1.0953	1.0943	-0.0010	0.0042

\*CNR = Customer not request

## 4. Stray Light\*

Standard cut-off wavelength (nm)	Unit Under Calibration(UUC)	
	Wavelength (nm)	Absorbance (A)
201.10 $\pm$ 0.1nm	200.85	2.0116

The Stray light transmission reference is less than 1.0%T and Stray light absorbance reference is greater than 2.00A

\*Stray Light not NSC-ONSC Accredited.

The measurement uncertainty is base on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

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

**COPY**

The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.  
Advertising the report / Certificate and publicity of the results are prohibited and also shall not be reproduced except in full without written approval of the Bara Scientific Co., Ltd.

**SOUND LEVEL CALIBRATOR**

**MODEL : NC-75**

**SERIAL No. : 34302326**

Cert. No. : ACC25018  
 Pages : 1 of 3

Cert. No. : ACC25018  
 Job No. : VC68AC0077  
 Pages : 2 of 3

## Calibration Certificate

Calibration Procedure : CP-AC-03

Equipment : SOUND CALIBRATOR

Manufacturer : RION

Model : NC-75

Serial No.: 34302326

ID No.:

### 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 As Found :

GOOD

Customer :

EASTERN THAI CONSULTING 1992 CO., LTD.  
 SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
 NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

Location :

Ambient Temperature : ( 23.0 ± 3 ) °C

Pressure : ( 101.3 ± 3 ) kPa

Relative Humidity : ( 50.0 ± 20 ) %

Received Date :

02 APRIL 2025

Calibration Date :

30 APRIL 2025

Date of Issue :

02 MAY 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

*T. Petchur*

( Thanakul Petchurai )

**COPY**

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.

### Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KAI	34560495	AA-3002-25	19-FEB-26
Audio Analyzer	AVR-3360A	V744B6069	EF-0013-25	13-FEB-26

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 Electrical And Electronics Institute (EEI).

**COPY**

*T. Petchur*

Cert. No. : ACC/5018  
Job No. : VC68AC0077  
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	94.03	0.03	0.15	0.40

**2. Frequency**

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Acceptance limit (%)
1000	1000.0	0.0	0.1	1.0

**3. Total distortion**

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
0.79	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**

**COPY**

*T. Petch*



**SOUND LEVEL METER**

**MODEL : NL-42A**

**SERIAL No. : 00322756**

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42A / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00322756 / 196480 / 15488  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 02 APRIL 2025  
**Calibration Date :** 28 APRIL 2025  
**Date of Issue :** 02 MAY 2025

**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.

**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	IEF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	IEF-0012-25	11-FEB-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	IEF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

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 Electrical And Electronics Institute (EEI).

*T. Petchur*  


*T. Petchur*

Cert. No. : ACL25181

Job No. : VC68AC0077

Pages : 3 of 8

Cert. No. : ACL25181

Job No. : VC68AC0077

Page : 4 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

COPY

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)
14.2

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	22.5

**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
125	0.5	0.5	0.5
1000	0.1	0.1	0.1
8000	0.0	0.1	0.1
			Acceptance Limits
			± 1.5
			± 1.0
			±5.0

COPY

T. Petch.

Cert. No. : ACL25181

Job No. : VC68AC0077

Pages : 5 of 8

Cert. No. : ACL25181

Job No. : VC68AC0077

Pages : 6 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
63	0.0	0.0	0.0
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.1	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.1	0.0
8000	0.0	0.1	0.1

## 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

## 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	$\pm 0.3$

## 7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.1	0.1	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.0	0.0	$\pm 1.1$
84.0	84.0	0.0	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.0	0.0	$\pm 1.1$
69.0	69.0	0.0	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.0	0.0	$\pm 1.1$
54.0	54.0	0.0	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	44.0	0.0	$\pm 1.1$
39.0	39.0	0.0	$\pm 1.1$
34.0	34.0	0.0	$\pm 1.1$
30.0	29.9	-0.1	$\pm 1.1$
29.0	29.0	0.0	$\pm 1.1$
28.0	27.9	-0.1	$\pm 1.1$
27.0	27.0	0.0	$\pm 1.1$
26.0	25.9	-0.1	$\pm 1.1$
25.0	24.9	-0.1	$\pm 1.1$

COPY

T. Petch.

T. Petch.



Cert. No. : ACL25181

Job No. : VC68AC0077

Pages : 7 of 8

Cert. No. : ACL25181

Job No. : VC68AC0077

Pages : 8 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	$\pm 1.1$

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	$\pm 1.1$

## 9. Tone burst response

Time Weighting	Tone burst duration, T <sub>b</sub> (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	$\pm 1.0$
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	$\pm 1.0$
	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	$\pm 1.0$

## 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	$\pm 3.0$
One	133.4	133.4	0.0	$\pm 3.0$

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	$\pm 2.0$
Positive half cycle	135.4	135.1	-0.3	$\pm 2.0$
Negative half cycle	135.4	135.1	-0.3	$\pm 2.0$

## 11. Overload indication

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

## 12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	136.9	137.0	-0.1	$\pm 0.3$

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

COPY

Z. Petch.

COPY

Z. Petch.

**SOUND LEVEL METER**

**MODEL : NL-42A**

**SERIAL No. : 00322750**

Cert. No. : ACL25046  
 Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42A / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00322750 / 196473 / 15482  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
 SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
 NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 06 JANUARY 2025  
**Calibration Date :** 15 - 16 JANUARY 2025  
**Date of Issue :** 17 JANUARY 2025

**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.

**COPY**

Cert. No. : ACL25046  
 Job No. : VC68AC0048  
 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).

**COPY**



Cert. No. : ACL25046  
Job No. : VC68AC0048  
Pages : 3 of 8

Cert. No. : ACL25046  
Job No. : VC68AC0048  
Page : 4 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

### 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	12.6
C - weight	17.4
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
125	0.2	0.2	0.2
1000	0.2	0.2	0.2
8000	0.6	0.6	0.6
Acceptance Limits			± 1.5
			± 1.0
			±5.0

COPY

COPY

T. Petch-

T. Petch-



Cert. No. : ACL25046  
Job No. : VC68AC0048  
Pages : 5 of 8

Cert. No. : ACL25046  
Job No. : VC68AC0048  
Pages : 6 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	±2.0
125	0.0	0.0	±1.5
250	-0.1	-0.1	±1.5
500	0.0	0.0	±1.5
1000	0.0	0.0	±1.0
2000	0.0	0.0	±2.0
4000	0.0	0.0	±3.0
8000	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. 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	129.1	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	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

COPY

Y. Petch

Cert. No. : ACL25046  
Job No. : YC68AC0048  
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	$\pm 1.1$

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	$\pm 1.1$

## 9. Tone burst response

Time Weighting	Tone burst duration, T <sub>b</sub> (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	$\pm 1.0$
Slow	2	8	108.0	108.1	0.1	1.5 ; -5.0
	200	800	127.6	127.7	0.1	$\pm 1.0$
	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	$\pm 1.0$

## 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	$\pm 3.0$
One	133.4	133.3	-0.1	$\pm 3.0$

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	$\pm 2.0$
Positive half cycle	135.4	135.1	-0.3	$\pm 2.0$
Negative half cycle	135.4	135.1	-0.3	$\pm 2.0$

## 11. Overload indication

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

## 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	$\pm 0.3$

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

COPY

T. Petch

COPY

T. Petch

**SOUND LEVEL METER**

**MODEL : NL-43**

**SERIAL No. : 00641701**

Cert. No. : ACL25307  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-43 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00641701 / 206418 / 34665  
**ID No.:** -

**Condition As Found :** GOOD

**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 23 JUNE 2025  
**Calibration Date :** 13 - 14 AUGUST 2025  
**Date of Issue :** 15 AUGUST 2025

**Calibrated by :** Nathakorn Pisulpaisan

**Approved by :** *Wichon B.*  
( Wichok Ekpongpradit )

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.

**COPY**

Cert. No. : ACL25307  
Job No. : VC68AC0160  
Pages : 2 of 8

**Calibration Procedure :** CP-AC-02

### 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL.BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL.BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

**COPY**

Cert. No. : ACL25307  
Job No. : VC68AC0160  
Pages : 3 of 8

Cert. No. : ACL25307  
Job No. : VC68AC0160  
Page : 4 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 or the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

**Result of calibration :**

**1. Absolute sensitivity**

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

**2. Self-generated noise**

2.1 Normal test

Measured Value ( dB )
15.1

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

Frequency Weighting	Weighting ( dB )
A - weight	13.6
C - weight	24.9
Flat	31.0

**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	± 1.5
1000	0.1	0.1	± 1.0
8000	-0.3	-0.3	±5.0

**COPY**

**COPY**



Cert. No. : ACL25307  
Job No. : VC68AC0160  
Pages : 5 of 8

Cert. No. : ACL25307  
Job No. : VC68AC0160  
Pages : 6 of 8

#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

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

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

#### 7. 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	124.1	0.1	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.1	0.1	± 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	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.8	-0.2	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

COPY

Cert. No. : ACL25307

Job No. : VC68AC0160

Pages : 7 of 8

Cert. No. : ACL25307

Job No. : VC68AC0160

Pages : 8 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	28.9	-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	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

## 10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <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	135.1	-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	-0.1	±1.5
89.6	89.5		

## 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

COPY

COPY

**SOUND LEVEL METER**

**MODEL : NL-42A**

**SERIAL No. : 00322746**

Calibration Procedure : CP-AC-01

Equipment :

Manufacturer :

Model :

Serial No.:

ID No.:

SOUND LEVEL METER

RION

NL-42A / Microphone UC-52 / Preamplifier NH-24

00322746 / 196469 / 15478

-

Condition As Found :

GOOD

Customer :

EASTERN THAI CONSULTING 1992 CO., LTD.

SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,

NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

Location :

Ambient Temperature :

Pressure :

Relative Humidity :

( 23.0 ± 3 ) °C

( 101.3 ± 3 ) kPa

( 50.0 ± 20 ) %

Received Date :

Calibration Date :

Date of Issue :

06 JUNE 2025

18 JUNE 2025

20 JUNE 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

Wichok E.

( Wichok Ekpongpradit )

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.

or 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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL_BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL_BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

Cert. No. : ACL25248  
Job No. : VC68AC011  
Pages : 3 of 8

Cert. No. : ACL25248  
Job No. : VC68AC0117  
Page : 4 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

COPY

### Result of calibration :

#### 1. Absolute sensitivity

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

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
15.1

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	17.1
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	0.4	0.4	± 1.5
1000	0.1	0.1	± 1.0
8000	0.8	0.9	±5.0

COPY



Cert. No. : ACL25248  
Job No. : VC68AC0117  
Pages : 5 of 8

Cert. No. : ACL25248  
Job No. : VC68AC0117  
Pages : 6 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
63	-0.1	0.0	-0.1
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1

#### 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	$\pm 0.2$
C - weight	94.0	94.0	0.0	$\pm 0.2$
Flat	94.0	94.0	0.0	$\pm 0.2$

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	$\pm 0.1$
Slow	94.0	94.0	0.0	$\pm 0.1$
Leq	94.0	94.0	0.0	$\pm 0.1$

#### 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	$\pm 0.3$

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

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.0	0.0	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.0	0.0	$\pm 1.1$
84.0	84.0	0.0	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.0	0.0	$\pm 1.1$
69.0	69.0	0.0	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.0	0.0	$\pm 1.1$
54.0	53.9	-0.1	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	44.0	0.0	$\pm 1.1$
39.0	39.0	0.0	$\pm 1.1$
34.0	34.0	0.0	$\pm 1.1$
30.0	29.9	-0.1	$\pm 1.1$
29.0	28.9	-0.1	$\pm 1.1$
28.0	27.9	-0.1	$\pm 1.1$
27.0	26.9	-0.1	$\pm 1.1$
26.0	25.9	-0.1	$\pm 1.1$
25.0	24.9	-0.1	$\pm 1.1$

Cert. No. : ACL25248  
Job No. : VC68AC011  
Pages : 7 of 8

Cert. No. : ACL25248  
Job No. : VC68AC011  
Pages : 8 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	28.9	-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	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lopeak (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	-0.1	±1.5
89.6	89.5		

**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

COPY

COPY

**SOUND LEVEL METER**

**MODEL : NL-42A**

**SERIAL No. : 00322752**



Cert. No. : ACL25266  
Pages : 1 of 8

Cert. No. : ACL25266  
Job No. : VC68AC0096  
Pages : 2 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42A / Microphone UC-52 / Preamplifier NIH-24  
**Serial No.:** 00322752 / 196475 / 15484  
**ID No.:** -

**Condition As Found :** GOOD  
**Customer :** EASTERN THAI CONSULTING 1992 CO., LTD.  
SAHA GROUP INDUSTRIAL PARK, 683 MOO 11,  
NONGKHAM, SIRACHA, CHONBURI 20230 THAILAND.

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

**Received Date :** 26 JUNE 2025  
**Calibration Date :** 08 JULY 2025  
**Date of Issue :** 09 JULY 2025

**Calibrated by :** Nathakorn Pisutpaian

**Approved by :** *Wichok E.*  
( Wichok Ekpongpradit )

**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-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY53220104	EEL.BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY53220076	EEL.BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

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).
- 3.3 Electrical And Electronics Institute (EEI).

Cert.No. : ACL25266  
Job No. : VC68AC009  
Pages : 3 of 8

Cert. No. : ACL25266  
Job No. : VC68AC0096  
Page : 4 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

### 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 )
17.50000003

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

Frequency Weighting	Weighting ( dB )
A - weight	13.6
C - weight	20.1
Flat	25.8

### 3. Acoustical signal tests of frequency weightings

1-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	$\pm 1.5$
1000	-0.3	-0.3	-0.3	$\pm 1.0$
8000	0.8	0.9	0.9	$\pm 5.0$

2000

200



Cert. No. : ACL25266  
Job No. : VC68AC009  
Pages : 5 of 8

Cert. No. : ACL25266  
Job No. : VC68AC009  
Pages : 6 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	±2.0
125	0.0	0.0	±1.5
250	0.0	0.0	±1.5
500	0.0	0.0	±1.5
1000	0.0	0.0	±1.0
2000	0.0	0.0	±2.0
4000	0.0	0.0	±3.0
8000	0.0	0.1	±5.0

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

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

#### 7. 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	29.2	0.2	± 1.1
28.0	28.2	0.2	± 1.1
27.0	27.3	0.3	± 1.1
26.0	26.3	0.3	± 1.1
25.0	25.4	0.4	± 1.1

COPY

Cert. No. : ACL25266  
Job No. : VC68AC009  
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	1.0 ; -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

COPY

Cert. No. : ACL25266  
Job No. : VC68AC009  
Pages : 8 of 8

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lopeak (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	0.0	±1.5
89.5	89.5		

**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

COPY

**NOISE DOSI METER**

**MODEL : CR:110A**

**SERIAL No. : CB0954**

CERTIFICATE OF CALIBRATION

ISSUED BY  
Cirrus Research plc

DATE OF ISSUE  
31 January 2025

CERTIFICATE NUMBER  
231831

CERTIFICATE OF CALIBRATION

Certificate Number:  
231831

Page 2 of 2



Cirrus Research plc

Acoustic House

Bridlington Road

Hunmanby

North Yorkshire

YO14 0PH

United Kingdom

Page 1 of 2

Approved signatory  
N. Smith

Electronically signed:  


Dosimeter : IEC 61252-1993+A1:2000

Instrument information

Manufacturer:  
Model:  
Serial number:  
Firmware version:

Cirrus Research plc  
CR:110A  
CB0954  
5.4

Notes:  
Eastern Thai Consulting 1992 Co., Ltd  
683 Moo 11,  
Sukaphibai 8 Rd.,  
Nongkham,  
Sriracha,

Test summary

Date of calibration:

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

The dosimeter submitted for testing successfully completed the periodic tests of IEC 61252-1993+A1:2000.

The dosimeter submitted for testing conforms to the specifications in IEC 61252-1993+A1:2000.

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	SIGLENT	SDG1032X	SDG1XDDC7R0237
Attenuator	Cirrus Research	ZE:952	78713
Environmental Monitor	Comet	T7510	16966334
doseBadge Reader	Cirrus Research plc	RC:110A	79620

Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

Environmental conditions

The following conditions were recorded at the time of the test:

Before

Pressure: 99.46 kPa

Temperature: 22.3 °C

Humidity: 39.6 %

After

Pressure: 99.51 kPa

Temperature: 22.4 °C

Humidity: 40.2 %

Test results summary

Test	Result
Absolute Acoustic Sensitivity	Complies
Linearity	Complies
Short Duration	Complies
Overload Latching	Complies
Frequency weighting	Complies

COPY

COPY

**NOISE DOSI METER**

**MODEL : CR:110A**

**SERIAL No. : CB0955**



# CERTIFICATE OF CALIBRATION

DATE OF ISSUE 31 January 2025 CERTIFICATE NUMBER 231830

Page 1 of 2

---

Approved signatory  
N.Smith  
Electronically signed:

20

## Test results summary

100

Short Duration	Complies
Overload Latching	Complies
Frequency weighting	Complies

100

**NOISE DOSI METER**

**MODEL : CR:110A**

**SERIAL No. : CB0956**

# CERTIFICATE OF CALIBRATION

DATE OF ISSUE 31 January 2025 CERTIFICATE NUMBER 231840

Page 1 of 2

Approved signatory  
N.Smith

Electronically signed:

(

### Test results summary

Manufacturer:	Cirrus Research plc	Notes:	Eastern Thai Consulting 1992 Co., Ltd
Model:	CR-110A		683 Moo 11, Sukaphibal 8 Rd., Nongkham, Srracha.
Serial number:	CB0956		

## Date of calibration: 29 January 2025

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

The dosimeter submitted for testing successfully completed the periodic tests of IEC 61252-1993+A1:2000.

The dosimeter submitted for testing conforms to the specifications in IEC 61252-1993+A1:2000.

Equipment	Manufacturer	Model	Serial number
Signal Generator	SIGLENT	SDG1032X	SDG1XDDC7R0237
Attenuator	Cirrus Research	ZE:952	78713
Environmental Monitor	Comet	T7510	16966334
doseBadge Reader	Cirrus Research plc	RC:110A	79620

Y2000

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate to the items calibrated. The reported expanded uncertainty is based on a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.

### Environmental conditions

The following conditions were recorded at the time of the test:

**Before** Pressure: 99.30 kPa Temperature: 21.9 °C Humidity: 38.5 %

**After** Pressure: 99.32 kPa Temperature: 22.0 °C Humidity: 38.7 %

### Test results summary

Test	Result
Absolute Acoustic Sensitivity	Complies
Linearity	Complies
Short Duration	Complies
Overload Latching	Complies
Frequency weighting	Complies

100

## **DIGITAL LIGHT METER**

**Model : LX-73**

**Serial No. : R.032544**



## CERTIFICATE OF CALIBRATION

### FOR

NOMENCLATURE : DIGITAL LIGHT METER  
MANUFACTURER : DIGICON  
MODEL / TYPE : LX-73  
SERIAL NO. : R.032544[NO.1]  
CLID. NO. : 252500007  
JOB CONTROL NO. : 250108001550  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : EASTERN THAI CONSULTING 1992 CO., LTD.

683 MOO 11, SUKHAPIBARN 8 RD.,

NONGKHAM, SRIRACHA, CHONBURI 20230

DATE OF RECEIVED : 08 January 2025

DATE OF ISSUED : 14 January 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Chanwit Chongtham  
Calibration Engineer



Approved By :

Mongkol Yotsoontorn  
Authorized Signatory  
14 January 2025



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25001550

F3-011-05/12-23



page 1 of 3



## REPORT OF CALIBRATION

### FOR

NOMENCLATURE : DIGITAL LIGHT METER  
MANUFACTURER : DIGICON  
MODEL / TYPE : LX-73  
SERIAL NO. : R.032544[NO.1]  
DATE OF CALIBRATION : 09 January 2025

#### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$

Relative Humidity :  $(55 \pm 15) \% \text{RH}$

#### PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPEB-18 by comparison with Photometer/Radiometer & Illuminance

Sensor which maintained by the Calibration Laboratory Co., Ltd.

#### REFERENCE STANDARD USED :

Photometer/Radiometer & Illuminance Sensor, Bentham Model ORM400/DH400VL S/N. 27710.27585/3

#### TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Optical Test and Calibration Ltd.

Certificate No. 144408/ABU, Due Date 03 April 2025.

#### UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2.00$  which for a normal distribution corresponds to a coverage probability of approximately 95 %  
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q25001550

F3-011-05/12-23



page 2 of 3





CALIBRATION LABORATORY CO., LTD.

2710-11, 14, 55 Soi Praphan Manukit 29 Yank 4 Prapant Manukit Rd., Lumphini, Bangkok 10230  
Tel: 02-578-0353-4 Fax: 02-573-2672 www.aalaboratory.com E-mail: aal@aalaboratory.com



CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment

CALIBRATION DATA

DIGITAL LIGHT METER RESULT

STD Applied ( lux )	DUC Reading ( lux )	Correction ( lux )	Uncertainty $\pm$ ( % of rdg. )
0.00	0.00	0.00	-
10.0	12.07	-2.07	3.2
50.0	52.9	-2.9	2.6
100.0	104.3	-4.3	2.6
200.0	206.1	-6.1	2.6
300.0	306.1	-6.1	2.6
400	405	-5	2.6
500	508	-8	2.6
1000	1036	-36	2.6
2000	2149	-149	2.6
3000	3190	-190	3.8
4000	4230	-230	3.8
5000	5310	-310	3.8

Note: The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 013 Page 57 of 69

This report is valid for the above stated instrument/s only.

### End of Certificate ###

Certificate No. Q25001550  
F3-011-05/12-23



## **DIGITAL LIGHT METER**

**Model : LX-73**

**Serial No. : S.008890**



**CALIBRATION LABORATORY CO., LTD.**  
2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230  
Tel: 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



**CALIBRATION LABORATORY CO., LTD.**  
2/10-11, 14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230  
Tel: 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail: sale@cal-laboratory.com



## CERTIFICATE OF CALIBRATION

### FOR

NOMENCLATURE : LIGHT METER  
MANUFACTURER : DIGICON  
MODEL / TYPE : LX-73  
SERIAL NO. : S.008890 [NO.6]  
CLID. NO. : 252400286  
JOB CONTROL NO. : 250203012796  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : EASTERN THAI CONSULTING 1992 CO., LTD.  
683 MOO 11, SUKHAPIBARN 8 RD,  
NONGKHAM, SRIRACHA, CHONBURI 20230

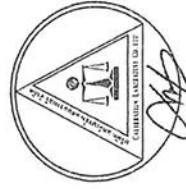
DATE OF RECEIVED : 03 February 2025

DATE OF ISSUED : 05 February 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Suwit Phuanbusabong  
Calibration Engineer



Approved By :

Mongkol Yotsoontorn  
Authorized Signatory  
05 February 2025



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25012796  
F3-011-05/12-23



page 1 of 3

## REPORT OF CALIBRATION

### FOR

NOMENCLATURE : LIGHT METER  
MANUFACTURER : DIGICON  
MODEL / TYPE : LX-73  
SERIAL NO. : S.008890 [NO.6]  
DATE OF CALIBRATION : 04 February 2025

#### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$  Relative Humidity :  $(55 \pm 15) \% \text{RH}$

#### PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPEE-18 by comparison with Photometer/Radiometer & Illuminance Sensor which maintained by the Calibration Laboratory Co., Ltd.

#### REFERENCE STANDARD USED :

Photometer/Radiometer & Illuminance Sensor, Bentham Model ORM400/DH400VL SN. 27710,27585/3.

#### TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Optical Test and Calibration Ltd. Certificate No. 144408/ABU, Due Date 03 April 2025.

#### UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2.00$  which for a normal distribution corresponds to a coverage probability of approximately 95 %. It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02:2022)"

Certificate No. Q25012796  
F3-011-05/12-23

page 2 of 3





CLC  
Accredited  
ISO/IEC 17025

# CALIBRATION LABORATORY CO., LTD.

2/10-11/14/55 Soi Prasert Manukit 29 Yaek 4 Prasert Manukit Rd. Ladphrae Bangkok 10230  
Tel. 02-576-0353-4 Fax. 02-576-2672 www.ca-laboratory.com E-mail sale@ca-laboratory.com



CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment

## CALIBRATION DATA

### LIGHT METER RESULT

STD Applied ( lux )	DUC Reading ( lux )	Correction ( lux )	Uncertainty $\pm$ ( % of rdg. )
0.00	0.00	0.00	-
10.00	10.05	-0.05	3.2
50.0	50.5	-0.5	2.6
100.0	100.3	-0.3	2.6
200.0	199.7	+0.3	2.6
300.0	299.8	+0.2	2.6
400.0	398.9	+1.1	2.6
500	511	-11	2.6
1000	1013	-13	2.6
2000	2053	-53	2.6
3000	3071	-71	3.8
4000	4080	-80	3.8
5000	5080	-80	3.8

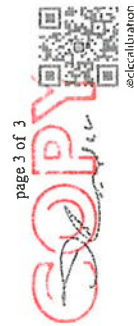
Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 014 Page 56 of 68

This report is valid for the above stated instrument/s only.

### End of Certificate ###

Certificate No. Q25012796

F3-011-05/12-23



#### ภาคผนวกที่ 4

เอกสาร Detection Limit ของรายการทดสอบ



Rev.3 วันที่ 21/6/2024 แก้ไข Detection Limit ของโลหะหนักโดยรายงานหน่วย mg/m3 ทุกพารามิเตอร์เพื่อให้สอดคล้อง กับมาตรฐาน

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality

ตารางที่ 1 สรุปขั้นตอนการเก็บตัวอย่างและความสามารถในการทดสอบด้วยห้องปฏิบัติการ [ฉบับที่ 5 ประเภทตัวอย่างระบบอุตสาหกรรม](#)

ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality									
Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
แผนภูมิปฏิบัติการภาคสนาม									
1	Smoke density (Opacity)	Ringelmann' s method	U.S. EPA Method 9 / Ringelmann' s Chart	-	-	-	%	2	
2	Oxide of Nitrogen	Chemiluminescence Method	U.S. EPA Method 7E / Nitrogen dioxide Analyzer	-	-	0.1 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
3	Sulfur Dioxide	UV Fluorescence Method	U.S. EPA Method 6C / Sulfur dioxide Analyzer	-	-	0.4 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
4	Carbon Monoxide	Bag,Non-Dispersive Infrared Method	U.S. EPA method 10 / Carbon monoxide analyzer	-	-	0.1 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
ส่วนงานทดสอบพื้นฐาน									
1	Hydrogen Sulfide (H <sub>2</sub> S)	Absorption, Iodometric Method	U.S. EPA Method 11 / Iodometric			8.0 6.0	mg / m <sup>3</sup> ppm	1	
2	Sulfur Dioxide (SO <sub>2</sub> )	Absorption Barium Thorin Titrimetric Method	U.S. EPA Method 6 / Titration	0.03 m <sup>3</sup>	Isokinetic (30 min)	1.3 0.5	mg / m <sup>3</sup> ppm	1	
3	Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )	Isokinetic, Barium Thorin Titrimetric Method	U.S. EPA Method 8 / Titration	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.05 0.01	mg / m <sup>3</sup> ppm	2	
4	Total Particulate Matter (TSP)	Isokinetic, Sampling / Gravimetric Method	U.S. EPA Method 5 / Gravimetric Method	-	-	0.1	mg / m <sup>3</sup>	1	
ส่วนงานเครื่องมือทดสอบ									
1	Oxide of Nitrogen (Nitrogen Dioxide ;	Chemical Absorption, Colorimetric Method	U.S. EPA Method 7 / Spectrophotometer	2.0 L	Non-Isokinetic (30 min)	2.0 1.0	mg / m <sup>3</sup> ppm	1	
2	Xylene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	2.05 0.47	mg / m <sup>3</sup> ppm	2	SKC' Cat. No. 226-09
3	Vanadium (V)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
4	Tin (Sn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.010	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
5	Selenium (Se)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.010	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
6	Antimony (Sb)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.010	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
7	Arsenic (As)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.010	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
8	Cadmium (Cd)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
9	Chromium (Cr)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
10	Copper (Cu)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
11	Cobalt (Co)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
12	Lead and Inorganic Lead (Pb)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
13	Manganese (Mn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
14	Nickel (Ni)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
15	Mercury (Hg)	Isokinetic, Sampling,Cold Vapor Technique-AAS Method	U.S. EPA Method 101 / AAS	0.053 m3	Isokinetic (1.5 L/min)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat No. GC5090 MM

Rev.3 วันที่ 21/6/2024 แก้ไข Detection Limit ของโลหะหนักโดยรายงานหน่วย mg/m3 ทุกพารามิเตอร์เพื่อให้สอดคล้อง กับมาตรฐาน

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

ประเภทตัวอย่าง : อากาศในป่องระบาย - Stack Air Quality

ตารางที่ 2 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ **ที่ไม่ได้รับทะเบียนกับกรมโรงงานอุตสาหกรรม**

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
ชนิดปฏิบัติการภาคสนาม									
1	Sampling and Traverse point	U.S. EPA Recommend (Method 1)	U.S. EPA Method 1 / Calculation	-	-	-	-	-	
2	Velocity and Volumetric Flow rate		U.S. EPA Method 2 / Calculation	-	-	-	-	-	
3	Oxygen	Electrochemical Sensor	Modified U.S. EPA 3 / Electrochemical Sensor	-	-	0-20.9	%	1	
4	Moisture Content		U.S. EPA Method 4 / Calculation	-	-	-	-	2	
5	Carbon dioxide (CO <sub>2</sub> )	Electrochemical Sensor	Modified U.S. EPA 3 / Electrochemical Sensor	-	-	0-20.9	%	2	
ส่วนจมน้ำทดสอบพื้นฐาน									
1	PM10,PM2.5	Isokinetic, Sampling / Gravimetric Method	U.S. EPA Method 201A / Gravimetric Method	-	-	0.1	mg / m <sup>3</sup>	1	
ส่วนจมน้ำเครื่องมือทดสอบ									
1	Aluminium (Al)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
2	Barium (Ba)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
3	Calcium (Ca)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.100	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
4	Iron (Fe)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
5	Magnesium (Mg)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.100	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
6	Beryllium (Be)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
7	Silver (Ag)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
8	Sodium (Na)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.100	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
9	Zinc (Zn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
10	Acetone	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	1.88 0.79	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
11	Benzene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	1.68 0.52	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
12	Cyclohexanone	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	2.26 0.56	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
13	Ethanol (Ethyl alcohol)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	1.88 1.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
14	Ethylbenzene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	2.07 0.48	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
15	Ethylacetate	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	4.32 1.20	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
16	Hexane	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	4.23 1.20	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
17	Isopropanol (Isopropyl alcohol); IPA	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	1.87 0.76	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
18	Methanol (Methyl alcohol)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	0.94 0.72	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
19	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	1.92 0.65	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
20	Styrene	Sorbent Adsorption, Gas Chromatography Method	U.S. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	2.16 0.51	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
21	Toluene	Sorbent Adsorption, Gas Chromatography Method	U.S. EPA Method 18 / GC-FID	0.21 m <sup>3</sup>	0.7 L/min (30 min)	2.07 0.55	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
22	Methylcyclohexane	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-23 L	0.10 L/min (1 hr)	4.02 1.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
23	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	11.88 3.92	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
24	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	3.08 0.86	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
25	Dichloromethane	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	3.16 0.91	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
26	1-Butanol /n-butyl alcohol	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.31 0.76	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
27	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.31 0.76	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
28	Isobutyl alcohol (IBA)	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.29 0.76	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
29	Thallium (Tl)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.010	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
30	Ketones	Sorbent Adsorption, Gas Chromatography Method	NIOSH2555 (P.1-5) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	1.88 0.79	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
31	n-Heptane	Sorbent Adsorption, Gas Chromatography Method	NIOSH1500 (P.1-8) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	3.89 0.95	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
32	n-Butyl acetate	Sorbent Adsorption, Gas Chromatography Method	NIOSH 1450(P.1-6) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	4.75 1.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
33	n-Pentane	Sorbent Adsorption, Gas Chromatography Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	1.50 0.51	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
34	Chloroform	Sorbent Adsorption, Gas Chromatography Method	NIOSH1003 (P.1-7) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	2.82 0.58	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
35	Chlorobenzene	Sorbent Adsorption, Gas Chromatography Method	NIOSH1003 (P.1-7) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	2.64 0.57	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-09
36	Formaldehyde	Sorbent Adsorption, Gas Chromatography Method	NIOSH2541 (P.1-5) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	0.31 0.25	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-118
37	Hydrogen chloride	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.015 0.010	mg / m <sup>3</sup> ppm	3	0.1 N H2SO4 / 0.1 N NaOH
38	Hydrogen fluoride	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.012 0.015	mg / m <sup>3</sup> ppm	3	0.1 N H2SO4 / 0.1 N NaOH
39	Nitric	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.029 m3	1 L/min (30 min)	0.026 0.010	mg / m <sup>3</sup> ppm	3	Milli-Q Water
40	Chlorine	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.029 0.010	mg / m <sup>3</sup> ppm	3	0.1 N H2SO4 / 0.1 N NaOH
41	Molybdenum (Mo)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
42	Titanium (Ti)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
43	Boron (B)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
44	Silicon (Si)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.005	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM
45	Potassium (K)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m <sup>3</sup>	Isokinetic (30 min)	0.100	mg / m <sup>3</sup>	3	Advantage MFS Cat No. GC5090 MM

1. Method of Air Sampling and Analysis, APHA Intersociety Committee, 2017
2. NIOSH Manual of Analytical Methods (NMAM)
3. Code of Federal Regulation, U.S. EPA., 40 CFR Part 50, Part 60, 2000
4. Occupational Health and Safety Management System(OSHA) Analytical Methods Manual
5. International Standard Organization. ISO 11204:1995
6. Compendium of Methods for Determination of Inorganic Compound in Ambient Air, U.S. EPA., 1995
7. Annual Book of ASTM Standard, Section 11, 2001

(ประเภทตัวอย่าง : อากาศในบรรยากาศโดยทั่วไป - Ambient Air Quality)

[illegible]

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
2	Sulfur Dioxide (SO <sub>2</sub> )	Pararosaniline Method	U.S. EPA 40 CFR Part 50 Appendix A / Spectrophotometer	288 L	0.2 L/min (24 hrs)	0.01	mg / m <sup>3</sup>	2	
3	Aluminium (Al)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
4	Antimony (Sb)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
5	Arsenic (As)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
6	Barium (Ba)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
7	Cadmium (Cd)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
8	Calcium (Ca)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
9	Chromium (Cr)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
10	Copper (Cu)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
11	Iron (Fe)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
12	Lead (Pb)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
13	Magnesium (Mg)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
14	Manganese (Mn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
15	Mercury (Hg)	Filtration, AAS Method	U.S. EPA Method IO-3.4 / High Volume - AAS	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
16	Nickel (Ni)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
17	Potassium (K)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
18	Sodium (Na)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
19	Tin (Sn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
20	Titanium (Ti)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
21	Vanadium (V)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
22	Zinc (Zn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
23	Selenium (Se)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m <sup>3</sup>	39-60 ft <sup>3</sup> /min (24 hrs)	0.0001	mg / m <sup>3</sup>	4	Advantage MFS Cat. No. GA55 8 x 10 *
24	Acetone	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.14 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
25	Benzene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.12 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-02
26	Cyclohexanone	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.16 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-04
27	Ethanol (Ethyl alcohol)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	288 L	0.10 L/min (24 hrs)	0.14 0.07	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-05



Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
28	Ethylacetate	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.32 0.09	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-06
29	Ethylbenzene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.03	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-07
30	Hexane	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.32 0.09	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-08
31	Isopropanol (Isopropyl alcohol) ; IPA	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	288 L	0.10 L/min (24 hrs)	0.14 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-09
32	Methanol (Methyl alcohol)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.07 0.05	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-10
33	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.14 0.05	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-11
34	Styrene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.16 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-12
35	Toluene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-13
36	Xylene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.03	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-14
37	Methylcyclohexane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	0.32 0.08	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
38	Methyl acetate	Sorbent Adsorption, GC Method	NIOSH 1458 (P.1-8) / PS pump / GC-FID	0.2-10 L	0.10 L/min (1 hr)	0.61 0.20	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
39	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, GC Method	NIOSH 1610 (P.1-4) / PS pump / GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	0.12 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
40	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, GC Method	NIOSH 1615 (P.1-4) / PS pump / GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	0.13 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
41	Dichloromethane	Sorbent Adsorption, GC Method	NIOSH 1005 (P.1-4) / PS pump / GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	0.23 0.07	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
42	1-Butanol /n-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
43	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
44	Isobutyl alcohol (IBA)	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
45	Methyl Isobutyl Ketone (MIBK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	0.14 0.03	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
46	Ketones	Sorbent Adsorption, GC Method	NIOSH 2555 (P.1-5) / PS pump / GC-FID	0.5-10L	0.01-0.20 L/min (1 hr)	0.14 0.06	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
47	n-Butyl acetate	Sorbent Adsorption, GC Method	NIOSH 1450 (P.1-6) / PS pump / GC-FID	1-10L	0.01-0.20 L/min (1 hr)	0.38 0.08	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
48	n-Pentane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	0.11 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
49	Chloroform	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1-50L	0.01-0.20 L/min (1 hr)	0.21 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
50	Chlorobenzene	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1.5-40L	0.01-0.20 L/min (1 hr)	0.19 0.04	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
51	Formaldehyde	Sorbent Adsorption, GC Method	NIOSH 2541 (P.1-5) / PS pump / GC-FID	1-36L	0.01-0.10 L/min (1 hr)	0.01 0.01	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-118
52	Hydrogen chloric	Sorbent Adsorption, IC Method	OSHA ID-1748G / PS pump / IC	1-7.5 L	0.20 L/min (24 hr)	0.015 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
53	Hydrogen Bromide	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.033 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
54	Sulfuric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC NIOSH 7908 / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.040 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03 Fier (PTFE)
55	Phosphoric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC NIOSH 7908 / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.040 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03 Fier (PTFE)
56	Nitric	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.026 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
57	Chlorine	Sorbent Adsorption, IC Method	OSHA ID-202 / PS pump / IC	14 L	0.20 L/min (24 hr)	0.029 0.010	mg / m <sup>3</sup> ppm	3	0.02% KI in Buffer solution
58	Ammonia (NH <sub>3</sub> )	Sorbent Adsorption, IC Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.20 L/min (120min)	0.200 0.280	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-06
59	Hydrogen fluoride	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	60 L	0.2 L/min (60min)	0.008 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03

เอกสารอ้างอิง

1. Method of Air Sampling and Analysis, APHA Intersociety Committee, 2017
2. NIOSH Manual of Analytical Methods (NMAM)
3. Code of Federal Regulation, U.S. EPA , 40 CFR Part 50, Part 60, 2000
4. Occupational Health and Safety Management System(OSHA) Analytical Methods Manuel
5. International Standard Organization, ISO 11204:1995
6. Compendium of Methods for Determination of Inorganic Compound in Ambient Air, U.S. EPA , 1999
7. Annual Book of ASTM Standard, Section 11, 2001

Rev.3 วันที่ 21/6/2024 แก้ไข Detection Limit ของโลหะหนักโดยรายงานหน่วย mg/m3 ทุกพารามิเตอร์เพื่อให้สอดคล้อง กับมาตรฐาน

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

(ประเภทตัวอย่าง : อากาศในบริเวณการทำงาน - Workplace Air Quality)									
Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
หมวกปฏิบัติกรกอนาม									
1	Illumination	Lux Meter	HS C 1906 / Lux meter		-	0-5000	lux	-	
2	Sound (Leq, Lmin, Lmax, Ldn, Lp)	Integrated Sound Level Method	ISO 11202 / Sound Level Meter		-	40 - 140	dB (A)	1	
3	Noise Octave band	Integrated Sound Level Method	AS/NZS 4476 1997 / Sound Level Meter		-	40 - 140	dB (A)	1	1/3 Octave band หรือ 1/1 Octave band
4	Noise dose	Integrated Sound Level Method	BS6402 / Noise Dosemeter		-	0 - 9999	% Dose	2	
5	Carbon Monoxide (CO)	Non-Dispersive Infrared Photometric Method	U.S. EPA 10 (P.1-5) Carbon Monoxide Analyzer		-	0.1 - 100	ppm	1	
6	Ozone (O <sub>3</sub> )	UV Fluorescence Method	U.S. EPA method / Ozone Analyzer		-	0.1 - 100	ppm	2	
7	Heat Stress	WBGT Method	ACGIH / Grove + DI + Thermometer / calculation	-	-	0 - 100	oC	2	
ส่วนงานทดสอบพื้นฐาน									
1	Total Dust (TD)	Filtration, Gravimetric Method	NIOSH 0500 (P.1-3) / PS pump / Gravimetric	7-133 L	2 L/min (1 hr)	0.8	mg / m <sup>3</sup>	1	SKC Cat No. 225-8-01
2	Respirable Dust (RD)	Cyclone - Filtration, Gravimetric Method	NIOSH 0600 (P.1-3) / PS pump cyclone / Gravimetric	20-400 L	1.70 L/min (1 hr)	0.5	mg / m <sup>3</sup>	1	SKC Cat No. 225-8-01
3	NaOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.4	mg / m <sup>3</sup>	1	SKC Cat No. 225-17-01
4	KOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.6	mg / m <sup>3</sup>	1	SKC Cat No. 225-17-01
5	LiOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.2	mg / m <sup>3</sup>	1	SKC Cat No. 225-17-01
ส่วนงานเครื่องมือทดสอบ									
1	Ammonia	Impingement Absorption - Colorimetric Method	Modified NIOSH 6015(P.1-7) / Spectrophotometer	0.1-96 L	1 L/min (1 hr)	0.01	mg / m <sup>3</sup>	2	
2	Nitrogen Dioxide	Impingement Absorption, Spectrophotometer Method	APHA 817(P.1-3) / Spectrophotometer	7.5 - 10 L	0.5 L/min (15-20 min)	0.01	ppm	2	
3	Sulfur Dioxide	Impingement Absorption, Titrimetric Method	APHA 823(P.1-3) / Titration	26 L	0.21 L/min (2 hrs)	0.30 0.11	mg / m <sup>3</sup> ppm	2	
4	P,P'-diphenylmethane diisocyanate(MDI) (MDI)	Impingement Absorption, Spectrophotometer Method	APHA 831(P.1-3) / Spectrophotometer	20 L	1 L/min (20 min)	0.002	ppm	2	
5	Aluminum (Al)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-100 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
6	Antimony (Sb)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.021	mg / m <sup>3</sup>	3	SKC Cat No. 225-5

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
7	Arsenic & Compound (as As)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.010	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
8	Barium (Ba)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
9	Cadmium & Compounds (as Cd)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-1500 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
10	Calcium & Compounds (as Ca)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	20-400 L	2 L/min (1 hr)	0.208	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
11	Chromium & Compounds (as Cr)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
12	Copper (Cu) (Dust & Fume)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-1500 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
13	Iron & Compounds (as Fe)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
14	Lead (Pb)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
15	Magnesium (Mg)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	6-67 L	2 L/min (1 hr)	0.208	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
16	Manganese (Mn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-200 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
17	Mercury (Hg)	Filtration - AAS Method	NIOSH 6009(P.1-5) / PS pump / AAS	2 – 100 L	0.2 L/min (1 hr)	0.00002	mg / m <sup>3</sup>	5	SKC Cat No. 225-5
18	Nickel & Compounds (as Ni)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
19	Selenium (Se)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	13-2000 L	2 L/min (1 hr)	0.021	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
20	Silver (Ag)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	250-2000 L	2 L/min (2-17 hr)	0.010	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
21	Sodium (Na)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	13-2000 L	2 L/min (1 hr)	0.208	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
22	Tin (Sn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.021	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
23	Titanium (Ti)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
24	Vanadium (V)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
25	Zinc & Compounds (Zn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
26	Acetone	Sorbent Adsorption, GC Method	NIOSH 1300 (P.1-5) / PS pump / GC-FID	0.5-3 L	0.10 L/min (30 min)	13.17 5.54	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
27	Benzene	Sorbent Adsorption, GC Method	NIOSH 1501(P.1-7) / PS pump / GC-FID	5-30 L	0.10 L/min (1 hr)	2.93 0.92	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
28	Cyclohexanone	Sorbent Adsorption, GC Method	NIOSH 1300(P.1-5) / PS pump / GC-FID	1-10 L	0.10 L/min (1 hr)	3.96 0.99	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
29	Ethanol (Ethyl alcohol)	Sorbent Adsorption, GC Method	NIOSH 1400(P.1-4) / PS pump / GC-FID	12 L	0.10 L/min (1 hr)	3.29 1.75	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
30	Ethylacetate	Sorbent Adsorption, GC Method	NIOSH 1457 (P.1-4) / PS pump / GC-FID	0.1-10 L	0.10 L/min (1 hr)	7.21 2.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
31	Ethylbenzene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-24 L	0.10 L/min (1 hr)	3.63 0.83	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
32	Hexane	Sorbent Adsorption, GC Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	4 L	0.10 L/min (1 hr)	7.05 2.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
33	Isopropanol (Isopropyl alcohol) ; IPA	Sorbent Adsorption, GC Method	NIOSH 1400(P.1-4) / PS pump / GC-FID	12 L	0.10 L/min (1 hr)	3.28 1.33	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
34	Methanol (Methyl alcohol)	Sorbent Adsorption, GC Method	OSHA 910(P.1-10) / PS pump / GC-FID	1-5 L	0.10 L/min (30 min)	3.96 3.02	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-82
35	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	3.35 1.14	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-81A
36	Methyl Isobutyl Ketone (MIBK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	3.34 0.81	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
37	Styrene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-24 L	0.10 L/min (1 hr)	3.78 0.89	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
38	Toluene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-8 L	0.10 L/min (1 hr)	3.63 0.96	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
39	Xylene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	3.58 0.83	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
40	Cumene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	3.60 0.73	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
41	Methylcyclohexane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	7.23 1.80	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
42	Methyl acetate	Sorbent Adsorption, GC Method	NIOSH 1458 (P.1-8) / PS pump / GC-FID	0.2-10 L	0.10 L/min (1 hr)	9.09 3.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
43	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, GC Method	NIOSH 1610 (P.1-4) / PS pump / GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	11.88 3.92	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
44	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, GC Method	NIOSH 1615 (P.1-4) / PS pump / GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	3.08 0.86	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
45	Dichloromethane or Methylene chloride	Sorbent Adsorption, GC Method	NIOSH 1005 (P.1-4) / PS pump / GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	22.1 6.36	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
46	1-Butanol /n-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.86 1.60	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
47	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.86 1.60	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
48	Isobutyl alcohol (IBA)	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.81 1.59	mg / m <sup>3</sup> ppm	2	SKC Cat. No. ST 226-01
49	Beryllium (Be)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	1250-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
50	Cobalt (Co)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-2000 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
51	Molybdenum (Mo)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-67 L	2 L/min (1 hr)	0.004	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
52	Thallium (Tl)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-2000 L	2 L/min (1 hr)	0.021	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
53	Silicon (Si)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.010	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
54	Potassium (K)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.208	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
55	Ketones	Sorbent Adsorption, GC Method	NIOSH 2555 (P.1-5) / PS pump / GC-FID	0.5-3.0 L	0.01-0.20 L/min (1 hr)	13.17 5.54	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01
56	n-Heptane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	6.97 1.70	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01
57	n-Butyl acetate	Sorbent Adsorption, GC Method	NIOSH 1450(P.1-6) / PS pump / GC-FID	1-10 L	0.01-0.20 L/min (1 hr)	8.55 1.80	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01
58	n-Pentane	Sorbent Adsorption, GC Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	2.63 0.89	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
59	Chloroform	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1-50 L	0.01-0.20 L/min (1 hr)	4.93 1.01	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01
60	Chlorobenzene	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1.5-40L	0.01-0.20 L/min (1 hr)	4.63 1.00	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-01
61	Formaldehyde	Sorbent Adsorption, GC Method	NIOSH 2541 (P.1-5) / PS pump / GC-FID	1-36L	0.01-0.10 L/min (1 hr)	0.12 0.10	mg / m <sup>3</sup> ppm	2	SKC Cat. No. 226-118 รพฐรณ DL:1/2/24
62	Hydrogen chloride	Sorbent Adsorption, IC Method	OSHA ID-174SG / PS pump / IC	100 L	0.5 L/min (15 min)	0.015 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
63	Hydrogen Bromide	Sorbent Adsorption, IC Method	OSHA ID16SSG / PS pump / IC	96 L	0.2 L/min (60min)	0.033 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
64	Sulfuric Acid	Sorbent Adsorption, IC Method	OSHA ID16SSG / PS pump / IC	96 L	0.2 L/min (60min)	0.040 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
65	Phosphoric Acid	Sorbent Adsorption, IC Method	OSHA ID16SSG / PS pump / IC	96 L	0.2 L/min (60min)	0.040 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
66	Ammonia (NH <sub>3</sub> )	Sorbent Adsorption, IC Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.2 L/min (120min)	0.200 0.280	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-06
67	Nitric	Sorbent Adsorption, IC Method	OSHA ID16SSG / PS pump / IC	96 L	0.2 L/min (60min)	0.026 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
68	Chlorine	Sorbent Adsorption, IC Method	OSHA ID-202 / PS pump / IC	60 L	0.5 L/min (60min)	0.029 0.010	mg / m <sup>3</sup> ppm	3	0.02% KI in Buffer solution
69	Hydrogen fluoride	Sorbent Adsorption, IC Method	OSHA ID16SSG / PS pump / IC	96 L	0.2 L/min (60min)	0.008 0.010	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-03
70	Phosphorus (P)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.042	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
71	Boron (B)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.010	mg / m <sup>3</sup>	3	SKC Cat No. 225-5
72	Sulfur dioxide	Filtration, IC Method	NIOSH 6004 / PS pump / IC	4-200 L	1 L/min (120min)	0.015 0.006	mg / m <sup>3</sup> ppm	3	Treated Filter
73	Sulfuric Acid	Filtration, IC Method	NIOSH 7908 / PS pump / IC	15-2000 L	1 L/min (120min)	0.040 0.010	mg / m <sup>3</sup> ppm	3	Fiter (PTFE)
74	Phosphoric Acid	Filtration, IC Method	NIOSH 7908 / PS pump / IC	15-2000 L	1 L/min (120min)	0.040 0.010	mg / m <sup>3</sup> ppm	3	Fiter (PTFE)
75	Ammonium NH <sub>4</sub> <sup>+</sup>	Sorbent Adsorption, IC Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.2 L/min (120min)	0.017 0.023	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-06

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
76	Ammonium Chloride (NH <sub>4</sub> Cl) as NH <sub>4</sub> <sup>+</sup>	Sorbent Adsorption, IC <sup>-</sup> Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.2 L/min (120min)	0.049 0.067	mg / m <sup>3</sup> ppm	3	SKC Cat. No. 226-10-06

## เอกสารอ้างอิง

1. Method of Air Sampling and Analysis, APHA Intersociety Committee, 1997
2. NIOSH Manual of Analytical Method, 4<sup>th</sup> Edition, 1994
3. Code of Federal Regulation, U.S. EPA., 40 CFR Part 50, Part 60, 2000
4. OSHA Analytical Methods Manual, 2<sup>nd</sup> Edition, U.S. Department of Labor, 1992
5. International Standard Organization, ISO 11204:1995
6. Compendium of Methods for Determination of Inorganic Compound in Ambient Air, U.S. EPA., 1999
7. Annual Book of ASTM Standard, Section 11, 2001

Rev.5- 20/1/2569

## การตรวจวิเคราะห์คุณภาพน้ำ – ภาคของ (Water – Solid wastes Quality Analysis)

ตารางที่ 4. สรุปข้อมูลค่าความเข้มข้นและความสามารถในการทดสอบค่าของสิ่งปนเปื้อน **ฉบับนี้จะเป็นการเปรียบเทียบระหว่างมาตรฐาน**

(ประเภทตัวอย่าง : น้ำเสีย(ขึ้นอยู่กับโรงงาน), น้ำดื่มอุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล )

หมายเหตุ : ส่วนงานที่ออกทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Arsenic (As)	Continuous Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method Part 3114 B and 3114C / AAS	Plastic	500	0.0005	0.0020	mg/l as As	4	น้ำเสีย MDL/LOQ = 1.00/2.00 ug/l
2	Barium (Ba)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Ba	2	น้ำเสีย MDL/LOQ = 1/30 ug/l
3	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Cd	2	น้ำเสีย MDL/LOQ = 1/30 ug/l
4	Chromium (Cr)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.03	mg/l as Cr	2	น้ำเสีย MDL/LOQ = 0.0001/0.003 mg/l
5	Color	ADMI Weighted-Ordinate Spectrophotometer Method	Standard Method part 2120 F / Spectrophotometer	Plastic	500	10	20	ADMI	0	น้ำเสีย MDL/LOQ = 2/30 ug/l
6	Chromium Hexavalence (Cr <sup>6+</sup> )	Filtration,Colorimetric Method	Standard Method part 3500-Cr B / Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr <sup>6+</sup>	3	น้ำเสีย MDL/LOQ = 3.00/50.0 ug/l
7	Copper (Cu)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Cu	2	น้ำเสีย MDL/LOQ = 1/30 ug/l
8	Cyanide (CN <sup>-</sup> )	Distillation, Colorimetric Method	Standard Method part 4500 CN- C/E Spectrophotometer	Plastic	500	0.008	0.020	mg/l	3	น้ำเสีย MDL/LOQ = 8/20 ug/l
9	Formaldehyde	Distillation, Colorimetric Method	คู่มือตรวจหาน้ำเสีย,ตามกวดำรงารบซึ่งนอกเหนือไปจากที่ทาง	Plastic	100	0.20	0.50	mg/l	2	
10	Lead (Pb)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.03	mg/l as Pb	2	น้ำเสีย MDL/LOQ = 2/30 ug/l
11	Manganese (Mn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.0005	0.03	mg/l as Mn	2	น้ำเสีย MDL/LOQ = 0.0017/0.010 mg/l
12	Mercury (Hg)	Digestion, Cold Vapor Atomic Absorption Spectrometric Method	Standard Method part 3112 B / AAS	Plastic	500	0.0005	0.0010	mg/l as Hg	4	น้ำเสีย MDL/LOQ = 20/30 ug/l
13	Nickel (Ni)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Ni	2	
14	Phenols	Distillation, Direct Photometric Method	Standard Method part 5510 D / Spectrophotometer	Plastic	500	0.002	0.005	mg/l	3	
15	Trivalent Chromium (Cr <sup>3+</sup> )	Digestion,Direct Aspiration-AAS Method; Filtration,Colorimetric Method,Calculation	Standard Method part 3500-Cr B & part 3111B / AAS	Plastic	500	0.05	0.10	mg/l	2	
16	Trivalent Chromium (Cr <sup>3+</sup> )	Digestion,ICP-OES Method; Filtration,Colorimetric Method,Calculation	Standard Method part 3500-Cr B & part 3120B / ICP-OES	Plastic	500	0.002	0.03	mg/l	2	



Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
17	Zinc (Zn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.005	0.03	mg/l as Zn	2	if 17E10 MDL/LOQ = 5/30 ug/l
18	Free Chlorine	DPD Colorimetric Method	Standard Method part 4500 Cl G / Spectrophotometer	Plastic	500	0.03	0.05	mg/l	2	
19	Selenium (Se)	Digestion, Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method part 3030F, 3114 B and 3114C / AAS	Plastic	500	0.0005	0.0020	mg/l	4	
20	สารพิษฆ่าแมลง (Pesticide)	Liquid-Liquid Extraction Gas Chromatography	Standard Method part 6630B/GC and Standard Method part 6410B/GC-MS	Glass	2500	0.03	0.05	ug/l	2	
	- alpha - BHC					0.02	0.05	ug/l	2	
	- beta - BHC					0.03	0.05	ug/l	2	
	- gamma - BHC					0.03	0.05	ug/l	2	
	- delta - BHC					0.03	0.05	ug/l	2	
	- Heptachlor					0.03	0.05	ug/l	2	
	- Aldrin					0.03	0.05	ug/l	2	
	- Heptachlor epoxide					0.03	0.05	ug/l	2	
	- Endosulfan I					0.03	0.05	ug/l	2	
	- p,p - DDE					0.03	0.05	ug/l	2	
	- Dieldrin					0.03	0.05	ug/l	2	
	- Endrin ketone					0.03	0.05	ug/l	2	
	- Endosulfan II					0.03	0.05	ug/l	2	
	- p,p - DDD					0.03	0.05	ug/l	2	
	- Endrin Aldehyde					0.03	0.05	ug/l	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
	- Endosulfan Sulfate					0.03	0.05	ug/l	2	
	- trans Chlordane					0.03	0.05	ug/l	2	
	- cis Chlordane					0.03	0.05	ug/l	2	
	- DDT		Standard Method part 6410B/GC-MS			0.03	0.05	ug/l	2	
	- Endrin					0.05	0.10	ug/l	2	
	- Methoxychlor					0.03	0.05	ug/l	2	

การตรวจวิเคราะห์คุณภาพน้ำ – การทดสอบ (Water – Solid wastes Quality Analysis)

ตารางที่ 6 ตารางข้อมูลของวิธีการวิเคราะห์และควบคุมคุณภาพน้ำตามมาตรฐานของกรมส่งเสริมการค้าระหว่างประเทศ (กรมส่งเสริมการค้าระหว่างประเทศ)

(หน่วยวัดตัวอย่าง : น้ำ, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม, น้ำดื่ม)

หมายเหตุ : ส่วนประกอบอื่นของตัวอย่าง

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sb	2	
2	Aluminum (Al)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.022	0.10	mg/l as Al	2	
3	Boron (B)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as B	2	
4	Calcium (Ca)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Ca	2	
5	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.0001	0.003	mg/l as Cd	3	น้ำดื่ม
6	Cobalt (Co)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Co	2	
7	Copper	Spectrophotometric Method	Standard Method part 2120 C / Spectrophotometer	Plastic	500	0.50	1.00	Pb-Cu	2	
8	Iron (Fe)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.002	0.03	mg/l as Fe	2	
9	Lead (Pb)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.0017	0.010	mg/l as Pb	3	น้ำดื่ม
10	Magnesium (Mg)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Mg	2	
11	Molybdenum (Mo)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.002	0.02	mg/l as Mo	2	
12	Nitrite (NO <sub>2</sub> <sup>-</sup> )	Colorimetric Method	Standard Method part 4500-NO <sub>2</sub> B / Spectrophotometer	Plastic	500	0.003	0.030	mg/l as NO <sub>2</sub> <sup>-</sup>	3	
13	Nitrite-Nitrogen (NO <sub>2</sub> <sup>-</sup> -N)	Colorimetric Method	Standard Method part 4500-NO <sub>2</sub> B / Spectrophotometer	Plastic	500	0.001	0.010	mg/l as NO <sub>2</sub> <sup>-</sup> -N	3	
14	Nitrate (NO <sub>3</sub> <sup>-</sup> )	Colorimetric Method	Standard Method part 4500-NO <sub>3</sub> B / Spectrophotometer	Plastic	500	0.09	0.44	mg/l as NO <sub>3</sub> <sup>-</sup>	2	
15	Nitrate-Nitrogen (NO <sub>3</sub> <sup>-</sup> -N)	Colorimetric Method	Standard Method part 4500-NO <sub>3</sub> B / Spectrophotometer	Plastic	500	0.02	0.10	mg/l as NO <sub>3</sub> <sup>-</sup> -N	2	
16	Potassium (K)	Direct Aspiration-AAS Method	Standard Method part 3111 B / AAS	Plastic	500	0.008	0.025	mg/l as K	3	
17	Potassium (K)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as K	2	
18	Selenium (Se)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Se	2	
19	Silica (SiO <sub>2</sub> )	Molybdosilicate Method	Standard Method part 4500-SiO <sub>2</sub> C / Spectrophotometer	Plastic	500	1.00	2.00	mg/l as SiO <sub>2</sub>	2	
20	Silicon (Si)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Si	2	
21	Silver (Ag)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.0004	0.05	mg/l as Ag	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
22	Sodium (Na)	Direct Aspiration-AAS Method	Standard Method part 3111 B / AAS	Plastic	500	0.005	0.050	mg/l as Na	3	
23	Sodium (Na)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Na	2	
24	Sodium Absorption Ratio (SAR)	Calculation,Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	-	2	
25	Strontium (Sr)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Sr	2	
26	Tin (Sn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sn	2	
27	Titanium (Ti)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ti	2	
28	Thallium (Tl)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Tl	2	
29	Vanadium (V)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as V	2	
30	Phosphate (PO <sub>4</sub> <sup>3-</sup> )	Ascorbic Acid Method	Standard Method part 4500-PO <sub>4</sub> -B/E / Spectrophotometer	Plastic	500	0.03	0.46	mg/l as P	2	
31	Phosphorus (P)	Ascorbic Acid Method	Standard Method part 4500-P-B/E / Spectrophotometer	Plastic	500	0.05	0.15	mg/l as P	2	
32	Sulfate (SO <sub>4</sub> <sup>2-</sup> )	Turbidimetric Method	Standard Method part 4500-SO <sub>4</sub> <sup>2-</sup> / Spectrophotometer	Plastic	500	1.50	5.00	mg/l as SO <sub>4</sub> <sup>2-</sup>	2	
33	Surfactant (LAS)	Anionic Surfactants as MBAS	Standard Method Part 5540 C / Spectrophotometer	Plastic	500	0.35	0.40	mg/l as MBAS	2	
34	Surfactant (LAS)	Anionic Surfactants as MBAS	Standard Method Part 5540 C / Spectrophotometer	Plastic	1000	0.08	0.10	mg/l as MBAS	2	น้ำดื่ม
35	Fluoride (F <sup>-</sup> )	Ion-Selective Electrode Method	Standard Method part 4500-F-C / Spectrophotometer	Plastic	100	0.20	0.50	mg/l as F	2	
36	Gold (Au)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Au	2	
37	Phosphorus (P)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as P	2	
38	Chlorine (Residual)	Spectrophotometric Method	Standard Method part 4500-Cl G / Spectrophotometer	Plastic	500	0.03	0.05	mg/l as Cl <sub>2</sub>	2	
39	Beryllium	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Be	2	
40	Nitrate (NO <sub>3</sub> <sup>-</sup> )	Ion Chromatography Method	Standard Method part 4110B / Ion Chromatography	Plastic	500	0.10	0.50	mg/l as NO <sub>3</sub> <sup>-</sup>	2	
41	Nitrate-Nitrogen (NO <sub>3</sub> <sup>-</sup> -N)	Ion Chromatography Method	Standard Method part 4110B / Ion Chromatography	Plastic	500	0.02	0.11	mg/l as NO <sub>3</sub> <sup>-</sup> -N	2	
42	Phenol	Liquid-Liquid Extraction / GC-MS	Standard Method part 6410B	Glass	2500	0.0001	0.0010	mg/l	4	น้ำดื่ม
43	Phosphate - Phosphorus (PO <sub>4</sub> -P)	Ascorbic Acid Method	Standard Method part 4500-PO <sub>4</sub> -B/E / Spectrophotometer	Plastic	500	0.05	0.15	mg/l as P	2	น้ำดื่ม MDL:LOQ = 50 /150 ug/l
44	Ammonia Nitrogen (NH <sub>3</sub> -N)	Distillation and Phenatic Method	Standard Method part 4500-NH <sub>3</sub> -N, F / Spectrophotometer	Plastic	500	0.05	0.10	mg/l as NH <sub>3</sub> -N	2	น้ำดื่ม

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
45	Ammonia (NH <sub>3</sub> )	Distillation and Phenate Method	Standard Method part 4500-NH <sub>3</sub> -B, F. / Spectrophotometer	Plastic	500	0.06	0.12	mg/l as NH <sub>3</sub>	2	ไม่พบ

Rev.1/2566 23/1/2566

#### การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางนี้ ใช้สำหรับผลการขึ้นตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ **งานที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม**

(ประเภทตัวอย่าง : น้ำเสียขึ้นทะเบียนกรมโรงงานฯ, น้ำ, น้ำเสียอุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล)

ส่วนรวม : ส่วนงานทดสอบพื้นฐาน

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1.1	Biochemical Oxygen Demand (BOD <sub>5</sub> )	5-Day BOD Test, Membrane Electrode Method	Standard Method part 5210 B, 4500-O G / DO meter	Plastic	1000	-	2.0	mg/l	1	
1.2	Biochemical Oxygen Demand (BOD <sub>5</sub> )	5-Day BOD Test, Azide Modification Method	Standard Method part 5210 B, 4500-O C / Titration	Plastic	1000	-	2.0	mg/l	1	
2.1	Chemical Oxygen Demand (COD)	In-house Method	Standard Method part 5220 C / Titration	Plastic	100	-	40	mg/l as O <sub>2</sub>	0	
2.2	Chemical Oxygen Demand (COD)	Titrimetric, Closed Reflux Method	Standard Method part 5220 C / Titration	Plastic	100	-	40	mg/l as O <sub>2</sub>	0	
3	Free Chlorine	Iodometric Method	Standard Method part 4500-B / Titration	Plastic	100	-	0.50	mg/l	2	
4	Total Dissolved Solids (TDS)	Dried at 180 °C	Standard Method part 2540 C / Gravimetric	Plastic	200	-	25	mg/l	0	
5.1	Grease&Oil	In-house Method	Standard Method part 5520 B / Gravimetric	Glass	1000	-	3.0	mg/l	1	
5.2	Grease&Oil	Partition Gravimetric Method	Standard Method part 5520 B / Gravimetric	Glass	1001	-	3.0	mg/l	1	
6	Sulfide (S <sub>2</sub> <sup>-</sup> )	ZnS Precipitation, Iodometric Method	Standard Method part 4500-S <sup>2-</sup> F / Titration	BOD bottle	300	-	0.50	mg/l as H <sub>2</sub> S	2	
7	pH	Electrometric Method	Standard Method part 4500 H <sup>+</sup> / pH meter	Plastic	50	-	3.9-12.9	-	1	
8	Total Suspended Solids (TSS)	Dried at 103-105 °C	Standard Method part 2540 D / Gravimetric	Plastic	1000	-	5	mg/l	0	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
9	Temperature	Laboratory and Field Method	Standard Method part 2550 B / Thermometer	at field		-	1	$^{\circ}\text{C}$	0	
10	Total Kjeldahl Nitrogen (TKN)	Macro-Kjeldahl Method	Standard Method part 4500-N <sub>org</sub> / Titration	Plastic	500	-	5	mg/l as NH <sub>3</sub> -N	0	
11	Hydrogen Sulfide (H <sub>2</sub> S)	ZnS Precipitation ,Iodometric Method	Standard Method part 4500-S <sup>2-</sup> P / Titration	BOD bottle	300	-	0.53	mg/l as H <sub>2</sub> S	2	

**การตรวจวัดภาวะคุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)**

ตารางที่ 3 สรุปข้อกำหนดการตรวจวัดค่าและหน่วยการวัดในการทดสอบตัวอย่างของสิ่งปนเปื้อนต่างๆ ที่นำขึ้นเพื่อเปรียบเทียบกับกรมโรงงานอุตสาหกรรม (ประเภทตัวอย่าง: น้ำ, น้ำเสีย, น้ำที่อุปโภค, น้ำประปา, น้ำดื่ม, น้ำบาดาล และน้ำทะเล)

ส่วนรวม : ส่วนรวมทดสอบพื้นฐาน

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Acidity	Titration Method	Standard Method part 2310 B / Titration	Plastic	50	-	20.00	mg/l as CaCO <sub>3</sub>	1	
2	M-Alkalinity	Titration Method	Standard Method part 2320 B / Titration	Plastic	50	-	20.00	mg/l as CaCO <sub>3</sub>	1	
3	P-Alkalinity	Titration Method	Standard Method part 2320 B / Titration	Plastic	50	-	20.00	mg/l as CaCO <sub>3</sub>	1	
4	Ammonia Nitrogen (NH <sub>3</sub> -N)	Distillation and Titrimetric Method	Standard Method part 4500-NH <sub>3</sub> <sup>+</sup> / Titration	Plastic	500		2	mg/l as NH <sub>3</sub> -N	1	
5	Calcium Hardness	EDTA Titrimetric Method	Standard method part 3500-Ca B / Titration	Plastic	100	-	3.0	mg/l as CaCO <sub>3</sub>	1	
6	Chloride (Cl <sup>-</sup> )	Argentometric Method	Standard Method part 4500-Cl <sup>-</sup> B / Titration	Plastic	50	-	5.0	mg/l as Cl <sup>-</sup>	1	
7	Chlorine (Residual)	DPD Colorimetric Method	Standard Method part 4500-Cl G / Test kit	Plastic	500	-	0.1	mg/l as Cl <sub>2</sub>	1	
8	Chlorine (Total)	DPD Colorimetric Method	Modified Standard Method part 4500-Cl G / Test kit	Plastic	500	-	0.1	mg/l as Cl <sub>2</sub>	1	
9	Fixed Solids (FS)	Dried at 550 $^{\circ}\text{C}$	Standard Method part 2540 E / Gravimetric	Plastic	200	-	30.0	mg/l	1	
10	Hardness	EDTA Titrimetric Method	Standard Method part 2340 C / Titration	Plastic	100	-	6.0	mg/l as CaCO <sub>3</sub>	1	
11	Magnesium (Mg)	Calculation Method	Standard Method part 3500-Mg / Calculation	Plastic	100	-	0.70	mg/l as Mg	1	
12	Magnesium Hardness	Calculation Method	Standard Method part 3500-Mg / Calculation	Plastic	100	-	3.0	mg/l as CaCO <sub>3</sub>	1	
13	Mix Liquor Suspended Solids (MLSS)	Dried at 103-105 $^{\circ}\text{C}$	Standard Method part 2540 C / Gravimetric	Plastic	200	-	5	mg/l	1	
14	Mix Liquor Volatile Suspended Solids (MLVSS)	Dried at 550 $^{\circ}\text{C}$	Standard Method part 2540 E / Gravimetric	Plastic	200	-	5	mg/l	1	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
15	Organic Nitrogen	Macro-Kjeldahl Method	Standard Method part 4500-N <sub>org</sub> / Titration	Plastic	500	-	5	mg/l as NH <sub>3</sub> -N	1	Org-N = TKN-(Ammonia-N)
17	Conductivity	Laboratory Method	Standard Method part 2510 B	Plastic	200	-	0.1	us/cm	หัตถ์หน่วย 2 ส่วนหนึ่งหัตถ์	อ่านจากเครื่อง
18	Salinity	Electrical Conductivity Method	Standard Method part 2520 B / Conductivity meter	Plastic	100	-	0.01	ppt	หัตถ์หน่วย 2 ส่วนหนึ่งหัตถ์	อ่านจากเครื่อง
19	Sludge Volume Index (SV <sub>30</sub> )	Volumetric Method	Standard Method part 2540 F / Volumetric	Plastic	1000	-	0.1	ml/l	1	
20	Sulfate	Titrimetric Method	Standard Method part 4500-SO <sub>4</sub> <sup>2-</sup> B / Titration	Plastic	200	-	2.00	mg/l as SO <sub>4</sub> <sup>2-</sup>	2	
21	Total Dissolved Solids (TDS)	Dried at 103-105 °C	Modified Standard Method part 2540 B / Gravimetric	Plastic	200	-	25	mg/l	0	
22	Turbidity	Nephelometric Method	Standard Method part 2130 B / Turbidity meter	Plastic	50	0.01	0.01	NTU	หัตถ์หน่วย 2 ส่วนหนึ่งหัตถ์	NTU=FTU=ซิลิกาทด
23	Volatile Fatty Acid	Titrimetric Method	คู่มือวิเคราะห์น้ำเสีย ตามมาตรฐานวิธีกรมสิ่งแวดล้อมแห่งประเทศไทย / Titration	Plastic	200	-	1.00	mg/l	1	
24	Volatile Solids (VS)	Dried at 550 °C	Standard Method part 2540 E / Gravimetric	Plastic	200	-	3.0	mg/l	1	
25	Volatile Suspended Solids (VSS)	Dried at 550 °C	Standard Method part 2540 E / Gravimetric	Plastic	200	-	3.0	mg/l	1	
26	Dissolved Oxygen(DO)	Azide Modification	Standard Method part 4500-O C/Titration	Plastic	300	-	0.3	mg/l	1	
	ส่วนงานจุลชีววิทยา									
1	Benthos	Counting Chamber Method	Standard Method part 10500 B / Counting	ถุงดำ	-	-	-	ind/m <sup>2</sup>	0	รายงานต่ำสุด =Not found
2	Escherichia Coli Bacteria (E.coli)	MPN Test	Standard Method part 9221 F / Fluorogenic Substrate , MPN	Glass	250	-	-	MPN:100 ml	สามตัววาง MPN-	รายงานต่ำสุด 1.1 (มีเต็ม) / 1.8 (น้ำ)
3	Total Coliform	MPN Test	Standard Method part 9221 B / Fermentation Technique , MPN	Glass	250	-	-	MPN:100 ml	สามตัววาง MPN-	รายงานต่ำสุด 1.1 (มีเต็ม) / 1.8 (น้ำ)

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
4	Thermotolerant coliforms (Fecal Coliform)	MPN Test	Standard Method part 9221 E /Thermotolerant Coliform , MPN	Glass	250	-	-	MPN:100 ml	สามตัววาง MPN-	รายงานต่ำสุด 1.1 (มีเต็ม) / 1.8 (น้ำ)
5	Heterotrophic Bacteria (Total Bacteria)	Heterotrophic plate count (Standard Plate Count Method)	Standard Method part 9215 B / Pour plate	Glass	250	1	1	Colonies/cm <sup>3</sup>	0	*Heterotrophic plate count = Standard plate Count
6	Phytoplankton	Counting Chamber Method	Standard Method part 10200 F / Counting	Plastic	-	-	-	Cell / l	0	รายงานต่ำสุด =Not found
7	Zooplankton	Counting Chamber Method	Standard Method part 10200 G / Counting	Plastic	-	-	-	ind./l	0	รายงานต่ำสุด =Not found
8	S.Aureus	Enrichment	Standard Method part 9213 B	Glass	1000	-	-	-	รายงาน พบ/ ไม่พบ	รายงานต่ำสุด =Not found
9	Salmonella sp.	Membrane Filter	Standard Method part 9260 B	Glass	1000	-	-	-	รายงาน พบ/ ไม่พบ	รายงานต่ำสุด =Not found
10	Clostridium perfringens	Compendium 2003,Chapter 34	Compendium 2003,Chapter 34	Glass	1000	-	-	-	รายงาน พบ/ ไม่พบ	รายงานต่ำสุด =Not found



การตรวจวิเคราะห์คุณภาพน้ำ - การทดสอบ (Water - Solid wastes Quality Analysis)

ตามนี้ จะใช้ได้กับผลการวิเคราะห์ที่วัดความเข้มข้นในรูปของสารเคมีที่ระบุในรายการ **แต่ไม่ได้หมายความว่าสามารถวิเคราะห์**

(ประกอบด้วย 3 ไม้บรรทัด )

ส่วนที่ ๓. ส่วนประกอบของข้อมูล

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sb	2	
2	Arsenic (As)	Continuous Hydride Generation-ICP-OES Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.0010	0.0020	mg/l as As	4	
3	Arsenic (As)	Continuous Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method Part 3114 B and 3114 C / AAS	Plastic	500	0.0005	0.0020	mg/l as As	4	
4	Barium (Ba)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Ba	2	
5	Beryllium (Be)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.005	0.01	mg/l as Be	2	
6	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.0001	0.003	mg/l as Cd	3	
7	Chromium (Cr)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.03	mg/l as Cr	2	
8	Cyanide (CN)	Distillation, Colorimetric Method	Standard Method part 4500 CN <sup>-</sup> C/E/ Spectrophotometer	Plastic	500	0.008	0.020	mg/l	3	
9	Chromium Hexavalence (Cr <sup>6+</sup> )	Filtration,Colorimetric Method	Standard Method part 3500-Cr B/ Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr <sup>6+</sup>	3	
10	Lead (Pb)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.0017	0.010	mg/l as Pb	3	
11	Manganese (Mn)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.0005	0.03	mg/l as Mn	2	
12	Mercury (Hg)	Digestion, Cold Vapor Atomic Absorption Spectrometric Method	Standard Method part 3112 B / AAS	Plastic	500	0.0005	0.0010	mg/l as Hg	4	
13	Nickel (Ni)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.02	mg/l as Ni	2	แก้ไข DL ตามมาตรฐานฉบับใหม่
14	Phenols	Distillation, Direct Photometric Method	Standard Method part 5530 D / Spectrophotometer	Plastic	500	0.002	0.005	mg/l	3	
15	Silver (Ag)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.0004	0.05	mg/l as Ag	2	
16	Trivalent Chromium (Cr <sup>3+</sup> )	Digestion,Direct Aspiration-AAS Method; Filtration,Colorimetric Method,Calculation	Standard Method part 3500-Cr B & part 3111B /AAS	Plastic	500	0.05	0.30	mg/l	2	
17	Trivalent Chromium (Cr <sup>3+</sup> )	Digestion,ICP-OES Method; Filtration,Colorimetric Method,Calculation	Standard Method part 3500-Cr B & part 3120B / ICP-OES	Plastic	500	0.002	0.03	mg/l	2	
18	Vanadium (V)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as V	2	
19	Zinc (Zn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.005	0.03	mg/l as Zn	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
20	Selenium (Se)	Digestion, Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method part 3030F, 3114 B and 3114C	Plastic	500	0.0005	0.0020	mg/l	4	แก้ไขตามมาตรฐาน 1 ม.ร.ม. 2565
21	Volatile organic compounds(VOCs)	Purge-and-Trap GC-MS	Standard Method part 6200B	Glass	40 *4					
1	- Benzene					0.00025	0.00050	mg/l	5	
2	- Bromodichloromethane					0.00050	0.00050	mg/l	5	
3	- Bromoform					0.00050	0.00050	mg/l	5	
4	- Carbon tetrachloride					0.00025	0.00025	mg/l	5	
5	- Chlorobenzene					0.00025	0.00050	mg/l	5	
6	- Chlorodibromomethane					0.00050	0.00100	mg/l	5	
7	- 1,2-Dichlorobenzene					0.00025	0.00050	mg/l	5	
8	- 1,3-Dichlorobenzene					0.00025	0.00025	mg/l	5	
9	- 1,4-Dichlorobenzene					0.00025	0.00025	mg/l	5	
10	- 1,1-Dichloroethane					0.00025	0.00025	mg/l	5	
11	- 1,2-Dichloroethane					0.00025	0.00050	mg/l	5	
12	- 1,1-Dichloroethylene					0.00025	0.00050	mg/l	5	
13	- cis-1,2-Dichloroethylene					0.00050	0.00050	mg/l	5	
14	- trans-1,2-Dichloroethylene					0.00025	0.00050	mg/l	5	
15	- 1,2-Dichloropropane					0.00025	0.00050	mg/l	5	
16	- 1,3-Dichloropropane					0.00025	0.00050	mg/l	5	
17	- Ethylbenzene					0.00025	0.00050	mg/l	5	
18	- Methyl tert-butyl ether					0.00025	0.00050	mg/l	5	
19	- Naphthalene					0.00025	0.00100	mg/l	5	
20	- Nitrobenzene					0.00025	0.00025	mg/l	5	
21	- Styrene					0.00050	0.00100	mg/l	5	
22	- 1,1,2,2-Tetrachloroethane					0.00050	0.00050	mg/l	5	
23	- Tetrachloroethylene					0.00025	0.00050	mg/l	5	
24	- Toluene					0.00025	0.00050	mg/l	5	
25	- 1,2,4-Trichlorobenzene					0.00025	0.00050	mg/l	5	
26	- 1,1,1-Trichloroethane					0.00025	0.00025	mg/l	5	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
27	- 1,1,2-Trichloroethane					0.00025	0.00050	mg/l	5	
28	- Trichloroethylene					0.00025	0.00050	mg/l	5	
29	- 1,3,5-Trimethylbenzene					0.00025	0.00100	mg/l	5	
30	- Vinyl acetate					0.00050	0.00100	mg/l	5	
31	- Vinyl Chloride					0.00025	0.00025	mg/l	5	
32	- m-Xylene					0.00025	0.00100	mg/l	5	
33	- o-Xylene					0.00025	0.00100	mg/l	5	
34	- p-Xylene					0.00025	0.00100	mg/l	5	
35	- Xylene Total					0.00025	0.00100	mg/l	5	
22	Volatile organic compounds/VOC/G	Purge-and-Trap / GC-MS Method	Standard Method part 6200B	Glass	40 *4					
1	- Acetone					0.00100	0.00100	mg/l	5	
2	- Butanol					0.00100	0.00100	mg/l	5	
3	- Carbon disulfide					0.00200	0.00500	mg/l	5	
4	- Chloroform					0.00100	0.00200	mg/l	5	
5	- n-Hexane					0.00100	0.00200	mg/l	5	
6	- Dichloromethane					0.00200	0.00200	mg/l	5	
23	Semivolatile organic compounds #1	Liquid-Liquid Extraction / GC-MS	Standard Method part 6410B	Glass	2500					
1	Acenaphthene					0.0005	0.0010	mg/l	4	
2	Anthracene					0.0005	0.0010	mg/l	4	
3	Ben(a)anthracene					0.0005	0.0010	mg/l	4	
4	Ben(a)fluoranthene					0.0005	0.0010	mg/l	4	
5	Ben(b)fluoranthene					0.0005	0.0010	mg/l	4	
6	Ben(a)pyrene					0.00005	0.0001	mg/l	4	เกิน DL ตามมาตรฐานวิธีตรวจ
7	Ben(a)ghi(peri)ene					0.0005	0.0010	mg/l	4	
8	But(2-chloroethyl) ether					0.0005	0.0100	mg/l	4	
9	But(2-ethylhexyl) phthalate					0.0005	0.0010	mg/l	4	
10	Butyl benzyl phthalate					0.0005	0.0010	mg/l	4	
11	Carbazole					0.0005	0.0010	mg/l	4	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
12	m-Chloronitrobenzene					0.0005	0.0100	mg/l	4	
13	2-Chlorophenol					0.0005	0.0010	mg/l	4	
14	Chrysene					0.0005	0.0010	mg/l	4	
15	Dibenz(a,h)anthracene					0.0005	0.0010	mg/l	4	
16	Di-n-butyl phthalate					0.0005	0.0100	mg/l	4	
17	2,4-Dichlorophenol					0.0005	0.0010	mg/l	4	
18	Diethyl Phthalate					0.0005	0.0010	mg/l	4	
19	2,4-Dimethylphenol					0.0005	0.0010	mg/l	4	
20	2,4-Dinitrotoluene					0.0005	0.0010	mg/l	4	
21	2,6-Dinitrotoluene					0.0005	0.0010	mg/l	4	
22	Di-n-octyl phthalate					0.0005	0.0010	mg/l	4	
23	Fluoranthene					0.0005	0.0010	mg/l	4	
24	Fluorene					0.0005	0.0010	mg/l	4	
25	Hexachlorobenzene					0.0005	0.0010	mg/l	4	
26	Hexachloro-1,3-butadiene					0.0005	0.0010	mg/l	4	
27	Hexachlorocyclopentadiene					0.0005	0.0100	mg/l	4	
28	Hexachloroethane					0.0005	0.0010	mg/l	4	
29	Indene(1,2,3-c)pyrene					0.0005	0.0010	mg/l	4	
30	Isothiazine					0.0005	0.0010	mg/l	4	
31	2-Methylphenol (o-Cresol)					0.0005	0.0010	mg/l	4	
32	2-Methylphthalate					0.0005	0.0010	mg/l	4	
33	N-Nitrosodipropylamine					0.0005	0.0010	mg/l	4	
34	Phenanthrene					0.0005	0.0010	mg/l	4	
35	Phenol					0.0005	0.0010	mg/l	4	
36	Pyrene					0.0005	0.0010	mg/l	4	
37	2,4,5-Trichlorophenol					0.0005	0.0010	mg/l	4	
38	2,4,6-Trichlorophenol					0.0005	0.0010	mg/l	4	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
24	Semi-volatile organic compounds #2	Liquid-Liquid Extraction / GC/MS	Standard Method part 6410B	Glass	2500	0.030	0.050	µg/l	3	
1	Aldrin					0.030	0.050	µg/l	3	
2	Chlordane					0.030	0.050	µg/l	3	
3	DDE					0.030	0.050	µg/l	3	
4	DDE					0.030	0.050	µg/l	3	
5	DDT					0.030	0.050	µg/l	3	
6	Dieldrin					0.030	0.050	µg/l	3	
7	Endosulfan					0.030	0.050	µg/l	3	
8	Endrin					0.050	0.100	µg/l	3	
9	Heptachlor					0.030	0.050	µg/l	3	
10	Heptachlor epoxide					0.030	0.050	µg/l	3	
11	alpha - BHC					0.020	0.050	µg/l	3	
12	beta - BHC					0.030	0.050	µg/l	3	
13	gamma - BHC					0.030	0.050	µg/l	3	
14	Methoxychlor					0.030	0.050	µg/l	3	
26	Aluminum (Al)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.022	0.10	mg/l as Al	2	
27	Copper (Cu)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.001	0.03	mg/l as Cu	2	
28	Iron (Fe)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.05	mg/l as Fe	2	
29	Molybdenum (Mo)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.02	mg/l as Mo	2	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

หมายเหตุ: สรุปใช้กำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : ดิน )

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
1	Arsenic (As)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.00	mg/kg as As	2	
2	Antimony (Sb)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.00	mg/kg as Sb	2	
3	Barium (Ba)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Ba	2	
4	Beryllium (Be)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Be	2	
5	Cadmium (Cd)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.10	0.15	mg/kg as Cd	2	
6	Chromium (Cr)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Cr	2	
7	Hexavalent Chromium (Cr6+)	Digestion,Colorimetric Method	US EPA SW 846 Method 3060A and 7196A / Spectrophotometer	Plastic	500	0.12	0.25	mg/kg as Cr6+	2	แก้ไข DL ตามมาตรฐานฉบับใหม่
8	Lead (Pb)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Pb	2	
9	Manganese (Mn)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Mn	2	
10	Mercury (Hg)	Digestion,Cold Vapor Technique-AAS Method	US EPA SW 846 Method 3050B and 7471B / AAS	Plastic	500	0.10	0.20	mg/kg as Hg	4	
11	Nickel (Ni)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Ni	2	
12	Selenium (Se)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.00	mg/kg as Se	2	
13	Silver (Ag)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	1.00	2.50	mg/kg as Ag	2	
14	Trivalent Chromium (Cr3+)	Digestion,ICP-OES Method; Filtration,Colorimetric Method,Calculation	US EPA SW 846 Method 3050B and 6010C / ICP-OES; Method 3060A and 7196A / Spectrophotometer	Plastic	500	0.12	0.25	mg/kg as Cr	2	
15	Vanadium (V)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as V	2	
16	Zinc (Zn)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Zn	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
17	Iron (Fe)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	10.4	50.0	mg/kg as Fe	1	ขึ้นทะเบียนเพิ่มอีก 9 ส.ก 2568
18	Aluminum (Al)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	9.3	50.0	mg/kg as Al	1	ขึ้นทะเบียนเพิ่มอีก 9 ส.ก 2568
19	Copper (Cu)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.55	1.00	mg/kg as Cu	2	ขึ้นทะเบียนเพิ่มอีก 9 ส.ก 2568
20	Molybdenum (Mo)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.13	1.00	mg/kg as Mo	2	ขึ้นทะเบียนเพิ่มอีก 9 ส.ก 2568
21	Volatile organic compounds,VOC			Glass	50					
1	- Acetone	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
2	- Benzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
3	- Bromodichloromethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
4	- Bromoform	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
5	- Butanol	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
6	- Carbon disulfide	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
7	- Carbon tetrachloride	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
8	- Chlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
9	- Chlorodibromomethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
10	- Chloroform	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
11	- 1,2-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
12	- 1,3-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
13	- 1,4-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
14	- 1,1-Dichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
15	- 1,2-Dichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
16	- 1,1-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
17	- cis-1,2-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
18	- trans-1,2-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
19	- 1,2-Dichloropropane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
20	- 1,3-Dichloropropane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
21	- Ethylbenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
22	- n-Hexane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.010	0.010	mg/kg	3	
23	- Methylene Chloride or Dichloromethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
24	- Methyl tert-butyl ether	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
25	- Naphthalene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
26	- Nitrobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
27	- Styrene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
28	- 1,1,2,2-Tetrachloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
29	- Tetrachloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
30	- Toluene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
31	- 1,2,4-Trichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
32	- 1,1,1-Trichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
33	- 1,1,2-Trichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
34	- Trichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
35	- 1,3,5-Trimethylbenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
36	- Vinyl acetate	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
37	- Vinyl Chloride	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
38	- m-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
39	- o-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
40	- p-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
41	- Xylene Total	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
22	Semivolatile organic compounds #1			Glass	2500					
1	Acenaphthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
2	Anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
3	Benzo[a]anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
4	Benzo[b]fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
5	Benzo[k]fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
6	Benzo[a]pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
7	Benzo[ghi]perylene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
8	Bis(2-chloroethyl) ether	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
9	Bis(2-ethylhexyl) phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
10	Butyl benzyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
11	Carbazole	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
12	p-Chloroaniline	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.500	1.250	mg/kg	3	
13	2-Chlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
14	Chrysene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
15	Dibenz[a,h]anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
16	Di-n-butyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
17	2,4-Dichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
18	Diethyl Phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
19	2,4-Dimethylphenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
20	2,4-Dinitrotoluene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
21	2,6-Dinitrotoluene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
22	Di-n-octyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
23	Fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
24	Fluorene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
25	Hexachlorobenzene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
26	Hexachloro-1,3-butadiene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
27	Hexachlorocyclopentadiene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
28	Hexachloroethane	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
29	Indeno[1,2,3-cd]pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	



Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
30	Iophorone	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
31	2-Methylphenol (o-Cresol)	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
32	2-Methylnaphthalene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
33	N-Nitrosodi-n-propylamine	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
34	Phenanthrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
35	Phenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
36	Pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
37	2,4,5-Trichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
38	2,4,6-Trichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
23	Semivolatile organic compounds #2									
1	- alpha - BHC	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
2	- beta - BHC	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
3	- gamma - BHC	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
4	- Heptachlor	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
5	- Aldrin	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
6	- Heptachlor epoxide	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
7	- Chlordane	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
8	- Dieldrin	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
9	- Endrin	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0012	0.0025	mg/kg	4	
10	- DDD	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
11	- DDT	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	
12	- Methoxychlor	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.0008	0.0012	mg/kg	4	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)  
ตารางที่ ๒ สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ **แผนที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม**  
(ประเภทตัวอย่าง : **ภาคตะกอน** ตามประกาศเรื่องสิ่งปฏิกูลที่ไม่ใช่สัตว์ และ ดิน )

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.05 2.50	0.10 5.00	mg/l as Sb mg/kg as Sb	2	
2	Arsenic (As)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.05 2.50	0.10 5.00	mg/l as As mg/kg as As	2	
3	Barium (Ba)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Ba mg/kg as Ba	2	
4	Beryllium (Be)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Be mg/kg as Be	2	
5	Cadmium (Cd)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.10	0.02 0.15	mg/l as Cd mg/kg as Cd	2	
6	Chromium (Cr)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Cr mg/kg as Cr	2	
7	Cobalt (Co)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Co mg/kg as Co	2	
8	Copper (Cu)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Cu mg/kg as Cu	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
9	Hexavalent Chromium ( $\text{Cr}^{6+}$ )	Colorimetric Method/ Spectrophotometer	SW 846 Method 7196A / Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr	3	
		Alkaline Digestion,Colorimetric Method/ Spectrophotometer	US EPA SW 846 Method 3060A and 7196A / Spectrophotometer			0.40	2.00	mg/kg as Cr	2	
10	Lead (Pb)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Pb	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Pb		
11	Mercury (Hg)	Waste Extraction, Cold Vapor Technique-AAS Method	US EPA SW 846 Method 1310A and Standard Method part 3112 B/ AAS	Plastic	500	0.0005	0.0010	mg/l as Hg	4	
		Digestion,Cold Vapor Technique-AAS Method	US EPA SW 846 Method 3050B and 7471B / AAS			0.10	0.20	mg/kg as Hg	2	
12	Molybdenum (Mo)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Mo	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Mo		
13	Nickel (Ni)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ni	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Ni		
14	Selenium (Se)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Se	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.00	mg/kg as Se		
15	Silver (Ag)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.02	0.05	mg/l as Ag	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			1.00	2.50	mg/kg as Ag		
16	Thallium (Tl)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as V	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.00	mg/kg as V		
17	Vanadium (V)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as V	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as V		
18	Zinc (Zn)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Zn	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Zn		

### การตรวจวิเคราะห์คุณภาพน้ำ – ภาคของแข็ง (Water – Solid wastes Quality Analysis)

ตารางนี้ 9 ระบุถึงเกณฑ์การเทียบเคียงค่าของและความสามารถในการทดสอบด้วยวิธีของห้องปฏิบัติการ ที่ไม่ได้ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทผลิตภัณฑ์ : ภาคของแข็ง ตามประกาศของสำนักงานปศุสัตว์แห่งชาติ)

ส่วนประกอบ : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Aluminum (Al)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Al	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.00	mg/kg as Al	2	
2	Boron (B)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as B	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as B	2	
3	Calcium (Ca)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Ca	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Ca	1	
4	Iron (Fe)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.02	0.05	mg/l as Fe	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			1.00	1.50	mg/kg as Fe	2	
5	Magnesium (Mg)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Mg	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Mg	1	
6	Manganese (Mn)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Mn	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Mn	2	
7	Potassium (K)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as K	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.00	50.0	mg/kg as K	2	
8	Silicon (Si)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.02	0.05	mg/l as Si	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			1.00	2.50	mg/kg as Si	2	
9	Sodium (Na)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as Na	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Na	1	
10	Strontium (Sr)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Sr	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Sr	2	
11	Tin (Sn)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sn	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.00	mg/kg as Sn	2	
12	Titanium (Ti)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ti	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Ti	2	
13	Phosphorus (P)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as P	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.00	50.0	mg/kg as P	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
14	Trivalent Chromium (Cr <sup>3+</sup> )	Waste Extraction , ICP-OES Method, Filtration, Colorimetric Method,Calculation  Digestion,ICP-OES Method, Filtration,Colorimetric Method,Calculation	US EPA SW 846 Method 1310A and 6010C / ICP-OES ; Method 3060A and 7196A / Spectrophotometer  US EPA SW 846 Method 3050B and 6010C / ICP-OES ; Method 3060A and 7196A / Spectrophotometer	Plastic	500	0.003	0.050	mg/l	2	
						0.40	2.00	mg/kg	2	

เอกสารอ้างอิง

1 Standard Methods for the Examination of Water and Wastewater 23rd Edition, APHA, AWWA, WEF, 2017

2 United States Environmental Protection Agency, Acid Digestion of Sediments Sludge and Solis. SW-846 Method 3050C,3060A,3510C,3620C,6010C,7000B,7196A,7471B

3 Methods of Seawater Analysis, 1976

4 ประมวลวิธีตรวจวิเคราะห์กรม ม.ศ. 2548 เรื่อง การกำหนดการปฏิบัติของวิธีทดสอบที่ไม่ขึ้นตัว, ราชกิจจานุเบกษา 125 มกราคม 2549 เล่มที่ 123 ตอนพิเศษ 114

5 คู่มือตรวจวิเคราะห์ตามป้ามือ ตามทบทวนการขึ้นค่าของกรมสิ่งแวดล้อมประเทศไทย พิมพ์ครั้งที่ 3, 2540

6 เกณฑ์ยอมรับ ตามวิธีการตามสหภาพยุโรป พิมพ์ครั้งที่ 3, 2544

7 เกณฑ์ยอมรับ ตามวิธีการตามสหภาพยุโรป พิมพ์ครั้งที่ 2, 2545