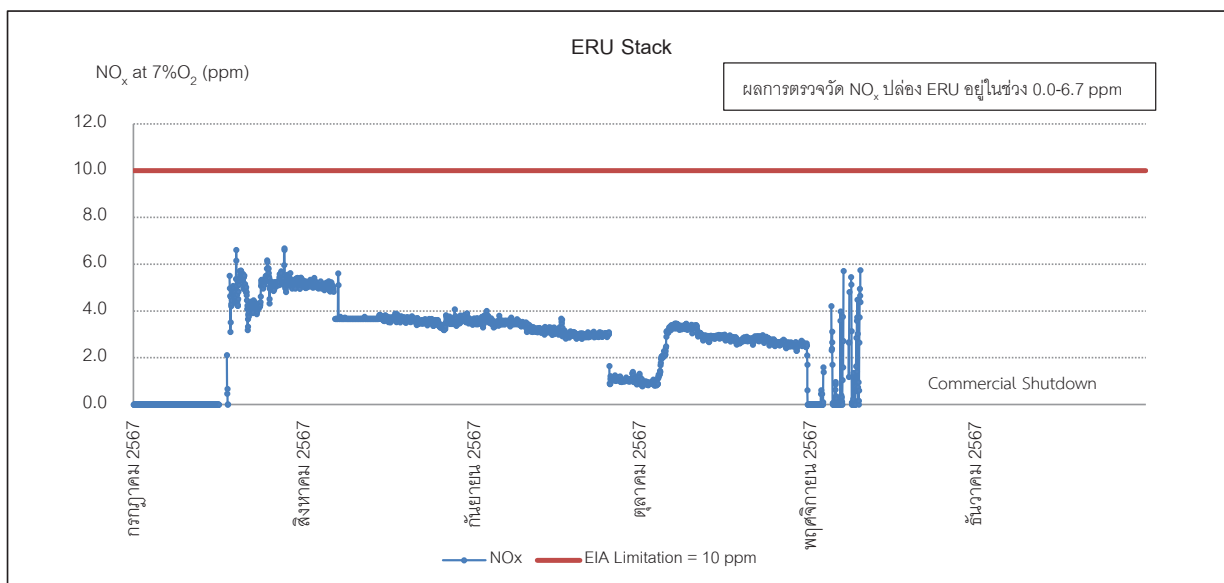
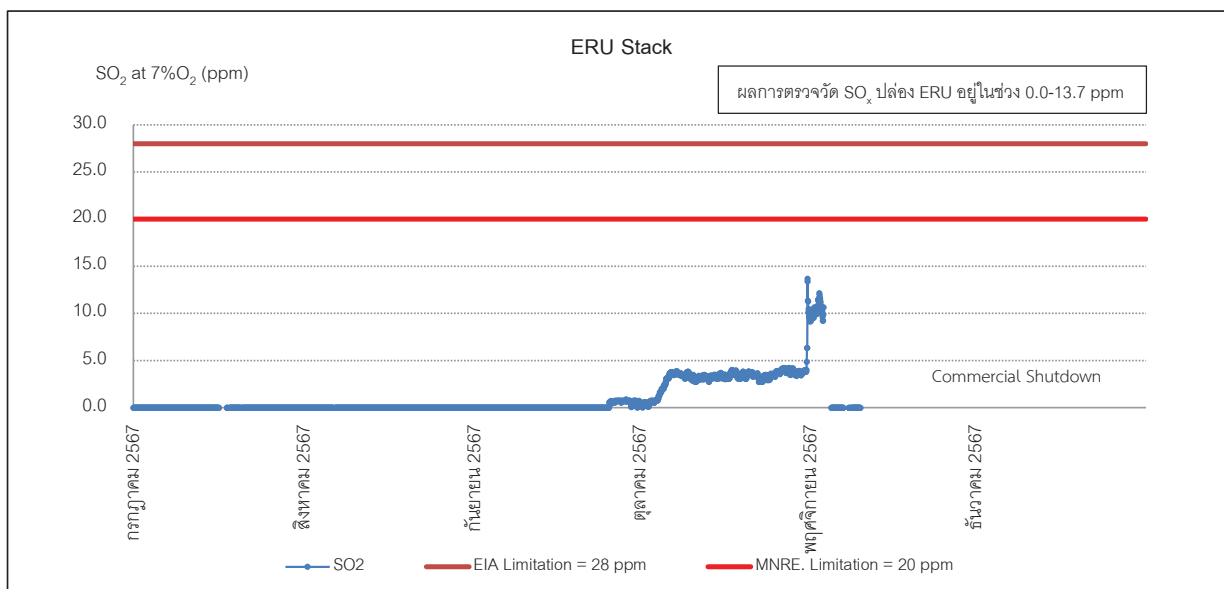


ภาคผนวกที่ 9

ข้อมูลด้าน CEMS ของโครงการ

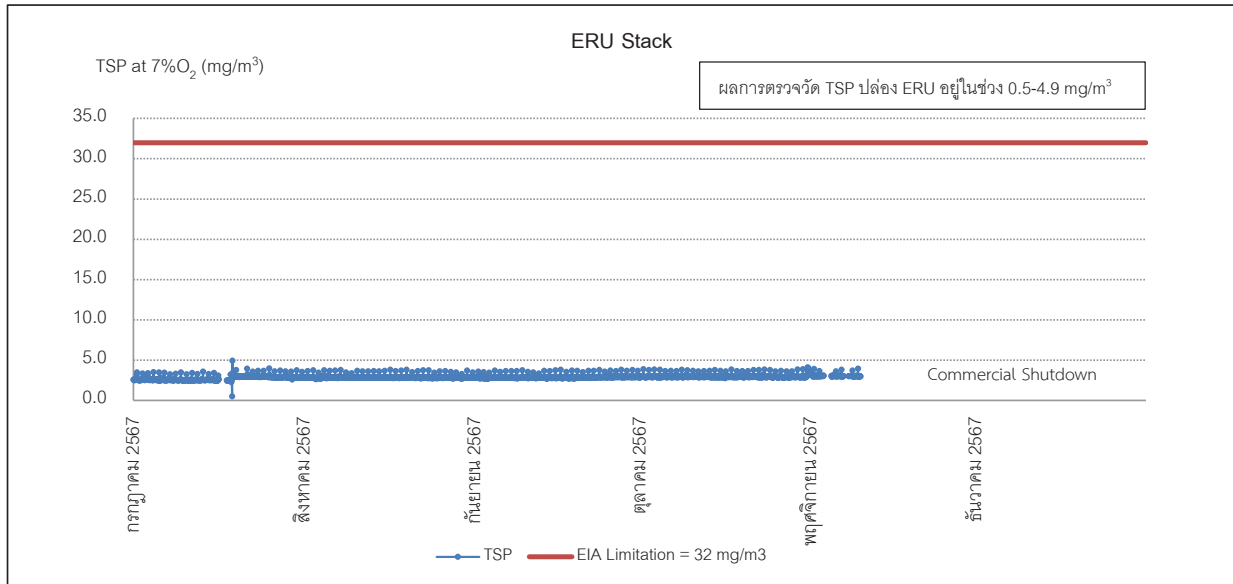
- ผล CEMs ระหว่างเดือนกรกฎาคม-ธันวาคม 2567
 - แผนการตรวจสอบความถูกต้องของระบบ CEMs ประจำปี พ.ศ. 2567
 - ผลการตรวจสอบระบบ CEMs (RATA) ประจำปี พ.ศ. 2567
 - ตัวอย่างการสอบเทียบระบบ CEMs โดยโครงการ (Internal Check)
 - ผลการตรวจสอบค่าความดันลดของระบบบำบัดปล่อย SAR
- ระหว่างเดือนกรกฎาคม-ธันวาคม 2567
- แผนการตรวจสอบและการดำเนินการ Demister FD-420

ผลการตรวจวัดคุณภาพอากาศจากปล่องด้วยระบบ CEMS
บริษัท พีทีที อาซาฮี เคมิคอล จำกัด ระหว่างเดือนกรกฎาคม-ธันวาคม 2567

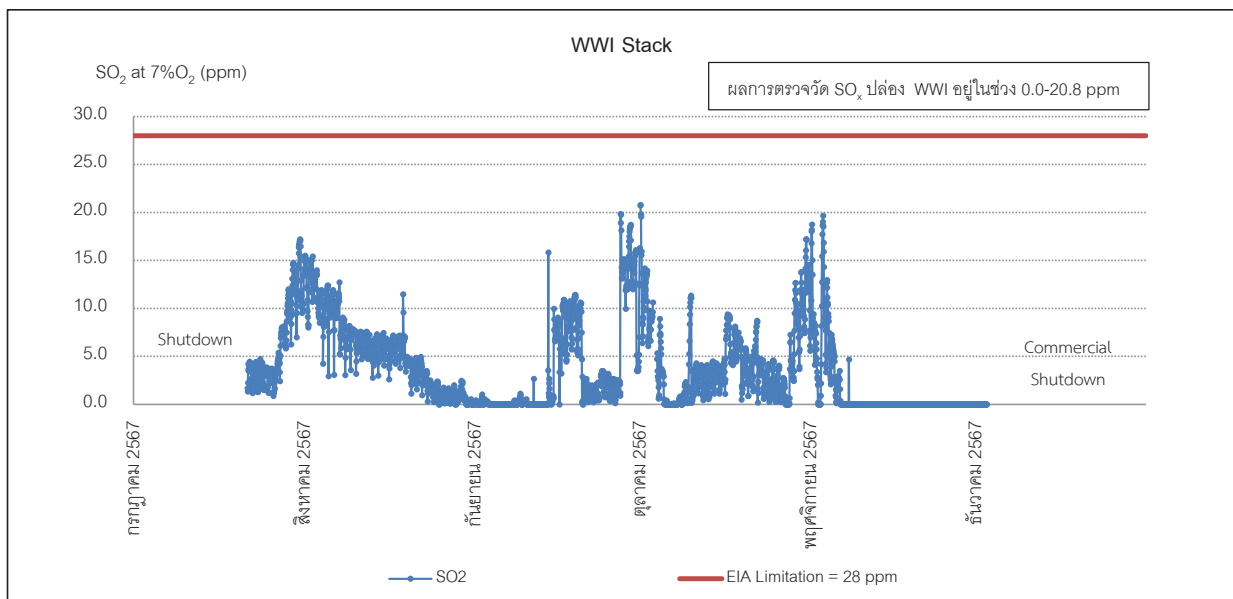


หมายเหตุ: ข้อมูลที่ขาดหายไปมีสาเหตุมาจากการซ่อมบำรุง การหยุดเดินกระบวนการผลิต และการสอบเทียบระบบ CEMS

ผลการตรวจวัดคุณภาพอากาศจากปล่องด้วยระบบ CEMS
บริษัท พีทีที อาซาฮี เคมิคอล จำกัด ระหว่างเดือนกรกฎาคม-ธันวาคม 2567 (ต่อ)

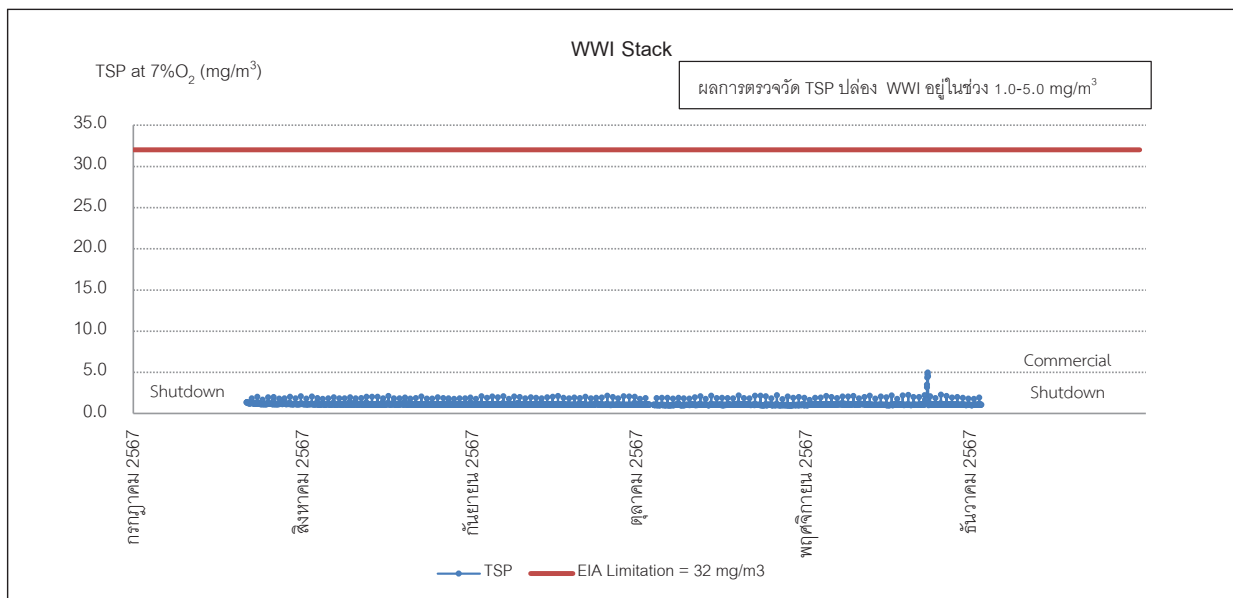
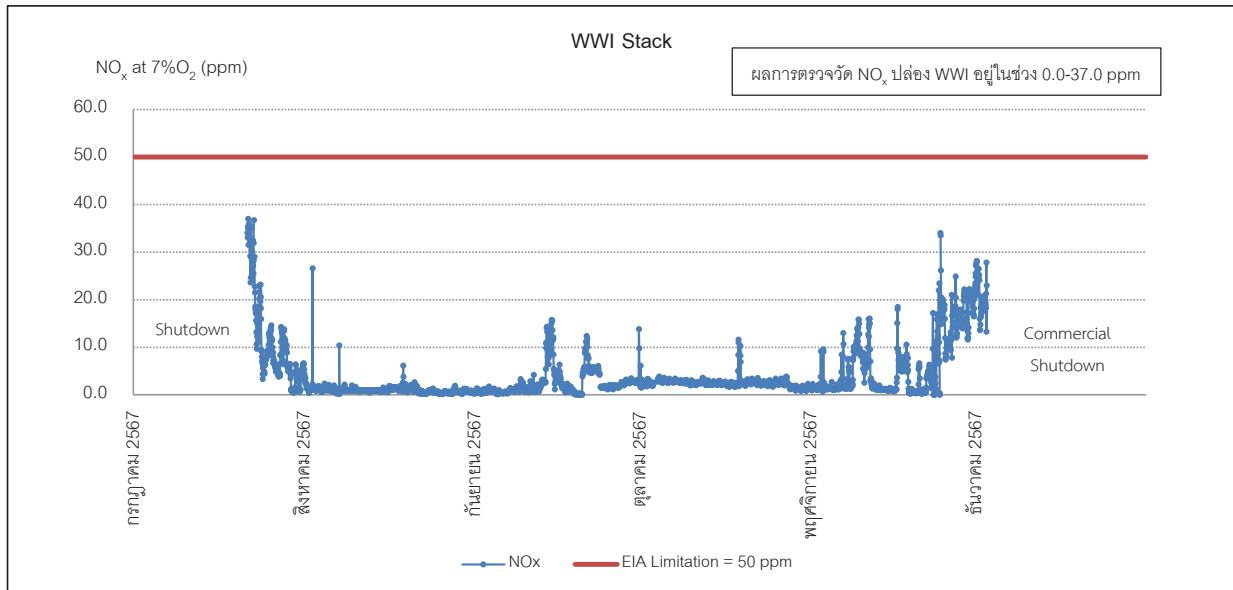


หมายเหตุ: ข้อมูลที่ขาดหายไปมีสาเหตุมาจากการซ่อมบำรุง การหยุดเดินกระบวนการผลิต และการสอบเทียบระบบ CEMS



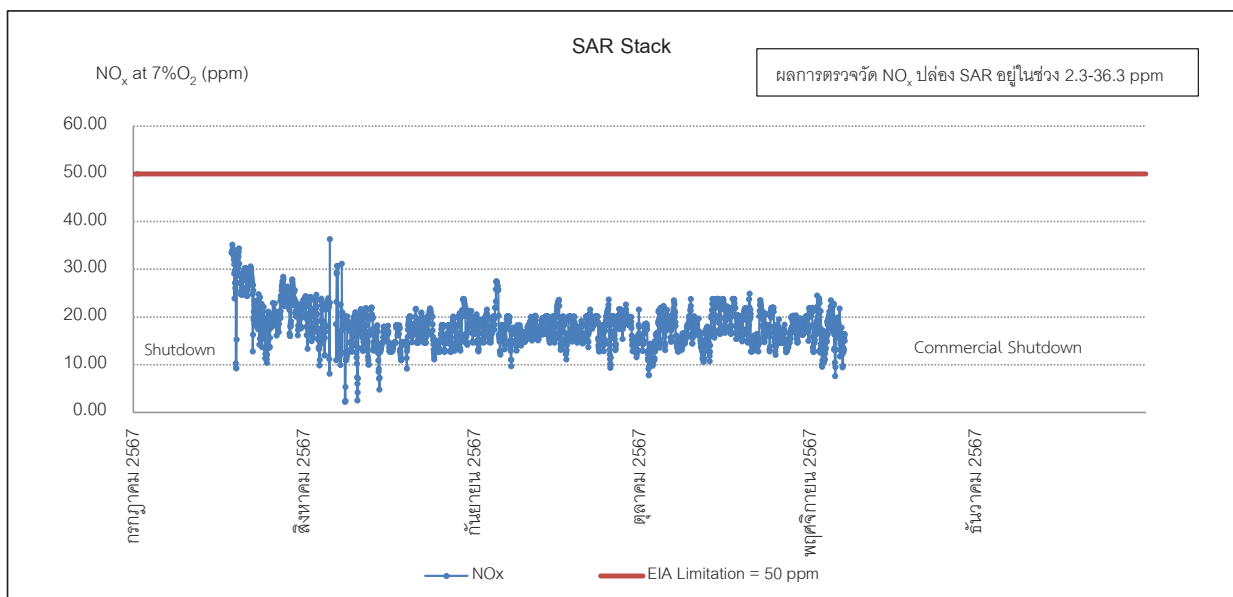
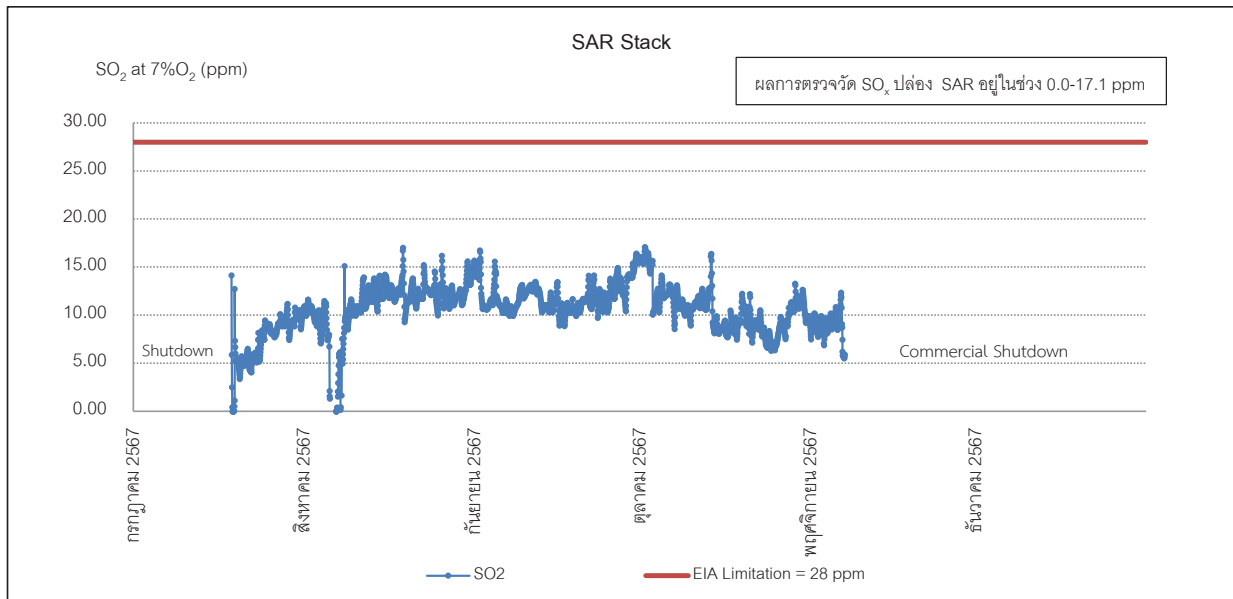
หมายเหตุ: ข้อมูลที่ขาดหายไปมีสาเหตุมาจากการซ่อมบำรุง การหยุดเดินกระบวนการผลิต และการสอบเทียบระบบ CEMS

ผลการตรวจวัดคุณภาพอากาศจากปล่องด้วยระบบ CEMS
บริษัท พีทีที อาซาฮี เคมีคอล จำกัด ระหว่างเดือนกรกฎาคม-ธันวาคม 2567 (ต่อ)



หมายเหตุ: ข้อมูลที่ขาดหายไปมีสาเหตุมาจากการซ่อมบำรุง การหยุดเดินกระบวนการผลิต และการสอบเทียบระบบ CEMS

ผลการตรวจวัดคุณภาพอากาศจากปล่องด้วยระบบ CEMS
บริษัท พีทีที อาซาฮี เคมิคอล จำกัด ระหว่างเดือนกรกฎาคม-ธันวาคม 2567 (ต่อ)



หมายเหตุ: ข้อมูลที่ขาดหายไปมีสาเหตุมาจากการซ่อมบำรุง และการหยุดเดินกระบวนการผลิต

- Performance criteria PM CEMS correlation must meet each of the minimum specifications in **Table 6.2-2**

Table 6.2-2 Summary of the Criteria for Correlation Testing (In case of the 3-level of PM is not passed)

Criteria		Specifications
Number of Paired-Train Reference Method Runs Best-fit Correlation Equation		Conduct a minimum of 15 runs passing relative standard deviation criteria
		Linear, Logarithmic, Polynomial, Exponential or Power
		Linear $y = b_0 + b_1x$
		Logarithmic $y = b_0 + b_1 \ln(x)$
		Polynomial $y = Ax^2 + Bx + C$
Correlation Coefficient (r)		Exponential $y = be^{ax}$
		Power $y = bx^{a1}$
		$\geq 0.85^{71} \geq 0.75^{72}$
Confident Interval (95%) at the Emission Limit		Shall be within 10% of the Emission Limit value
Tolerance Interval (95%) at the Emission Limit		75% of all possible values are within 25% of the emission limit

- Remarks :-**
- PS 11, Performance Specification 11-Specifications and Test Procedures for Particulate Matter Continuous Emission Monitoring Systems in Stationary Sources.
 - 71 If your source is not a low emitting source, the correlation coefficient (r) must be greater than or equal to 0.85
 - 72 If your source is a low emitting source, the correlation coefficient (r) must be greater than or equal to 0.75
 - If PM CEMS develop more than one correlation curve that satisfy the performance criteria specified in **Table 6.2-2**, should use the correlation curve with the greatest correlation coefficient

2) Reference Method (RM)

The measurement method and instrument that used to conduct the Reference Method (RM) for performing the Particulate Matter (PM) or Total Suspended Particulate (TSP) is referred to 40 CFR 60 Appendix A, Promulgated Method 5.

7. Results of Test

7.1 Relative Accuracy Test (RA)

The summary of RA results at WWI Stack, AOG Stack and SAR Stack, PTT Asahi Chemical Company Limited, Rayong province on September 25-27, 2024 is shown in **Table 7.1-1**. It was found that RA results at WWI Stack, AOG Stack and SAR Stack for NO_x, SO₂, CO, and O₂ meet the RA accepted criteria of U.S. EPA regulated in 40 CFR 60 Appendix B, Performance Specification 2, 3 and 4 (PS-2, PS-3 and PS-4). The details of summary are presented in **Table 7.1-1 – 7.1-3** (see more information in **Appendix A**).

Table 7.1-1 Summary of RA Test Results at WWI Stack, PTT Asahi Chemical Co., Ltd., Rayong province on September 27, 2024

Stack name	Sampling Date	Parameter	Unit	CEMs	RM (SGS)	Diff.	CC	%RA	Compared with RM ^{1/}			Compared with Emission Standard ^{2/}		
									criteria	Value	Pass /Not Pass	criteria	Value	Pass /Not Pass
WWI Stack	Sep 27, 2024	NO _x ^{2/} at 7%O ₂ (Compared with emission Standard 50 ppm)	ppm	2.16	5.48	3.32	0.52	7.69%	-	-	-	10%	7.69	Pass
		SO ₂ at 7%O ₂ (Compared with RM)	ppm	19.29	18.69	-0.60	1.32	10.29%	20%	10.29	Pass	-	-	-
		CO ^{3/} at 7%O ₂ (Compared with emission Standard 690 ppm)	ppm	4.56	0.01	-4.56	1.16	0.83%	-	-	-	5%	0.83	Pass
		O ₂ ^{4/} (Compared with RM)	%	11.86	12.13	0.27	-	0.27%	1%	0.27%	Pass	-	-	-

Remark :
1/ Emission standard at WWI stack at 7% O₂: NO_x = 50 ppm, SO₂ = 28 ppm and CO = 690 ppm
2/ Compared with RM reference follow U.S. EPA-40 CFR Part 60 Appendix B (in case average of RM more than 50% of Emission Standard value)
3/ Compared with Emission Standard of the Plant (in case average of RM less than 50% of Emission Standard value)
4/ Notification of the Ministry of Industry, subjected "Industrial Emission Standards", dated December 4, 2006.

Table 7.1-2 Summary of RA Test Results at AOG Stack, PTT Asahi Chemical Co., Ltd., Rayong province on September 25, 2024

Stack name	Sampling Date	Parameter	Unit	CEMs	RM (SGS)	Diff.	CC	%RA	Compared with RM ^{1/}			Compared with Emission Standard ^{2/}		
									criteria	Value	Pass /Not Pass	criteria	Value	Pass /Not Pass
AOG Stack	Sep 25, 2024	NO _x ^{2/} at 7%O ₂ (Compared with emission Standard 10 ppm)	ppm	0.87	0.54	-0.33	0.03	3.69%	-	-	-	10%	3.69%	Pass
		SO ₂ at 7%O ₂ (Compared with emission Standard 28 ppm)	ppm	0.44	1.14	0.71	0.10	2.87%	-	-	-	10%	2.87%	Pass
		CO ^{3/} at 7%O ₂ (Compared with emission Standard 690 ppm)	ppm	22.71	10.72	-11.99	0.53	1.81%	-	-	-	5%	1.81%	Pass
		O ₂ ^{4/} (Compared with RM)	%	3.64	3.53	-0.12	-	0.12%	1%	0.12%	Pass	-	-	-

Remark :
1/ Emission standard at AOG stack at 7% O₂: NO_x = 10 ppm, SO₂ = 28 ppm and CO = 690 ppm
2/ Compared with RM reference follow U.S. EPA-40 CFR Part 60 Appendix B (in case average of RM more than 50% of Emission Standard value)
3/ Compared with Emission Standard of the Plant (in case average of RM less than 50% of Emission Standard value)
4/ Notification of the Ministry of Industry, subjected "Industrial Emission Standards", dated December 4, 2006.

Table 7.1-3 Summary of RA Test Results at SAR Stack, PTT Asahi Chemical Co., Ltd., Rayong province on September 26, 2024

Stack name	Sampling Date	Parameter	Unit	CEMs	RM (SGS)	Dif.	CC	%SA	Compared with rate [/]			Compared with Emission Standard ^{2/}		
									criteria	Value	Pass /Not Pass	criteria	Value	Pass /Not Pass
SAR Stack	Sep 26, 2024	NO _x ^{2/} at 7%O ₂ (Compared with emission standard 50 ppm)	ppm	12.78	12.99	0.21	0.31	1.04%	-	-	-	10%	1.04%	Pass
		SO ₂ ^{2/} at 7%O ₂ (Compared with emission standard 28 ppm)	ppm	13.60	13.55	-0.05	1.03	3.87%	-	-	-	10%	3.87%	Pass
		O ₂ ^{1/} (compared with RM)	%	4.00	3.78	-0.22	..	0.22%	1%	0.22%	Pass	-	-	-

Remark : - Emission standard at SAR stack at 7% O₂: NO_x = 50 ppm and SO₂ = 28 ppm
Sources : 1/ Compared with RM reference follow U.S. EPA 40 CFR Part 60 Appendix B (in case average of RM more than 50% of Emission Standard value)
2/ Compared with Emission Standard of the Plant (in case average of RM less than 50% of Emission Standard value)

RA Test
- WWI Stack



Report No. : 2024-500002566 / 001-1 (Page 1 of 4)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : NO_x MEASUREMENT DATE : September 27, 2024
MEASUREMENT LOCATION : WWI Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	NO _x						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs	RM	CEMs	RM	CEMs	RM	
1*	27/09/2024	10:41-11:01	1.46	4.56	2.24	7.25			5.00
2*	27/09/2024	11:02-11:22	1.32	4.30	2.04	6.82			4.78
3*	27/09/2024	11:23-11:43	1.34	4.05	2.06	6.41			4.36
4	27/09/2024	11:44-12:04	1.41	3.84	2.18	6.11			3.92
5	27/09/2024	12:05-12:25	1.28	3.96	1.98	6.31			4.33
6	27/09/2024	12:26-12:46	1.40	3.85	2.18	6.16			3.98
7	27/09/2024	12:47-13:07	1.69	3.37	2.63	5.42			2.79
8	27/09/2024	13:08-13:28	1.26	2.82	1.93	4.46			2.53
9	27/09/2024	13:29-13:49	1.31	3.25	1.99	5.08			3.09
10	27/09/2024	13:50-14:10	1.40	3.41	2.12	5.33			3.22
11	27/09/2024	14:11-14:31	1.20	3.47	1.80	5.41			3.60
12	27/09/2024	14:32-14:52	1.74	3.25	2.60	5.01			2.41
Average					2.16	5.48			
Confidence Coefficient							3.32		
Relative Accuracy (Compared with Emission standard NO _x = 50 ppm)							0.52		
Relative Accuracy Criteria (Compared with Emission standard NO _x = 50 ppm)							7.69%		
Conclusion							10%		
							Pass		

Remarks : * Sample with * is rejected data
Emission standard of the plant: NO_x at 7% O₂ = 50 ppm
Source : 1/ RA Criteria of NO_x is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 2 (PS-2)
and compared with emission standard of the plant.

TY/KM/WWI



Technical Manager

Unless otherwise stated the result shown in this test report refers to the sample(s) tested.

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Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: SO₂ MEASUREMENT DATE : September 27, 2024
MEASUREMENT LOCATION : WWI Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	SO ₂						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs	RM	CEMs	ppm	RM	ppm	
1*	27/09/2024	10:41-11:01	2.75	14.23	4.23	22.59			18.36
2	27/09/2024	11:02-11:22	12.68	13.12	19.54	20.81			1.27
3	27/09/2024	11:23-11:43	13.07	12.63	20.08	19.99			-0.09
4	27/09/2024	11:44-12:04	13.65	12.24	21.07	19.46			-1.61
5	27/09/2024	12:05-12:25	13.87	11.10	21.42	17.71			-3.70
6	27/09/2024	12:26-12:46	10.48	11.43	16.25	18.27			2.02
7*	27/09/2024	12:47-13:07	11.49	8.60	17.87	13.81			-4.06
8	27/09/2024	13:08-13:28	13.39	12.48	20.44	19.73			-0.71
9	27/09/2024	13:29-13:49	13.40	11.69	20.35	18.30			-2.05
10	27/09/2024	13:50-14:10	13.62	12.87	20.59	20.14			-0.45
11	27/09/2024	14:11-14:31	9.19	8.86	13.87	13.80			-0.07
12*	27/09/2024	14:32-14:52	13.64	9.60	20.38	14.82			-5.56
Average					19.29	18.69			-0.60
Confidence Coefficient									1.32
Relative Accuracy (Compared with RM)									10.29%
Relative Accuracy Criteria ¹⁾ (Compared with RM)									20 %
Conclusion									Pass

Remarks : * Sample with * is rejected data
Emission standard of the plant: SO₂ at 7% O₂ = 28 ppm
Source : 1/ RA Criteria of SO₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 2 (PS-2)

TY/KM/WWI



Technical Manager

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CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jakuljan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : O₂ MEASUREMENT DATE : September 27, 2024
MEASUREMENT LOCATION : WVI Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Korravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	O ₂		Diff
			CEMs %	RM %	
1	27/09/2024	10:41-11:01	11.87	12.14	0.27
2	27/09/2024	11:02-11:22	11.88	12.14	0.26
3	27/09/2024	11:23-11:43	11.85	12.12	0.26
4	27/09/2024	11:44-12:04	11.90	12.15	0.26
5	27/09/2024	12:05-12:25	11.90	12.19	0.29
6	27/09/2024	12:26-12:46	11.94	12.21	0.27
7	27/09/2024	12:47-13:07	11.96	12.25	0.29
8*	27/09/2024	13:08-13:28	11.79	12.10	0.31
9	27/09/2024	13:29-13:49	11.74	12.02	0.28
10*	27/09/2024	13:50-14:10	11.70	12.02	0.31
11	27/09/2024	14:11-14:31	11.69	11.97	0.28
12*	27/09/2024	14:32-14:52	11.59	11.89	0.30
Average			11.86	12.13	0.27
Relative Accuracy (Compared with RM)					
Relative Accuracy Criteria* (Compared with RM)			0.27%		
Conclusion			1%		
			Pass		

Remark : * Sample with * is rejected data
Source : 1/ RA Criteria of O₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B : Performance Specification 3 (PS-3)



Technical Manager

TYKMWIWI

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CONTACT : Khun Nuttawut Jakuljan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: CO MEASUREMENT DATE : September 27, 2024
MEASUREMENT LOCATION : WVI Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Korravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	CO						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs ppm	RM ppm	CEMs ppm	RM ppm	CEMs ppm	RM ppm	
1*	27/09/2024	10:41-11:01	5.54	1.00	8.53	1.58			-6.95
2*	27/09/2024	11:02-11:22	4.87	0.26	7.51	0.42			-7.09
3*	27/09/2024	11:23-11:43	4.68	0.06	7.19	0.09			-7.10
4	27/09/2024	11:44-12:04	3.86	0.00	5.97	0.00			-5.97
5	27/09/2024	12:05-12:25	3.26	0.00	5.03	0.00			-5.03
6	27/09/2024	12:26-12:46	2.77	0.00	4.29	0.01			-4.28
7	27/09/2024	12:47-13:07	1.76	0.00	2.73	0.00			-2.73
8	27/09/2024	13:08-13:28	3.82	0.01	5.83	0.02			-5.81
9	27/09/2024	13:29-13:49	3.71	0.00	5.64	0.00			-5.64
10	27/09/2024	13:50-14:10	4.08	0.02	6.17	0.03			-6.14
11	27/09/2024	14:11-14:31	1.46	0.00	2.21	0.00			-2.21
12	27/09/2024	14:32-14:52	2.15	0.00	3.21	0.00			-3.21
Average					4.56	0.01			-4.56
Confidence Coefficient									1.16
Relative Accuracy (Compared with Emission Standard, CO =690 ppm)									0.83
Relative Accuracy Criteria ¹ (Compared with Emission Standard, CO= 690 ppm)									5%
Conclusion									Pass

Remarks : * Sample with * is rejected data
Emission standard of CO at 7% O₂ = 690 ppm
Source : 1/ RA Criteria of CO is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 4 (PS-4) and compared with Industrial Emission Standards, Notification of the Ministry of Industry, B.E. 2549 (2006).



TYKMWIWI

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Report No. : 2024-500002566 / 001-2 (Page 1 of 4)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : NO_x MEASUREMENT DATE : September 25, 2024
MEASUREMENT LOCATION : AOG Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	NO _x						Diff	
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)					
			CEMs	RM	CEMs	RM	RM			
1	25/09/2024	11:31-11:51								-0.28
2	25/09/2024	11:52-12:12	0.98	0.63	0.79	0.51	0.53			-0.37
3	25/09/2024	12:13-12:33	1.11	0.66	0.90	0.53	0.54			-0.33
4*	25/09/2024	12:34-12:54	1.08	0.67	0.87	0.54	0.53			-0.43
5	25/09/2024	12:55-13:15	1.19	0.66	0.96	0.53	0.57			-0.31
6	25/09/2024	13:16-13:36	1.09	0.71	0.88	0.57	0.58			-0.33
7	25/09/2024	13:37-13:57	1.12	0.72	0.91	0.58	0.57			-0.30
8	25/09/2024	13:58-14:18	1.07	0.71	0.87	0.57	0.54			-0.30
9	25/09/2024	14:19-14:39	1.05	0.68	0.85	0.54	0.52			-0.42
10	25/09/2024	14:40-15:00	1.17	0.65	0.94	0.52	0.50			-0.36
11*	25/09/2024	15:01-15:21	1.07	0.63	0.87	0.50	0.54			-0.51
12*	25/09/2024	15:01-15:21	1.31	0.68	1.05	0.54	0.67			-0.43
12*	25/09/2024	15:22-15:42	1.37	0.84	1.09	0.67	0.54			-0.33
Average					0.87	0.54				0.03
Confidence Coefficient										3.69%
Relative Accuracy (Compared with Emission standard NO _x = 10 ppm)										10%
Relative Accuracy Criteria (Compared with Emission standard NO _x = 10 ppm)										Pass
Conclusion										

Remarks : * Sample with * is rejected data
Emission standard of the plant; NO_x at 7% O₂ = 10 ppm
Source : 1/ RA Criteria of NO_x is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 2 (PS-2)
and compared with emission standard of the plant.



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Technical Manager

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Report No. : 2024-500002566 / 001-2 (Page 2 of 4)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: SO₂ MEASUREMENT DATE : September 25, 2024
MEASUREMENT LOCATION : AOG Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Korravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YYYY)	Time	SO ₂						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs	RM	CEMs	RM	CEMs	RM	
1	25/09/2024	11:31-11:51	ppm	ppm	ppm	ppm	ppm	ppm	0.63
2	25/09/2024	11:52-12:12	0.72	1.39	0.58	1.12	0.53		0.53
3	25/09/2024	12:13-12:33	0.60	1.66	0.48	1.33	0.85		0.85
4*	25/09/2024	12:34-12:54	0.57	1.71	0.46	1.37	0.90		0.90
5*	25/09/2024	12:55-13:15	0.54	1.69	0.44	1.35	0.92		0.92
6	25/09/2024	13:16-13:36	0.49	1.48	0.40	1.18	0.78		0.78
7	25/09/2024	13:37-13:57	0.52	1.17	0.42	0.94	0.51		0.51
8	25/09/2024	13:58-14:18	0.42	1.38	0.34	1.11	0.77		0.77
9	25/09/2024	14:19-14:39	0.36	1.42	0.29	1.13	0.84		0.84
10*	25/09/2024	14:40-15:00	0.29	1.55	0.23	1.25	1.01		1.01
11	25/09/2024	15:01-15:21	0.48	1.46	0.38	1.16	0.77		0.77
12	25/09/2024	15:22-15:42	0.58	1.42	0.46	1.12	0.66		0.66
Average					0.44	1.14	0.71		0.71
Confidence Coefficient							0.10		
Relative Accuracy (Compared with Emission Standard SO ₂ = 28 ppm)							2.87%		
Relative Accuracy Criteria ¹⁾ (Compared with Emission Standard, SO ₂ =28 ppm)							10 %		
Conclusion							Pass		

Remarks : * Sample with * is rejected data
Emission standard of the plant: SO₂ at 7% O₂ = 28 ppm
Source : 1/ RA Criteria of SO₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B : Performance Specification 2 (PS-2) and compared with emission standard of the plant.



Technical Manager

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Report No. : 2024-500002566 / 001-2 (Page 3 of 4)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : O₂ MEASUREMENT DATE : September 25, 2024
MEASUREMENT LOCATION : AOG Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Korravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YYYY)	Time	O ₂		Diff
			CEMs	RM	
			%	%	
1	25/09/2024	11:31-11:51	3.69	3.62	-0.07
2	25/09/2024	11:52-12:12	3.70	3.53	-0.17
3	25/09/2024	12:13-12:33	3.70	3.53	-0.17
4*	25/09/2024	12:34-12:54	3.70	3.53	-0.17
5	25/09/2024	12:55-13:15	3.70	3.55	-0.15
6*	25/09/2024	13:16-13:36	3.68	3.49	-0.19
7*	25/09/2024	13:37-13:57	3.65	3.48	-0.17
8	25/09/2024	13:58-14:18	3.67	3.60	-0.07
9	25/09/2024	14:19-14:39	3.66	3.56	-0.10
10	25/09/2024	14:40-15:00	3.66	3.57	-0.10
11	25/09/2024	15:01-15:21	3.54	3.44	-0.10
12	25/09/2024	15:22-15:42	3.45	3.33	-0.12
Average			3.64	3.53	-0.12
Relative Accuracy (Compared with RM)					0.12%
Relative Accuracy Criteria ¹⁾ (Compared with RM)					1 %
Conclusion					Pass

Remark : * Sample with * is rejected data
Source : 1/ RA Criteria of O₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B : Performance Specification 3 (PS-3)



Technical Manager

TY/KM/WI/WI

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Report No. : 2024-500002566 / 001-2 (Page 4 of 4) Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED

CONTACT : Khun Nuttawut Jaksujan

ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150

Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air

SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: CO

MEASUREMENT LOCATION : AOG Stack, PTT Asahi Chemical Company Limited, Rayong province

MEASUREMENT DATE : September 25, 2024

MEASUREMENT BY : Korravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YYYY)	Time	CO						Diff
			Raw Data (at actual O ₂)			Corrected Value (at 7%O ₂)			
			CEMs		RM	CEMs		RM	
			ppm	ppm	ppm	ppm	ppm		
1	25/09/2024	11:31-11:51		27.70	14.86	22.38	11.95	-10.42	
2	25/09/2024	11:52-12:12		28.66	14.19	23.17	11.36	-11.81	
3	25/09/2024	12:13-12:33		29.29	13.77	23.67	11.02	-12.65	
4*	25/09/2024	12:34-12:54		29.53	13.15	23.86	10.52	-13.34	
5*	25/09/2024	12:55-13:15		29.37	13.11	23.73	10.50	-13.23	
6	25/09/2024	13:16-13:36		28.38	13.08	22.91	10.44	-12.47	
7	25/09/2024	13:37-13:57		27.97	13.12	22.54	10.47	-12.07	
8	25/09/2024	13:58-14:18		27.79	12.98	22.41	10.43	-11.99	
9	25/09/2024	14:19-14:39		27.77	12.84	22.39	10.29	-12.10	
10*	25/09/2024	14:40-15:00		28.03	12.10	22.61	9.70	-12.91	
11	25/09/2024	15:01-15:21		28.62	12.81	22.91	10.20	-12.72	
12	25/09/2024	15:22-15:42		27.61	13.08	21.99	10.35	-11.64	
Average						22.71	10.72	-11.99	
Confidence Coefficient								0.53	
Relative Accuracy (Compared with Emission Standard, CO =690 ppm)								1.81%	
Relative Accuracy Criteria* (Compared with Emission Standard, CO= 690 ppm)								5%	
Conclusion								Pass	

Remarks: * Sample with * is rejected data

Source: Emission standard of CO at 7% O₂ = 690 ppm

RA Criteria of CO is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 4 (PS-4) and compared with Industrial Emission Standards, Notification of the Ministry of Industry, B.E. 2549 (2006).

TYKMWIWI



SGS (THAILAND) LIMITED

Technical manager

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Report No. : 2024-500002566 / 001-3 (Page 1 of 3)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : NO_x MEASUREMENT DATE : September 26, 2024
MEASUREMENT LOCATION : SAR Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	NO _x						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs	RM	CEMs	RM	CEMs	RM	
1*	26/09/2024	11:31-11:51	18.95	17.96	15.72	14.66			-1.06
2*	26/09/2024	11:52-12:12	18.43	17.55	15.29	14.33			-0.95
3	26/09/2024	12:13-12:33	16.54	16.23	13.65	13.20			-0.45
4	26/09/2024	12:34-12:54	16.48	16.24	13.62	13.23			-0.40
5	26/09/2024	12:55-13:15	15.89	16.03	13.14	13.07			-0.08
6	26/09/2024	13:16-13:36	14.47	15.19	11.93	12.36			0.43
7	26/09/2024	13:37-13:57	14.59	15.17	12.03	12.35			0.32
8	26/09/2024	13:58-14:18	14.58	15.41	11.95	12.49			0.54
9	26/09/2024	14:19-14:39	15.17	15.85	12.45	12.85			0.40
10*	26/09/2024	14:40-15:00	15.38	16.39	12.61	13.28			0.67
11	26/09/2024	15:01-15:21	16.08	17.08	13.19	13.83			0.64
12	26/09/2024	15:22-15:42	15.94	16.70	13.05	13.51			0.46
Average					12.78	12.99			0.21
Confidence Coefficient									0.31
Relative Accuracy (Compared with Emission Standard NO _x = 50 ppm)									1.04%
Relative Accuracy Criteria ¹⁾ (Compared with Emission Standard NO _x = 50 ppm)									10%
Conclusion									Pass

Remarks : * Sample with * is rejected data
Emission standard of the plant; NO_x at 7% O₂ = 50 ppm
Source : 1/ RA Criteria of NO_x is referred to U.S. EPA 40 CFR Part 60, Appendix B: Performance Specification 2 (PS-2) and compared with emission standard of the plant.

TY/KM/WIWI

SGS (THAILAND) LIMITED

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Report No. : 2024-500002566 / 001-3 (Page 2 of 3)

Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED
CONTACT : Khun Nuttawut Jaksujan
ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-9359

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: SO₂ MEASUREMENT DATE : September 26, 2024
MEASUREMENT LOCATION : SAR Stack, PTT Asahi Chemical Company Limited, Rayong province
MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

No.	Date (DD/MM/YY)	Time	SO ₂						Diff
			Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)				
			CEMs	RM	CEMs	RM	ppm	ppm	
1	26/09/2024	11:31-11:51	15.59	17.72	12.93	14.46			1.53
2	26/09/2024	11:52-12:12	15.74	17.42	13.06	14.23			1.17
3	26/09/2024	12:13-12:33	15.93	18.27	13.15	14.86			1.71
4	26/09/2024	12:34-12:54	16.24	17.45	13.42	14.21			0.79
5	26/09/2024	12:55-13:15	16.57	16.28	13.71	13.28			-0.43
6	26/09/2024	13:16-13:36	16.68	15.36	13.75	12.50			-1.25
7*	26/09/2024	13:37-13:57	16.71	14.36	13.78	11.70			-2.08
8	26/09/2024	13:58-14:18	17.15	15.55	14.05	12.60			-1.45
9	26/09/2024	14:19-14:39	17.21	15.46	14.12	12.53			-1.59
10	26/09/2024	14:40-15:00	17.36	16.43	14.23	13.31			-0.92
11*	26/09/2024	15:01-15:21	17.40	19.97	14.27	16.17			1.90
12*	26/09/2024	15:22-15:42	17.38	21.47	14.23	17.36			3.13
Average					13.60	13.55			-0.05
Confidence Coefficient									1.03
Relative Accuracy (Compared with Emission Standard,SO ₂ = 28 ppm)									3.87%
Relative Accuracy Criteria ¹⁾ (Compared with Emission Standard, SO ₂ =28 ppm)									10 %
Conclusion									Pass

Remarks : * Sample with * is rejected data
Emission standard of the plant; SO₂ at 7% O₂ = 28 ppm
Source : 1/ RA Criteria of SO₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B : Performance Specification 2 (PS-2) and compared with emission standard of the plant.

TY/KM/WIWI

SGS (THAILAND) LIMITED

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Report No. : 2024-500002566 / 001-3 (Page 3 of 3) Issued date : October 9, 2024

CLIENT : PTT ASAHI CHEMICAL COMPANY LIMITED

CONTACT : Khun Nuttawut Jaksujan

ADDRESS : 8 Phangmuang Chapoh 3-1 Road, Huaypong Sub-District, Muang Rayong District, Rayong 21150
Tel. 094-516-3359

Analysis Report

SAMPLE DESCRIPTION : Emission Air

SAMPLE DESIGNATED AS : Relative Accuracy Test Audit: O₂

MEASUREMENT LOCATION : SAR Stack, PTT Asahi Chemical Company Limited, Rayong province

MEASUREMENT BY : Koravitch Malakul Na Ayuthaya

MEASUREMENT DATE : September 26, 2024

No.	Date (DD/MM/YY)	Time	O ₂		Diff
			CEMs %	RM %	
1*	26/09/2024	11:31-11:51	4.14	3.87	-0.27
2*	26/09/2024	11:52-12:12	4.15	3.88	-0.27
3	26/09/2024	12:13-12:33	4.06	3.81	-0.25
4*	26/09/2024	12:34-12:54	4.09	3.83	-0.26
5	26/09/2024	12:55-13:15	4.10	3.85	-0.25
6	26/09/2024	13:16-13:36	4.04	3.82	-0.22
7	26/09/2024	13:37-13:57	4.05	3.83	-0.21
8	26/09/2024	13:58-14:18	3.94	3.74	-0.19
9	26/09/2024	14:19-14:39	3.96	3.75	-0.21
10	26/09/2024	14:40-15:00	3.94	3.74	-0.20
11	26/09/2024	15:01-15:21	3.95	3.74	-0.21
12	26/09/2024	15:22-15:42	3.93	3.71	-0.22
Average			4.00	3.78	-0.22
Relative Accuracy (Compared with RM)			0.22%		
Relative Accuracy Criteria ^{1/} (Compared with RM)			1%		
Conclusion			Pass		

Remark : * Sample with * is rejected data

Source : 1/ RA Criteria of O₂ is referred to U.S. EPA 40 CFR Part 60, Appendix B : Performance Specification 3 (PS-3)



Technical Manager

TYKMWIWI

SGS (THAILAND) LIMITED

Unless otherwise stated the result shown in this test report refer only to the sample(s) tested.

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Appendix B

Company profile

Certificate of Accreditation SGS Laboratory

Index	Substance	Method
1	Acrylonitrile	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
2	Acetone	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
3	Alidin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
5	Antimony	Digestion, Inductively Coupled Plasma Method ⁸
6	Arsenic	Digestion, Inductively Coupled Plasma Method ⁸
7	Azadirachtin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
8	Barium	Digestion, Inductively Coupled Plasma Method ⁸
9	Benzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
10	Benzaldehyde	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
11	Benzobenzothiazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
12	Benzobenzothiazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
13	Benzic acid	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
14	Benzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
15	Benzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
16	Benzylamine	Digestion, Inductively Coupled Plasma Method ⁸
17	Bis(2-chloroethyl)amine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
18	Bis(2-ethylhexyl)amine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
19	Bromobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
20	Bromodichloromethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸

21 Butyl-

Index	Substance	Method
21	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
22	Cadmium	Digestion, Inductively Coupled Plasma Method ⁸
23	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
24	Carbon disulfide	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
25	Carbon tetrachloride	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
26	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
27	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
28	Chlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
29	Chlorobenzonitrile	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
30	Chloroform	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
31	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
32	Chromium	Digestion, Inductively Coupled Plasma Method ⁸
33	Chromium Hexavalent	Digestion, Inductively Coupled Plasma Method ⁸
34	Chromium Trivalent	Digestion, Inductively Coupled Plasma Method ⁸
35	Cyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
36	Cyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
40	DTT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸

41 Dibenz-

Index	Substance	Method
41	Dibenzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
42	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
43	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
44	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
45	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
46	1,3-Dichlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
47	1,1-Dichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
48	1,2-Dichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
49	1,1-Dichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
50	Di-n-2-Chloroethylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
51	Di-n-2-Chloroethylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
52	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
53	1,2-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
54	1,3-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
56	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
57	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
58	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸

59 2,4-Dichlorophenol-

Index	Substance	Method
59	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
60	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
61	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
62	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
63	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
64	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
65	Ethylbenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁸
66	Fluorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
67	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
68	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
69	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
71	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
72	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
73	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
74	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
75	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸
76	Heptachlor-1,2-bis(4-chlorophenyl)-3,4-dichloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁸

77 n-Heptane-

Ref.	Material	Method
77	n-Heptane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
78	Indene, 1,2,3-cyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
79	Heptanone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
80	Lead	Inductively Coupled Plasma Method
81	n-Nonane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
82	Mercury	Distillation, Cold Vapor Atomic Absorption Spectrometric Method
83	Methylcyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
84	Methyl bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
85	Methylcyclohexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
86	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
87	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
88	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
89	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
90	Nickel	Inductively Coupled Plasma Method
91	Nonanone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
92	N-Hexadecylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
93	N-Hexadecylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
94	Perfluorooctanol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
95	pH	Electrode Method
96	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method

97 Phenol

Ref.	Material	Method
97	Phenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
98	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
99	Selenium	Distillation, Inductively Coupled Plasma Method
100	Silver	Inductively Coupled Plasma Method
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
102	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
103	Tetrahydrofuran	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
105	Toluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
106	TPH (C ₆ -C ₈)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
107	TPH (C ₆ -C ₈)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
108	TPH (C ₆ -C ₈)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
112	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
113	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
114	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method
115	1,3,5-Trinitrobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
116	Vanadium	Distillation, Inductively Coupled Plasma Method

117 Vinyl

Ref.	Material	Method
117	Vinyl acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
118	Vinyl chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
120	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
122	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
123	Zinc	Distillation, Inductively Coupled Plasma Method

Appendix B: List of Materials

Ref.	Material	Method
1	Antimony	Inductively Coupled Plasma Method
2	Asenic	Inductively Coupled Plasma Method
3	Beryllium	Inductively Coupled Plasma Method
4	Calcium	Inductively Coupled Plasma Method
5	Carbon Monoxide	Instrumental Analysis Method
6	Chlorine	Inductively Coupled Plasma Method
7	Chromium	Inductively Coupled Plasma Method
8	Cobalt	Inductively Coupled Plasma Method
9	Copper	Inductively Coupled Plasma Method
10	Cristal	Inductively Coupled Plasma Method
11	Dioxin/Picram	Inductively Coupled Plasma Method

12 Hydrogen

Ref.	Material	Method
12	Hydrogen Chloride	Inductively Coupled Plasma Method
13	Hydrogen Sulfide	Inductively Coupled Plasma Method
14	Hydrogen Sulfide	Inductively Coupled Plasma Method
15	Lead	Inductively Coupled Plasma Method
16	Manganese	Inductively Coupled Plasma Method
17	Mercury	Inductively Coupled Plasma Method
18	Nickel	Inductively Coupled Plasma Method
19	Quartz	Inductively Coupled Plasma Method
20	Oxide of Nitrogen	Inductively Coupled Plasma Method
21	Tellurium	Inductively Coupled Plasma Method
22	Tin	Inductively Coupled Plasma Method
23	Total Suspended Particulate	Inductively Coupled Plasma Method
24	Selenium	Inductively Coupled Plasma Method
25	Sulfur Dioxide	Inductively Coupled Plasma Method
26	Sulfuric Acid	Inductively Coupled Plasma Method
27	Vanadium	Inductively Coupled Plasma Method
28	Xylene	Inductively Coupled Plasma Method

Inductively Coupled Plasma Method

Index	analyte	SP Method
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
102	1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
103	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
105	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
106	TPH (C ₆ -C ₈)	Microextraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
107	TPH (C ₆ -C ₈)	Microextraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
108	TPH (C ₆ -C ₈)	Microextraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
109	1,2,4-Trichlorobenzene	Ultrasonic Extraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
112	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
113	2,4,5-Trichlorophenol	Microextraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
114	2,4,6-Trichlorophenol	Microextraction, Gas Chromatographic / Mass Spectrometric Method ²⁴
115	1,3,5-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
116	Naphthalene	Digestion, Inductively Coupled Plasma Method ²⁴
117	Vinyl Acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
118	Vinyl Chloride	Spectrometric Method ²⁴

119 m-Xylene.

Index	analyte	SP Method
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
120	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
122	Xylene Total	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ²⁴
123	Zinc	Digestion, Inductively Coupled Plasma Method ²⁴

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2. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.
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6. United States Environmental Protection Agency, Standards of Performance for New Stationary Sources, 40 CFR 61, Appendix A, 2017.
7. United States Environmental Protection Agency, Standards of Performance for New Stationary Sources, 40 CFR 61, Appendix A, 2017.
8. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.
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11. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	12. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	13. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	14. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	15. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	16. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	17. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	18. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	19. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	20. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	21. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	22. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.
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23. United.

23. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	24. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.	25. United States Environmental Protection Agency, Test Methods for Evaluation Solid Waste Physical/Chemical Methods, SW-846 Method 8270C, 2013.
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Index	Substance	Method
28	Heavy Metal Chromium	Flotation, Colorimetric Method ¹
29	Lead	Digestion, Inductively Coupled Plasma Method ¹
30	Manganese	Digestion, Inductively Coupled Plasma Method ¹
31	Mercury	Digestion, Cold Vapor Atomic Absorption Spectrometric Method ¹
32	Methoxyflor	Liquid-Liquid Extraction, Gas Chromatographic Method ¹
33	Nickel	Digestion, Inductively Coupled Plasma Method ¹
34	Oil and Grease	Liquid-Liquid, Partition Gravimetric Method ¹
35	pH	Electrometric Method ¹
36	Phenols	Digestion, Direct Photometric Method ¹
37	Selenium	Digestion, Inductively Coupled Plasma Method ¹
38	Temperature	Field Method ¹
39	Total Chromium	Digestion, Inductively Coupled Plasma Method ¹
40	Total Dissolved Solids	Dried at 180 °C ¹
41	Total Related Nitrogen	Digestion, Distillation, Titrimetric Method ¹
42	Total Suspended Solids	Dried at 103-105 °C ¹
43	Toxicant Chromium	Digestion, Inductively Coupled Plasma Method ¹
44	Zinc	Flotation, Colorimetric Method ¹

Index	Substance	Method
1	Aromaphene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
2	Acetone	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ¹
3	Adren	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹

4 Anthracene

Index	Substance	Method
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
5	Antimony	Digestion, Inductively Coupled Plasma Method ¹
6	Asenic	Digestion, Inductively Coupled Plasma Method ¹
7	Azobine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
8	Bakum	Digestion, Inductively Coupled Plasma Method ¹
9	Benzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ¹
10	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
11	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
12	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
13	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
14	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
15	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
16	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
17	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
18	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
19	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
20	Benzofluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹

21 Beryl

Index	Substance	Method
21	Beryl	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
22	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
23	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
24	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
25	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
26	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
27	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
28	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
29	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
30	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
31	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
32	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
33	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
34	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
35	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
36	Cadmium	Digestion, Inductively Coupled Plasma Method ¹
37	Cadmium	Digestion, Inductively Coupled Plasma Method ¹

38 DCO

Index	Substance	Method
38	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
39	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
40	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
41	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
42	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
43	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
44	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
45	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
46	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
47	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
48	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
49	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
50	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
51	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹
52	DCO	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ¹

53 1,2-Dichlorobenzene

ร.ร.	สารเคมี	วิธีการ
53	1,2-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
54	1,3-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
55	1,5-Dichloropropane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
56	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
57	Dirhyl phthalate	Spectrometric Method ^g
58	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
59	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
61	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
62	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
63	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
64	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
65	Ethylbenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
66	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
67	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
68	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g

69 Heptachlor

ร.ร.	สารเคมี	วิธีการ
69	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
70	Heptachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
71	Heptachloro 1,3-benzodioxane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
72	Di-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
73	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
74	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
75	Heptachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
76	Heptachloropne	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
77	n-Heptane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
78	Indene 1,2,3-cyclopentene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
79	Isophenone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
80	Lead	Digestion, Inductively Coupled Plasma Method ^g
81	Manganese	Digestion, Inductively Coupled Plasma Method ^g
82	Mercury	Digestion, Cold Vapor Atomic Absorption Spectrometric Method ^g
83	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
84	Methyl Bromide	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g

85 Methylone

ร.ร.	สารเคมี	วิธีการ
85	Methylene Chloride	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
86	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
87	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
88	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
89	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
90	Nitral	Digestion, Inductively Coupled Plasma Method ^g
91	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
92	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
93	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
94	Permethrinophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
95	pH	Electrometric Method ^g
96	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
97	Phenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
98	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
99	Selenium	Digestion, Inductively Coupled Plasma Method ^g
100	Silver	Digestion, Inductively Coupled Plasma Method ^g
101	Styrene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g

102 1,2,2-Tetrachloroethane

ร.ร.	สารเคมี	วิธีการ
102	1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
103	Tetrachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
104	Toluene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
105	Toluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
106	Toluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
107	Toluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
108	Toluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
109	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
110	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
111	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
112	Trichlorobenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
113	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
114	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ^g
115	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g
116	Vanadium	Digestion, Inductively Coupled Plasma Method ^g
117	Vinyl acetate	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ^g

118 Vinyl chloride

Sl. No.	Sample	Method	Result
1	Water	Distillation	Distilled Water
2	Acetic Acid	Distillation	Distilled Acetic Acid
3	Alcohol	Distillation	Distilled Alcohol
4	Gasoline	Distillation	Distilled Gasoline
5	Oil	Distillation	Distilled Oil
6	Resin	Distillation	Distilled Resin
7	Wax	Distillation	Distilled Wax
8	Plastic	Distillation	Distilled Plastic
9	Paint	Distillation	Distilled Paint
10	Ink	Distillation	Distilled Ink
11	Food	Distillation	Distilled Food
12	Medicine	Distillation	Distilled Medicine
13	Chemical	Distillation	Distilled Chemical
14	Metals	Distillation	Distilled Metals
15	Minerals	Distillation	Distilled Minerals
16	Organic Compounds	Distillation	Distilled Organic Compounds
17	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
18	Polymers	Distillation	Distilled Polymers
19	Composites	Distillation	Distilled Composites
20	Alloys	Distillation	Distilled Alloys
21	Metals	Distillation	Distilled Metals
22	Minerals	Distillation	Distilled Minerals
23	Organic Compounds	Distillation	Distilled Organic Compounds
24	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
25	Polymers	Distillation	Distilled Polymers
26	Composites	Distillation	Distilled Composites
27	Alloys	Distillation	Distilled Alloys
28	Metals	Distillation	Distilled Metals
29	Minerals	Distillation	Distilled Minerals
30	Organic Compounds	Distillation	Distilled Organic Compounds
31	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
32	Polymers	Distillation	Distilled Polymers
33	Composites	Distillation	Distilled Composites
34	Alloys	Distillation	Distilled Alloys
35	Metals	Distillation	Distilled Metals
36	Minerals	Distillation	Distilled Minerals
37	Organic Compounds	Distillation	Distilled Organic Compounds
38	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
39	Polymers	Distillation	Distilled Polymers
40	Composites	Distillation	Distilled Composites
41	Alloys	Distillation	Distilled Alloys
42	Metals	Distillation	Distilled Metals
43	Minerals	Distillation	Distilled Minerals
44	Organic Compounds	Distillation	Distilled Organic Compounds
45	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
46	Polymers	Distillation	Distilled Polymers
47	Composites	Distillation	Distilled Composites
48	Alloys	Distillation	Distilled Alloys
49	Metals	Distillation	Distilled Metals
50	Minerals	Distillation	Distilled Minerals
51	Organic Compounds	Distillation	Distilled Organic Compounds
52	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
53	Polymers	Distillation	Distilled Polymers
54	Composites	Distillation	Distilled Composites
55	Alloys	Distillation	Distilled Alloys
56	Metals	Distillation	Distilled Metals
57	Minerals	Distillation	Distilled Minerals
58	Organic Compounds	Distillation	Distilled Organic Compounds
59	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
60	Polymers	Distillation	Distilled Polymers
61	Composites	Distillation	Distilled Composites
62	Alloys	Distillation	Distilled Alloys
63	Metals	Distillation	Distilled Metals
64	Minerals	Distillation	Distilled Minerals
65	Organic Compounds	Distillation	Distilled Organic Compounds
66	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
67	Polymers	Distillation	Distilled Polymers
68	Composites	Distillation	Distilled Composites
69	Alloys	Distillation	Distilled Alloys
70	Metals	Distillation	Distilled Metals
71	Minerals	Distillation	Distilled Minerals
72	Organic Compounds	Distillation	Distilled Organic Compounds
73	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
74	Polymers	Distillation	Distilled Polymers
75	Composites	Distillation	Distilled Composites
76	Alloys	Distillation	Distilled Alloys
77	Metals	Distillation	Distilled Metals
78	Minerals	Distillation	Distilled Minerals
79	Organic Compounds	Distillation	Distilled Organic Compounds
80	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
81	Polymers	Distillation	Distilled Polymers
82	Composites	Distillation	Distilled Composites
83	Alloys	Distillation	Distilled Alloys
84	Metals	Distillation	Distilled Metals
85	Minerals	Distillation	Distilled Minerals
86	Organic Compounds	Distillation	Distilled Organic Compounds
87	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
88	Polymers	Distillation	Distilled Polymers
89	Composites	Distillation	Distilled Composites
90	Alloys	Distillation	Distilled Alloys
91	Metals	Distillation	Distilled Metals
92	Minerals	Distillation	Distilled Minerals
93	Organic Compounds	Distillation	Distilled Organic Compounds
94	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
95	Polymers	Distillation	Distilled Polymers
96	Composites	Distillation	Distilled Composites
97	Alloys	Distillation	Distilled Alloys
98	Metals	Distillation	Distilled Metals
99	Minerals	Distillation	Distilled Minerals
100	Organic Compounds	Distillation	Distilled Organic Compounds

Sl. No.	Sample	Method	Result
1	Water	Distillation	Distilled Water
2	Acetic Acid	Distillation	Distilled Acetic Acid
3	Alcohol	Distillation	Distilled Alcohol
4	Gasoline	Distillation	Distilled Gasoline
5	Oil	Distillation	Distilled Oil
6	Resin	Distillation	Distilled Resin
7	Wax	Distillation	Distilled Wax
8	Plastic	Distillation	Distilled Plastic
9	Paint	Distillation	Distilled Paint
10	Ink	Distillation	Distilled Ink
11	Food	Distillation	Distilled Food
12	Medicine	Distillation	Distilled Medicine
13	Chemical	Distillation	Distilled Chemical
14	Metals	Distillation	Distilled Metals
15	Minerals	Distillation	Distilled Minerals
16	Organic Compounds	Distillation	Distilled Organic Compounds
17	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
18	Polymers	Distillation	Distilled Polymers
19	Composites	Distillation	Distilled Composites
20	Alloys	Distillation	Distilled Alloys
21	Metals	Distillation	Distilled Metals
22	Minerals	Distillation	Distilled Minerals
23	Organic Compounds	Distillation	Distilled Organic Compounds
24	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
25	Polymers	Distillation	Distilled Polymers
26	Composites	Distillation	Distilled Composites
27	Alloys	Distillation	Distilled Alloys
28	Metals	Distillation	Distilled Metals
29	Minerals	Distillation	Distilled Minerals
30	Organic Compounds	Distillation	Distilled Organic Compounds
31	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
32	Polymers	Distillation	Distilled Polymers
33	Composites	Distillation	Distilled Composites
34	Alloys	Distillation	Distilled Alloys
35	Metals	Distillation	Distilled Metals
36	Minerals	Distillation	Distilled Minerals
37	Organic Compounds	Distillation	Distilled Organic Compounds
38	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
39	Polymers	Distillation	Distilled Polymers
40	Composites	Distillation	Distilled Composites
41	Alloys	Distillation	Distilled Alloys
42	Metals	Distillation	Distilled Metals
43	Minerals	Distillation	Distilled Minerals
44	Organic Compounds	Distillation	Distilled Organic Compounds
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46	Polymers	Distillation	Distilled Polymers
47	Composites	Distillation	Distilled Composites
48	Alloys	Distillation	Distilled Alloys
49	Metals	Distillation	Distilled Metals
50	Minerals	Distillation	Distilled Minerals
51	Organic Compounds	Distillation	Distilled Organic Compounds
52	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
53	Polymers	Distillation	Distilled Polymers
54	Composites	Distillation	Distilled Composites
55	Alloys	Distillation	Distilled Alloys
56	Metals	Distillation	Distilled Metals
57	Minerals	Distillation	Distilled Minerals
58	Organic Compounds	Distillation	Distilled Organic Compounds
59	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
60	Polymers	Distillation	Distilled Polymers
61	Composites	Distillation	Distilled Composites
62	Alloys	Distillation	Distilled Alloys
63	Metals	Distillation	Distilled Metals
64	Minerals	Distillation	Distilled Minerals
65	Organic Compounds	Distillation	Distilled Organic Compounds
66	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
67	Polymers	Distillation	Distilled Polymers
68	Composites	Distillation	Distilled Composites
69	Alloys	Distillation	Distilled Alloys
70	Metals	Distillation	Distilled Metals
71	Minerals	Distillation	Distilled Minerals
72	Organic Compounds	Distillation	Distilled Organic Compounds
73	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
74	Polymers	Distillation	Distilled Polymers
75	Composites	Distillation	Distilled Composites
76	Alloys	Distillation	Distilled Alloys
77	Metals	Distillation	Distilled Metals
78	Minerals	Distillation	Distilled Minerals
79	Organic Compounds	Distillation	Distilled Organic Compounds
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84	Metals	Distillation	Distilled Metals
85	Minerals	Distillation	Distilled Minerals
86	Organic Compounds	Distillation	Distilled Organic Compounds
87	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
88	Polymers	Distillation	Distilled Polymers
89	Composites	Distillation	Distilled Composites
90	Alloys	Distillation	Distilled Alloys
91	Metals	Distillation	Distilled Metals
92	Minerals	Distillation	Distilled Minerals
93	Organic Compounds	Distillation	Distilled Organic Compounds
94	Inorganic Compounds	Distillation	Distilled Inorganic Compounds
95	Polymers	Distillation	Distilled Polymers
96	Composites	Distillation	Distilled Composites
97	Alloys	Distillation	Distilled Alloys
98	Metals	Distillation	Distilled Metals
99	Minerals	Distillation	Distilled Minerals
100	Organic Compounds	Distillation	Distilled Organic Compounds

Sl. No.	Enzyme	Prepared
1	Alfin	Ureanase Distillation, Gas Chromatographic Method ¹⁰⁴
2	Amylase	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
3	Aspartic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
5	Bovylase	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
6	Calcium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴

Sl. No.	Chemical	Method
1	Urea	Urea Nitrogen, Gas Chromatographic Method ⁹⁴
2	Ammonia	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Waste Extraction, Colorimetric Method, Cadmium ⁹⁴
3	Hydrogen Cyanide	Digestion, Inductively Coupled Plasma Method ⁹⁴
4	Formaldehyde	Absorbance Detection, Colorimetric Method, Calculation Method ⁹⁴
5	Chromium (VI)	1) Waste Extraction, Digestion, Colorimetric Method ⁹⁴ 2) Absorbance Detection, Colorimetric Method ⁹⁴
6	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
7	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
8	Diiodine	Digestion, Inductively Coupled Plasma Method ⁹⁴
9	DDT	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
10	DDE	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
11	DDE	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
12	DDT	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
13	2,4-D	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
14	2,4-D (2,4-Dichlorophenoxyacetic acid)	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
15	Endrin	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
16	Heptachlor	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
17	Mopone	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴
18	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁹⁴ 2) Digestion, Inductively Coupled Plasma Method ⁹⁴
19	Hydrogen	Ultrasonic Extraction, Gas Chromatographic Method ⁹⁴

S.No	Substance	Method
23	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrophotometric Method ¹⁴
24	Methoxychlor	1) Waste Extraction, Gas Chromatographic Method ¹⁴
25	Minox	1) Waste Extraction, Gas Chromatographic Method ¹⁴
26	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ¹⁴
27	Polychlorinated Biphenyls (PCBs)	2) Digestion, Inductively Coupled Plasma Method ¹⁴
28	Permethrin	1) Waste Extraction, Gas Chromatographic Method ¹⁴
29	PCBs	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ¹⁴
30	Selenium	2) Digestion, Inductively Coupled Plasma Method ¹⁴
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ¹⁴
32	Silver, 2,4,5-Trichlorophenylpropionic acid	2) Digestion, Inductively Coupled Plasma Method ¹⁴
33	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ¹⁴
34	Thallium	2) Digestion, Inductively Coupled Plasma Method ¹⁴

Index	Sample	Technique
33	Total Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method, Waste Extraction, Columnaric Method, Calculation 2) Digestion, Inductively Coupled Plasma Atomic Emission, Spectrophotometry Method, Method ²⁰
34	Tungsten	Waste Extraction, Gas Chromatographic Method ²⁰
35	Trichloroethylene	Purge and Trap, Gas Chromatography/Water Spectrometric Method ²⁰
36	Vanadium	1) Waste Extractions, Digestion, Inductively Coupled Plasma Method ²⁰ 2) Digestion, Inductively Coupled Plasma Method ²⁰
37	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ²⁰ 2) Digestion, Inductively Coupled Plasma Method ²⁰

1. กรมส่งเสริมการค้าระหว่างประเทศ กระทรวงพาณิชย์, พ.ศ. 2564, การส่งออกสินค้าเกษตรและผลิตภัณฑ์เกษตรแปรรูปสู่ตลาดโลก ฉบับที่ 8 ประจำปี 2564
2. กรมปศุสัตว์, แนวทางการดำเนินงานการนำเข้า-ส่งออกสัตว์น้ำมีชีวิต, สืบค้น ณ วันที่ ๑ ตุลาคม ๒๕๖๔
3. APHA, WWA, Standard Methods for the Examination of Water and Wastewater, 24th ed., Washington, DC: APHA, 2007.
4. United States Environment Protection Agency, Test Methods for Evaluation Solid Waste Physical-Chemical Methods, Ultrasonic Titration, SW-846 Method 300C-2007.
5. United States Environment Protection Agency, Test Method 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, Polyhalogenated Biphenyls (PCBs) by Gas Chromatography, SW-846 Method 8092A, 2007.

... continued



แบบ กฐน/กฐน 2
Form NSC/TIS 2

ใบรับรองที่ 22-80007
(Certificate No.)

ใบรับรองระบบงาน (Certificate of Accreditation)

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑
(By Virtue of National Standardization Act B.E. 2551, (2008))

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Secretary-General, Thai Industrial Standards Institute)

ออกใบรับรองฉบับนี้ให้
(Issues this certificate to)

บริษัท เอสจีเอส (ประเทศไทย) จำกัด
SGS (Thailand) Limited

ตั้งอยู่เลขที่
(Address)

๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร
(100 Nanglijee Road, Chongpradue, Yananwa, Bangkok)

ได้รับการรับรองความสามารถ
(Certificate of competence)

ตามมาตรฐานเลขที่ มอก. ๑๗๐๒๐ - ๒๕๕๖
(Standard No. ISO/IEC 17020 : 2012)

การตรวจสอบและรับรองข้อกำหนดสำหรับหน่วยตรวจ
(Conformity assessment — Requirements for the operation of various types of bodies performing inspection)

หมายเลขการรับรองที่ หน่วยตรวจ ๐๐๓๔
(Accreditation No. INSPECION 0034)

โดยมีรายละเอียดสาขาและขอบข่ายที่ได้รับรอง แสดงไว้ใน QR CODE และ www.tisi.go.th
(Details of the scheme and scope of the certificate are shown in QR CODE and www.tisi.go.th)

ออกให้ ณ วันที่ ๓๑ มกราคม พ.ศ. ๒๕๖๕
(Issue date : 31 January B.E. 2565 (2022))

(นายเอกนิติ รฆมานนท์)
รองเลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
ปฏิบัติราชการแทน
เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Ministry of Industry Thailand, Thai Industrial Standards Institute)



กรมมาตรฐานผลิตภัณฑ์อุตสาหกรรม
ใบรับรองที่ 22-80007

ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด
ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด
ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด

29 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐
30 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐
31 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐

หมายเลขใบรับรอง : ๒๒-๘๐๐๐๗
ประเภทของระบบงาน : ๐๐๓๔

หมวดหมู่ / สาขาการตรวจ	รายละเอียดการตรวจ	ข้อกำหนด
1. เครื่องมือวัด : เครื่องวัดความยาว (โดยทั่วไป) (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ
2. ผลิตภัณฑ์ : การตรวจวัดความยาว (โดยทั่วไป) (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ
3. ระบบ : ระบบ (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ

ฉบับนี้ให้ใช้บังคับตั้งแต่วันที่ ๑๑ มกราคม พ.ศ. ๒๕๖๕
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หน้า 1/5



กรมมาตรฐานผลิตภัณฑ์อุตสาหกรรม
ใบรับรองที่ 22-80007

ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด
ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด
ผู้ตรวจระบบงาน : บริษัท เอสจีเอส (ประเทศไทย) จำกัด

29 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐
30 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐
31 สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
เลขที่ ๑๐๐ ถนนนางลิ้นจี่ แขวงช่องนนทรี เขตยานนาวา กรุงเทพมหานคร ๑๐๐

หมายเลขใบรับรอง : ๒๒-๘๐๐๐๗
ประเภทของระบบงาน : ๐๐๓๔

หมวดหมู่ / สาขาการตรวจ	รายละเอียดการตรวจ	ข้อกำหนด
4. เครื่องมือวัด : เครื่องวัดความยาว (โดยทั่วไป) (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ
5. ผลิตภัณฑ์ : การตรวจวัดความยาว (โดยทั่วไป) (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ
6. ระบบ : ระบบ (โดยทั่วไป)	การตรวจวัดความยาว (โดยทั่วไป) - ความยาว - ความกว้าง - ความสูง - ความหนา	- มาตรฐานผลิตภัณฑ์อุตสาหกรรม P-802-WS-001 - ข้อกำหนดเฉพาะ

ฉบับนี้ให้ใช้บังคับตั้งแต่วันที่ ๑๑ มกราคม พ.ศ. ๒๕๖๕
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หน้า 2/5



ศูนย์พัฒนาศักยภาพ
คนงานและการฝึกอบรม

หัวข้อ/สาระการเรียนรู้	เนื้อหา
6. สุขภาพ : - ความหมาย - ประเภท - การส่งเสริมสุขภาพ - การป้องกันโรค	การดูแลสุขภาพ - การดูแลสุขภาพ - การดูแลสุขภาพ
7. สุขภาพ : - ความหมาย - ประเภท - การส่งเสริมสุขภาพ - การป้องกันโรค	การดูแลสุขภาพ - การดูแลสุขภาพ - การดูแลสุขภาพ
8. สุขภาพ : - ความหมาย - ประเภท - การส่งเสริมสุขภาพ - การป้องกันโรค	การดูแลสุขภาพ - การดูแลสุขภาพ - การดูแลสุขภาพ

คณะวิศวกรรมศาสตร์ ปีที่ 11 กันยายน พ.ศ. 2563
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



ชื่อสถาบัน
หมายเลขการรับเรื่อง
ประเภทของงาน

[illegible]

หนังสือพิมพ์รายวันฉบับที่ 11 ที่ผ่าน พ.ศ. 2561
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

ศาสตราจารย์ ดร. วรวิทย์

บุคคลผู้ / ทางการตรวจ	ผู้ตรวจ
10. หมายเหตุ :	การตรวจเอกสาร และการสัมภาษณ์
ข้อมูลและเอกสารที่เกี่ยวข้อง (เฉพาะส่วนที่เกี่ยวข้อง ด้านวิชาการ)	

หมายเหตุ : * สาขานโยบายและกิตติคุณในการบริหารของเทศบาล



Scope of Accreditation for Inspection Body
Certificate No. 22-80007

Name of Inspection Body : SGS (Thailand) Limited
Addresses and contact details

Head office or primary location
100 Nanglinchee Road, Chongjin, Yunnan,
Bangkok

Category / Field of Inspection	Stage and In-Process Inspection of the Item with the General	Pre-shipment condition of the product and
1. Apparel : Ready-made Garment (Head Office)	- General - Style - Quantity (Pre-shipment)	- Pre-shipment condition of the product and
2. Food Products : Food Inspection (Head Office and Visit Branch)	- General - Style - Quantity (Pre-shipment)	- Pre-shipment condition of the product and
3. Motor Vehicle : Automotive (Head Office)	- General - Style - Quantity (Pre-shipment)	- Pre-shipment condition of the product and

Date of initial issue: 11 September B.E. 2561 (2018)
Ministry of Industry Thailand, Thai Industrial Standards Institute



Scope of Accreditation for Inspection Body

Certificate No. 22-80007

Name of Inspection Body : SGS (Thailand) Limited
Accreditation No. : INSPECTION 0034
Type of Inspection Body : Type A

Category / Field of Inspection	Stage and Range of Inspection	Inspection Requirements or Criteria
4. Machinery : LPG Cylinder (Head Office)	Production process and quality control inspection with the items as follows : - Component parts - Welding - Mechanical, hydraulic pressure tank, volumetric expansion, burst test and capacity check - Pre-delivery inspection	- Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements
5. Agricultural Products : Thai Hom Mali Rice (Head Office and Mahabulachetnam Office)	Pre-shipment inspection with the items as follows : - Quantity - Quality - Purity - Moisture - Foreign matter - Insects (larvae, pupae, eggs, etc.) - Rice and fractions that may be present (damaged kernels, yellow streak, chaffy kernels, etc.) - Milling degree - Not counting the purity check by laboratory analysis for determination of Amylose content and Adair's spreading value	- Notification of Ministry of Commerce on Criteria and procedures of operating the inspection of quality and purity of rice in accordance with the standards of Thai Hom Mali Rice - Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements

Date of initial issue: 11 September B.E. 2541 (2018)

Ministry of Industry Thailand, Thai Industrial Standards Institute

Page 2/3



Scope of Accreditation for Inspection Body

Certificate No. 22-80007

Name of Inspection Body : SGS (Thailand) Limited
Accreditation No. : INSPECTION 0035
Type of Inspection Body : Type A

Category / Field of Inspection	Stage and Range of Inspection	Inspection Requirements or Criteria
6. Agricultural Products : White sugar and raw sugar (Head Office and Mahabulachetnam Office)	General appearance and quantity inspection Including analysis by laboratory testing	- Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements
7. Bulk Solids : Coal, cement, gypsum, iron ore, etc. (Head Office, Special Office and Mahabulachetnam Office)	General appearance inspection and sampling	- Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements
8. Manufacturing Inspection for product certification (Head Office)	Production process and quality control inspection including inspection of the following group of products : - Construction materials, concrete, sanitary ware, ceramics, and furniture - Electrical lighting and similar appliances - Electrical power devices - Electrical appliances - Electronic appliances, parts, and components - Consumer goods and toys - Rubbers, chemicals, textiles, plastics, and food products, and food products - Automotive products, parts, and mechanical products	- Criteria for product certification of manufacturing inspection for product certification on Criteria for the relevant particular requirements and Thai Industrial Standards for product certification - Operating procedure of SGS (Thailand) Limited : TH-IP-021

Date of initial issue: 11 September B.E. 2541 (2018)

Ministry of Industry Thailand, Thai Industrial Standards Institute

Page 3/5



Scope of Accreditation for Inspection Body

Certificate No. 22-80007

Name of Inspection Body : SGS (Thailand) Limited
Accreditation No. : INSPECTION 0034
Type of Inspection Body : Type A

Category / Field of Inspection	Stage and Range of Inspection	Inspection Requirements or Criteria
9. Environmental (Head Office)	Indoor Environment Inspection with the items as follows : - Sound level - Heat stress - CO, CO ₂ , PM ₁₀ , Ozone, Total VOCs - Relative humidity - Air velocity - Light intensity	- Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements
10. Agricultural Products : Wheat and soybean meal (Head Office and Special Office)	General appearance inspection, sampling, and weighing observation	- Operating procedure of SGS (Thailand) Limited : PH-TH-MS-011 - Customer's requirements

Note : * Extent scope (December B.E. 2544 (2021))

Valid from : 8 December B.E. 2544 (2021)
Until : 10 September B.E. 2559 (2026)
Issue Date : 31 January B.E. 2545 (2022)

Date of initial issue: 11 September B.E. 2541 (2018)

Ministry of Industry Thailand, Thai Industrial Standards Institute

Page 5/5

ABS Quality Evaluations Certificate Of Conformance

ISO 9001:2015
This is to certify that the Quality Management System of

SGS (Thailand) Ltd.
100 Nanglinchee Road
Chongnonsi, Nonthaburi
Bangkok 11140
Thailand



PROVISION OF PHYSICAL INSPECTION, TESTING, CONTROL, AND CERTIFICATION
AND
CERTIFICATION

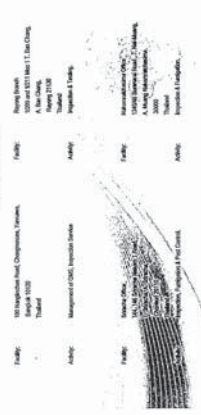
Certificate No: 22229
Issue Date: 15 July 2023
Expiration Date: 14 July 2025
Revision Date: 29 July 2023

Validity of this certificate is based on the successful completion of the audit. The scope of the certificate is limited to the system. Subject to the conditions of the certificate, the certificate holder is responsible for maintaining the system in accordance with the requirements of the standard. The certificate holder is responsible for ensuring that the system is maintained in accordance with the requirements of the standard. The certificate holder is responsible for ensuring that the system is maintained in accordance with the requirements of the standard.

ABS Quality Evaluations Certificate Of Conformance

ISO 9001:2015
This is to certify that the Quality Management System of

SGS (Thailand) Ltd.
100 Nanglinchee Road
Chongnonsi, Nonthaburi
Bangkok 11140
Thailand



PROVISION OF PHYSICAL INSPECTION, TESTING, CONTROL, AND CERTIFICATION
AND
CERTIFICATION

Certificate No: 22229
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ABS Quality Evaluations Certificate Of Conformance

ISO 9001:2015
This is to certify that the Quality Management System of

SGS (Thailand) Ltd.
100 Nanglinchee Road
Chongnonsi, Nonthaburi
Bangkok 11140
Thailand



PROVISION OF PHYSICAL INSPECTION, TESTING, CONTROL, AND CERTIFICATION
AND
CERTIFICATION

Certificate No: 22229
Issue Date: 15 July 2023
Expiration Date: 14 July 2025
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Validity of this certificate is based on the successful completion of the audit. The scope of the certificate is limited to the system. Subject to the conditions of the certificate, the certificate holder is responsible for maintaining the system in accordance with the requirements of the standard. The certificate holder is responsible for ensuring that the system is maintained in accordance with the requirements of the standard. The certificate holder is responsible for ensuring that the system is maintained in accordance with the requirements of the standard.

This is to certify that

SGS (Thailand) Limited

Address of premises : Eastern Seaboard Industrial Estate,
Premises 1 : Ta Su, Phraksaeng District,
Bangkok 10140, Thailand

Premises 2 : 1209, 1211 Pao 1, Soi Sukhumvit 2, Sukhumvit Road,
Bang Ching, Ban Ching District,
Bangkok 10138, Thailand

has been assessed and found to be conforming to the requirements of
TS 14001-2559 (ISO 14001:2015)

for the scope :

Premises 1 : Automotive Laboratory
Premises 2 : Environmental Laboratory

By **Yongchai Pajjasthane**
President

Signature

Date

24 January 2023

27 January 2025

24 January 2028

24 January 2030

24 January 2032

24 January 2034

24 January 2036

24 January 2038

24 January 2040

24 January 2042

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24 January 2280

24 January 2282

24 January 2284

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24 January 2296

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24 January 2300

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24 January 2526

24 January 2528

24 January 2530

24 January 2532

24 January 2534

24 January 2536

24 January 2538

24 January 2540

24 January 2542

ABS Quality Evaluations

ISO 45001:2018
Certificate Of Conformance

ANNEX
Certificate No. 61139

SGS (Thailand) Ltd.
At Below Facilities:

Facility: Eastern Industrial Office, Asean's Laboratory Services
100/101 Sukhvithee Road, Sukhvithee, Bangkok 10110, Thailand

Address: Eastern Industrial Office, Asean's Laboratory Services
100/101 Sukhvithee Road, Sukhvithee, Bangkok 10110, Thailand


Activity: Testing



Validity of this certificate may be confirmed at www.abs-qe.com

Page 1 of 1

ตัวอย่างการสอบเทียบระบบ CEMS โดยโครงการ (Internal Check)

 PTT Asahi Chemical Co., Ltd.		TEST AND CALIBRATION REPORT FOR CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)		Mo. No.: _____ Page No.: _____				
Area: <u>AN</u>		Location: <u>AOG</u>						
Tag Number: <u>GAT-9131, GAT-9132, GCOT-913, GOST-913</u>								
ANALYZER INFORMATION								
1	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	ULTRAMAT 6		
	S/N:		Parameter:	CO, NO, SO2				
2	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	OXYMAT 61		
	S/N:		Parameter:	Oxygen (O2)				
3	Anal Type:		Brand:		Model:			
	S/N:		Parameter:					
STANDARD GAS INFORMATION								
Gas Type	Std Conc.	Unit	Certificate Number	Cer. Date	Expire Date	CGA		
CO	80.1	ppm	3055/23	01/11/2023	31/10/2024	660		
NO	81.7	ppm	3055/23	01/11/2023	31/10/2024	660		
SO2	81.0	ppm	3055/23	01/11/2023	31/10/2024	660		
O2	20.9	%Vol	1003/24	27/03/2024	26/03/2024	690		
N2	Balance	%				680		
ASFOUND / VALIDATION								
Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (+/- 5% FS)	Idel	Actual	Error (+/- 5% FS)
GCOT-913 CO	0 - 100	ppm	0.00	-3.32	-3.32	80.1	77.87	-2.78
GAT-9132 SO2	0 - 100	ppm	0.00	-4.82	-4.82	81.0	76.71	-6.53
GAT-9131 NOx	0 - 100	ppm	0.00	1.16	1.16	81.7	78.83	-3.51
GOST-913 O2	0 - 25	%Vol	0.00	-0.43	-1.72	20.9	20.34	-2.68
CALIBRATION								
Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (+/- 5% FS)	Idel	Actual	Error (+/- 5% FS)
GCOT-913 CO	0 - 100	ppm	0.00	0.02	0.02	80.1	80.1	0.00
GAT-9132 SO2	0 - 100	ppm	0.00	0.04	0.04	81.0	81.0	0.00
GAT-9131 NOx	0 - 100	ppm	0.00	-0.02	-0.02	81.7	81.7	0.00
GOST-913 O2	0 - 25	%Vol	0.00	0.02	0.02	20.9	20.9	0.00
Note: <div style="text-align: center; font-size: 1.2em;">- Test standard gas and calibrate.</div>								
Reported By: [REDACTED]			Date: <u>17/09/2024</u>					



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

Area:

AN

Location:

Tag Number:

GAT-9131, GAT-9132, GDOT-913, GDOT-913

Sampling Handling System

Item	Description	Set point	Actual	Remark
1	Z-Purge	Green	/	
2	Air Conditioner	Cool	/	
3	Instrument Air Supply	Supply	/	
4	Heated Probe Box			
4.1	Filter Probe	Clean	/	
4.2	Heated Probe	Heat 120 °C	120 °C	
4.3	BB System	Normal	/	
5	Heated Sample Line			
5.1	Heated line Temp.	Heat 120 °C	120 °C	
5.2	Sample line tube	Clean	/	
6	Sample Gas Cooler			
6.1	Cooler Temp	3.0 - 5.0 °C	3 °C	
6.2	Auto drain	Rotate	/	
6.3	Peristaltic pump hose	Normal	/	
7	Sample Pump	Run	/	
8	Coalescing Filter	Clean	/	
9	Moisture Controller	Normal	/	
10	Moisture Sensor	Normal	/	
11	Perma Pure Dryer	Clean	/	
12	NO2/NO Converter	Heat	/	
13	DFU Filter	Clean	/	
14	Air Pressure Regulator (PR1)	0.5 kg/cm2	0.5	
15	Air Pressure Regulator (PR2)	3.5 kg/cm3	3.5	
16	Cal. Gas Flow (FL-1)	0.0 L/h.	0	
17	Bypass Flow (FL-2)	OFF	/	Always off
18	CO/SO2/NOx Sample Flow (FL-3)	60 L/h.	60	
19	O2 Sample Flow (FL-4)	40 L/h.	40	
20	Air Pure Perma Pure (FL-5)	5 L/m.	5	
21	Calibration Switch Control	OFF Position	/	
22	N2 Gas Pressure in Cylinder	> 500 psi.	1300 / PSI	
23	O2 Gas Pressure in Cylinder	> 500 psi.	1400 / PSI	
24	Mix Gas Pressure in Cylinder	> 500 psi.	1400 / PSI	
25	PLC Operation	Normal	/	

Note:

Reported By :

Date:

17/10/2024



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

OPACITY INFORMATION

Area:	AN	Location:	AOG
Tag Number:	OTSPT-913		

ANALYZER INFORMATION

Brand:	Durag	Model:	D-R 290	S/N:	
Dust Range: (mg/m3)	0 - 100	b Factor:		O/P:	4-20 mA

EQUIPMENT CHECK LIST

Item	Description	Set Point	Actual	Remark
1	Blower#1	Running	OK	
2	Filter Blower	Clean	Clean	
3	Fail Safe Shutter#A	Normal	OK	
4	Fail Safe Shutter#B	Normal	OK	
5	Display Unit (AZ)	Normal	OK	
6	Evaluation Unit (AW)	Normal	OK	

AUDIT FILTER INFORMATION

Item	Attenuation	Certificate Number	Expire Date
1	12.4%		
2	19.8%		
3	34.9%		

OPACITY CHECK & CALIBRATE

Item	Description	Set Point	Actual	
			Before	After
1	Dust Sample Reading (mg/m3)	-	3.22 mg/m3	3.18 mg/m3
2	Opacity Sample Reading (%)	-	- %	- %
2	Zero Check	0.0%	0.3 %	0.0 %
3	Span Check	71.0%	71.6 %	71.0 %
4	Window Check	<6.0%	0.5 %	0.2 %

AUDIT FILTER CHECK

Attenuation	Before			After			Remark
	Idel	Actual	Error (+/- 5%)	Idel	Actual	Error (+/- 5%)	
12.4%	12.4			12.4			
19.8%	19.8			19.8			
34.9%	24.9			24.9			

Note:

- Test zero/span opacity check

Reported By: _____

Date: 17/09/2024



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

Area:	AN	Location:	NWT
Tag Number:	WAT-9131, WAT-9132, WCOT-913, WD2T-913		

ANALYZER INFORMATION

1	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	ULTRAMAT 6
	S/N:		Parameter:	CO, NO, SO2		
2	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	OXYMAT 61
	S/N:		Parameter:	Oxygen (O2)		
3	Anal Type:		Brand:		Model:	
	S/N:		Parameter:			

STANDARD GAS INFORMATION

Gas Type	Std Conc.	Unit	Certificate Number	Cer. Date	Expire Date	CGA
CO	80.5	ppm	1097 / 24	26/04 / 2024	26/04/2027	660
NO	82.1	ppm	1099 / 24	26/04 / 2024	26/04/2027	660
SO2	77.7	ppm	1097 / 24	26/04 / 2024	26/04/2027	660
O2	21.1	%Vol	1007 / 24	27/03 / 2024	26/03/2026	590
N2	Balance	%				580

ASFOUND / VALIDATION

Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (1/-5% FS)	Idel	Actual	Error (1/-5% FS)
WCOT-913 CO	0 - 100	ppm	0.00	-1.60	-1.60	80.5	77.68	-3.80
WAT-9132 SO2	0 - 100	ppm	0.00	-3.26	-3.26	77.7	74.87	-3.64
WAT-9131 NOx	0 - 100	ppm	0.00	-2.33	-2.33	82.1	80.30	-2.19
WD2T-913 O2	0 - 25	%Vol	0.00	0.42	0.42	21.1	20.73	-1.75

CALIBRATION

Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (1/-5% FS)	Idel	Actual	Error (1/-5% FS)
WCOT-913 CO	0 - 100	ppm	0.00	0.00	0.00	80.5	80.5	0.00
WAT-9132 SO2	0 - 100	ppm	0.00	0.00	0.00	77.7	77.7	0.00
WAT-9131 NOx	0 - 100	ppm	0.00	0.00	0.00	82.1	82.1	0.00
WD2T-913 O2	0 - 25	%Vol	0.00	0.00	0.00	21.1	21.1	0.00

Note:

- Test standard gas and calibrate

Reported By: _____

Date: 18 / 10 / 2024



PTT Asahi Chemical Co.,Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

Area:

AN

Location:

NW\$

Tag Number:

WAT-9131, WAT-9132, WOOT-913, WO2T-913

Sampling Handling System

Item	Description	Set point	Actual	Remark
1	Z-Purge	Green	/	
2	Air Conditioner	Cool	/	
3	Instrument Air Supply	Supply	/	
4	Heated Probe Box			
4.1	Filter Probe	Clean	/	
4.2	Heated Probe	Heat 120 °C	120 °C	
4.3	BB System	Normal	/	
5	Heated Sample Line			
5.1	Heated line Temp.	Heat 120 °C	120 °C	
5.2	Sample line tube	Clean	/	
6	Sample Gas Cooler			
6.1	Cooler Temp	3.0 - 5.0 °C	3.0 °C	
6.2	Auto drain	Rotate	/	
6.3	Peristaltic pump hose	Normal	/	
7	Sample Pump	Run	/	
8	Coalescing Filter	Clean	/	
9	Moisture Controller	Normal	/	
10	Moisture Sensor	Normal	/	
11	Perma Pure Dryer	Clean	/	
12	NO2/NO Converter	Heat	/	
13	DFU Filter	Clean	/	
14	Air Pressure Regulator (PR1)	0.5 kg/cm2	0.5	
15	Air Pressure Regulator (PR2)	3.5 kg/cm3	3.5	
16	Cal. Gas Flow (FL-1)	0.0 L/h.	0.0	
17	Bypass Flow (FL-2)	OFF	/	Always off
18	CO/SO2/NOx Sample Flow (FL-3)	60 L/h.	60	
19	O2 Sample Flow (FL-4)	40 L/h.	40	
20	Air Pure Perma Pure (FL-5)	5 L/m.	5	
21	Calibration Switch Control	OFF Position	/	
22	N2 Gas Pressure in Cylinder	> 500 psi.	1850 / psi	
23	O2 Gas Pressure in Cylinder	> 500 psi.	1950 / psi	
24	Mix Gas Pressure in Cylinder	> 500 psi.	1950 / psi	
25	PLC Operation	Normal		

Note:

Reported By : _____

Date: 18/10/2024



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

OPACITY INFORMATION

Area:	AN	Location:	WWF
Tag Number:	W13PT-713		

ANALYZER INFORMATION

Brand:	Durag	Model:	D-R 290	S/N:	
Dust Range: (mg/m3)	0 - 100	b Factor:		O/P:	4-20 mA.

EQUIPMENT CHECK LIST

Item	Description	Set Point	Actual	Remark
1	Blower#1	Running	OK	
2	Filter Blower	Clean	Clean	
3	Fail Safe Shutter#A	Normal	OK	
4	Fail Safe Shutter#B	Normal	OK	
5	Display Unit (AZ)	Normal	OK	
6	Evaluation Unit (AW)	Normal	OK	

AUDIT FILTER INFORMATION

Item	Attenuation	Certificate Number	Expire Date
1	12.4%		
2	19.8%		
3	34.9%		

OPACITY CHECK & CALIBRATE

Item	Description	Set Point	Actual	
			Before	After
1	Dust Sample Reading (mg/m3)	-	mg/m3	mg/m3
2	Opacity Sample Reading (%)	-	%	%
2	Zero Check	0.0%	0.3 %	0.1 %
3	Span Check	71.0%	71.6 %	71.0 %
4	Window Check	<6.0%	0.3 %	0.2 %

AUDIT FILTER CHECK

Attenuation	Before			After			Remark
	Idel	Actual	Error (+/- 5%)	Idel	Actual	Error (+/- 5%)	
12.4%	12.4			12.4			
19.8%	19.8			19.8			
34.9%	24.9			24.9			

Note:

- Test zero/span opacity

Reported By: _____

Date: 18/10/2024



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

Area: MMA

Location: SAR

Tag Number: FAT-490 A/B/C

ANALYZER INFORMATION

1	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	ULTRAMAT 6
	S/N:		Parameter:	CO, NO, SO2		
2	Anal Type:	Gas Analyzer	Brand:	SIEMENS	Model:	OXYMAT 61
	S/N:		Parameter:	Oxygen (O2)		
3	Anal Type:		Brand:		Model:	
	S/N:		Parameter:			

STANDARD GAS INFORMATION

Gas Type	Std Conc.	Unit	Certificate Number	Cer. Date	Expire Date	CGA
CO	90.4	ppm	3056/23	01/11/2023	31/10/2026	660
NO	81.5	ppm	3056/23	01/11/2023	31/10/2026	660
SO2	79.3	ppm	3056/23	01/11/2023	31/10/2026	660
O2	21.2	%Vol	1006/24	27/03/2024	26/03/2028	590
N2	Balance	%				680

ASFOUND / VALIDATION

Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (+/- % FS)	Idel	Actual	Error (+/- % FS)
CO	0 - 100	ppm						
FAT-490A SO2	0 - 100	ppm	0.00	-2.12	-2.12	79.3	77.38	-2.42
FAT-490B NOx	0 - 100	ppm	0.00	-2.66	-2.66	81.5	79.84	-2.04
FAT-490C O2	0 - 25	%Vol	0.00	0.52	0.02	21.2	20.89	-1.68

CALIBRATION

Parameter	Range	Unit	Zero			Span		
			Idel	Actual	Error (+/- % FS)	Idel	Actual	Error (+/- % FS)
CO	0 - 100	ppm						
FAT-490A SO2	0 - 100	ppm	0.00	0.00	0.00	79.3	79.3	0.00
FAT-490B NOx	0 - 100	ppm	0.00	0.00	0.00	81.5	81.5	0.00
FAT-490C O2	0 - 25	%Vol	0.00	0.00	0.00	21.2	21.2	0.00

Note:

- Test standard gas and calibrate.

Reported By : _____

Date: 17 / 09 / 2024



PTT Asahi Chemical Co., Ltd.

TEST AND CALIBRATION REPORT
FOR
CONTINUOUS EMISSION MONITORING SYSTEM
(CEMS)

Mo. No.: _____

Page No.: _____

Area:

MMA

Location:

SAR

Tag Number:

FAT-490 A/B/C

Sampling Handling System

Item	Description	Set point	Actual	Remark
1	Z-Purge	Green	/	
2	Air Conditioner	Cool	/	
3	Instrument Air Supply	Supply	/	
4	Heated Probe Box			
4.1	Filter Probe	Clean	/	
4.2	Heated Probe	Heat 120 °C	120 °C	
4.3	BB System	Normal	/	
5	Heated Sample Line			
5.1	Heated line Temp.	Heat 120 °C	120 °C	
5.2	Sample line tube	Clean	/	
6	Sample Gas Cooler			
6.1	Cooler Temp	3.0 - 5.0 °C	3.0 °C	
6.2	Auto drain	Rotate	/	
6.3	Peristaltic pump hose	Normal	/	
7	Sample Pump	Run	/	
8	Coalescing Filter	Clean	/	
9	Moisture Controller	Normal	/	
10	Moisture Sensor	Normal	/	
11	Perma Pure Dryer	Clean	/	
12	NO2/NO Converter	Heat	/	
13	DFU Filter	Clean	/	
14	Air Pressure Regulator (PR1)	0.5 kg/cm2	0.5	
15	Air Pressure Regulator (PR2)	3.5 kg/cm3	3.5	
16	Cal. Gas Flow (FL-1)	0.0 L/h.	0.0	
17	Bypass Flow (FL-2)	OFF	/	Always off
18	CO/SO2/NOx Sample Flow (FL-3)	60 L/h.	60	
19	O2 Sample Flow (FL-4)	40 L/h.	40	
20	Air Pure Perma Pure (FL-5)	5 L/m.	5	
21	Calibration Switch Control	OFF Position	/	
22	N2 Gas Pressure in Cylinder	> 500 psi.	1440 / Psi	
23	O2 Gas Pressure in Cylinder	> 500 psi.	1150 / Psi	
24	Mix Gas Pressure in Cylinder	> 500 psi.	1630 / Psi	
25	PLC Operation	Normal		

Note:

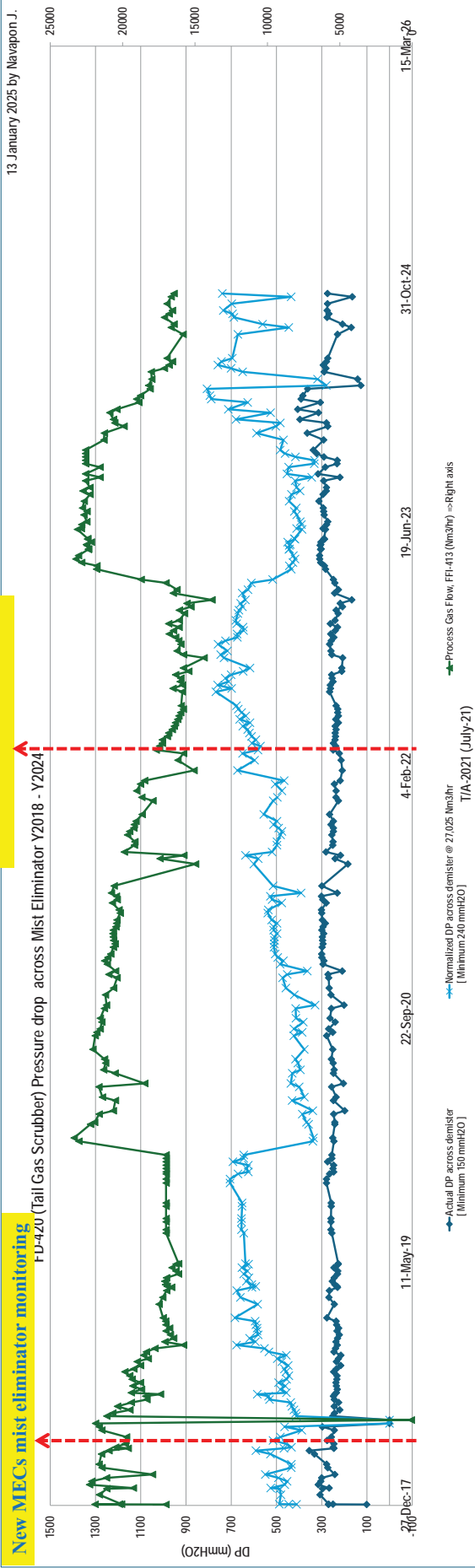
Reported By : _____

Date: 17/07/2024

ผลการตรวจสอบค่าความดันลดคร่อมตัวกรอง Demister (Mis Eliminator) ของระบบบำบัดมลพิษปล่อง SAR
ระหว่างเดือนกรกฎาคม-ธันวาคม 2567

Date & Time	Normalized DP across demister @ 27,025 Nm ³ /hr. [Minimum 240 mmH ₂ O]	FD-420 demister vendor
	FPX2-420B-FPX2-420A	
	mmH ₂ O	
30-ก.ค.-24 10:00	671	MECs
13-ส.ค.-24 14:00	445	MECs
20-ส.ค.-24 10:00	561	MECs
03-ก.ย.-24 10:00	688	MECs
10-ก.ย.-24 13:00	694	MECs
17-ก.ย.-24 13:00	735	MECs
01-ต.ค.-24 10:00	698	MECs
15-ต.ค.-24 15:00	435	MECs
22-ต.ค.-24 10:00	739	MECs

Remark : 1. Due to SAR shutdown in July 2024, The pressure drop was monitored once a month.
2. On plan Commercial Shutdown during November-December 2024



Replace New MECs mist eliminator
in T/A-2021 (July)

แผนการตรวจสอบและการดำเนินการ FD-420 Demister

เนื่องด้วยแนวโน้มของผล TSP จากการตรวจวัดคุณภาพอากาศประกอบในปล่อง SAR ในวันที่ 17 พฤษภาคม 2567 ที่มีค่าเพิ่มขึ้น แต่ยังคงผ่านเกณฑ์และอยู่ภายใต้เกณฑ์มาตรฐานของ EIA ทางบริษัท พีทีที อาซาฮี เคมิคอล จำกัด (PTTAC) จึงมีมาตรการเฝ้าระวังและวางแผนการตรวจสอบ FD-420 demister ในวันที่ 21 มิถุนายน 2567 เพื่อตรวจสอบประสิทธิภาพและความผิดปกติที่อาจเกิดขึ้นกับ FD-420 demister

ภายหลังการตรวจสอบ FD-420 demister ในวันที่ 21 มิถุนายน 2567 พบว่ามี FD-420 demister จำนวน 12 ชุด จากทั้งหมด 16 ชุด เริ่มมีความผิดปกติ แต่ยังสามารถใช้งานได้ ซึ่งทางบริษัทก็ไม่ได้มีนัยสนใจต่อผลลัพธ์ของการตรวจสอบดังกล่าว โดยให้หน่วยงาน EM/MT ภายใต้บริษัท พีทีที อาซาฮี เคมิคอล จำกัด (PTTAC) ดำเนินการแผนการสั่งซื้อ FD-420 demister ใหม่

แต่เนื่องจากการประกาศหยุดเดินเครื่องจักรเพื่อการพาณิชย์เป็นการชั่วคราว (Commercial Shutdown) และยังไม่มีการกำหนดกลับมาเดินเครื่องจักรที่แน่ชัดของทางบริษัทในช่วงเดือน สิงหาคมที่ผ่านมา จึงมีการหยุดการดำเนินการแผนการสั่งซื้อ FD-420 demister ใหม่ เป็นการชั่วคราว แต่ทางบริษัทเองก็ไม่ได้มีนัยสนใจ และยังมีมาตรการเฝ้าระวังและแผนการตรวจสอบคุณภาพอากาศที่ถูกปล่อยผ่านปล่อง SAR โดยมีการดำเนินการตามแผนการตรวจวัดคุณภาพอากาศประกอบในปล่อง SAR ในวันที่ 4 ตุลาคม 2567 โดยผลลัพธ์ที่ได้จากตรวจวัดคุณภาพอากาศนั้นยังผ่านเกณฑ์และอยู่ภายใต้เกณฑ์มาตรฐานของ EIA

โดยในช่วงของการดำเนินการกระบวนการโรงงาน SAR นั้นทางบริษัทก็จะยังคงปฏิบัติตามมาตรการเฝ้าระวังอย่างต่อเนื่อง และเมื่อใดที่ทางบริษัทมีประกาศกำหนดกลับมาเดินเครื่องจักรที่แน่ชัด ทางบริษัทจะดำเนินการแผนการสั่งซื้อและวางแผนการติดตั้ง FD-420 demister ใหม่อีกครั้ง ซึ่งสามารถตรวจสอบแผนงานการดำเนินการดำเนินงานของ FD-420 Demister ดังแสดงในตาราง

ตาราง 1 : แผนการตรวจสอบและการดำเนินการ FD-420 Demister

แผนงานการดำเนินงานของ FD-420 Demister	หน่วยงาน	ระยะเวลา	2567												2568												หมายเหตุ																
			ม.ย.				ก.ค.				ส.ค.				ก.ย.				ต.ค.				พ.ย.					ธ.ค.				ม.ค.				ก.พ.				มี.ค.			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		1	2	3	4	1	2	3	4								
1. การตรวจสอบ FD-420 demister	MMA	21 มิถุนายน 2567 [SAR shutdown : 18 มิ.ย. - 15 ก.ค. 2567]																																									
2. แผนการสั่งซื้อ FD-420 demister ใหม่ (ดำเนินการ PR/PO)	EN/MT	ก.ค. - ส.ค. 2567																																		หยุดการดำเนินการ PR/POชั่วคราว เนื่องจาก แผนหยุดเดินเครื่องจักรเพื่อการพาณิชย์เป็น การชั่วคราวและยังไม่มีกำหนดกลับมาเดิน เครื่องจักรที่แน่ชัด							
3. ดำเนินการตามแผนการตรวจวัดคุณภาพอากาศ ประจำรอบในบ่อดึง SAR	SS และ บุคคลที่สาม (3rd party)	4 ต.ค. 2567																																		ผลการตรวจสอบการตรวจวัดคุณภาพอากาศ ประจำรอบในบ่อดึง SAR ณ วันที่ 4 ต.ค. 2567 ผ่านเกณฑ์มาตรฐาน EIA							
4. หยุดกระบวนการผลิตโรงงาน SAR (ยังไม่มีกำหนดการเริ่มกระบวนการผลิตใหม่)	MMA	มี.ค. 2568																																									
5. ดำเนินการแผนการสั่งซื้อ FD-420 demister ใหม่ (ดำเนินการ PR/PO และวางแผนการติดตั้งFD-420 demister ใหม่)	EN/MT	หลังจากมีการประกาศ กำหนดกลับมาเดิน เครื่องจักรที่แน่ชัด																																									

หยุดการดำเนินการ PR/PO ชั่วคราว เนื่องจากแผนหยุดเดินเครื่องจักรเพื่อการพาณิชย์เป็นการชั่วคราวและยังไม่กำหนดกลับมามีเดินเครื่องจักรที่แน็ต

ผลการตรวจสอบการตรวจวัดคุณภาพอากาศ ประจำรอบในบ่อดึง SAR ณ วันที่ 4 ต.ค. 2567 ผ่านเกณฑ์มาตรฐาน EIA