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ภาคผนวก

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ภาคผนวก ก

หนังสือรับรองผลการตรวจวิเคราะห์

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ภาคผนวก ก1

ผลการตรวจวัดคุณภาพอากาศในบรรยากาศโดยทั่วไป

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## Report No.

: 2022-5003471 / 001-1 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sriprorn

## ADDRESS

: Padsaeng Industrial Estate, 1 Padsaeng Rd., Map Ta Phut, Rayong 21150

Tel. 038-684-816

Fax. 038-684-821

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : January 5-6, 2022  
SAMPLING LOCATION : Fence Line (North) SAMPLING BY : Rawlin Sangienngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	1. Acetaldehyde	5.24	9.45	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.83	2.85	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	2.84	9.87	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7270 and Regulator No.5805.

Source : - Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.  
Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 128, Special Part 13D, dated January 27, B.E. 2552 (2009).



Technical Manager

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## Report No.

: 2022-5003471 / 001-3 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : January 5-6, 2022  
SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawlin Sangienngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	1. Acetaldehyde	5.96	10.75	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	1.16	3.71	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	0.20	0.81	48
	13. Dichloromethane	11.00	38.24	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7097 and Regulator No.2243.

Source : - Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.  
Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 128, Special Part 13D, dated January 27, B.E. 2552 (2009).



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Report No.

: 2022-5003471 / 001-4 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Siriporn

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

SAMPLING LOCATION : Wat Nong Faeb School

SAMPLING DATE : January 5-6, 2022

SAMPLING BY : Rawin Sanglemgarn

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	1. Acetaldehyde	5.36	9.67	880
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.64	2.04	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2 Dichloroethane	<0.05	<0.38	370
	11. 1,4 Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	11.36	39.49	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7105 and Regulator No.5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

Technical Manager

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Report No.

: 2022-5003471 / 001-5 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

SAMPLING LOCATION : Fence Line (North)

SAMPLING DATE : January 5-6, 2022

SAMPLING BY : Rawin Sanglemgarn

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	Dichloromethane (Methylene Chloride)	2.84	9.87	210

Remarks : - Canister Tank No.7270 and Regulator No.5805.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

Technical Manager

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## Report No.

: 2022-5003471 / 001-7 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : January 5-6, 2022

SAMPLING LOCATION

: Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	11.00	38.24	210

Remarks : - Canister Tank No.7097 and Regulator No.2243.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

## Source :

<sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

TY/RS/MT/MTMT

Technical Manager



## Report No.

: 2022-5003471 / 001-8 (Page 1 of 1)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : January 5-6, 2022

SAMPLING LOCATION

: Wat Nong Faeh School SAMPLING BY : Jitthep Mee-nguen

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeh School	Dichloromethane (Methylene Chloride)	11.36	39.49	210

Remarks : - Canister Tank No.7105 and Regulator No.5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

<sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

TY/RS/MT/MTMT



Technical Manager





## Report No.

: 2022-5003471 / 002-1 (Page 1 of 3)

Issued date : January 21, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION : Fence Line (North Wind)

MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
09:00-10:00	NNE	1.8
10:00-11:00	NE	1.8
11:00-12:00	NNE	1.3
12:00-13:00	NNE	1.8
13:00-14:00	WSW	1.3
14:00-15:00	WSW	0.9
15:00-16:00	SW	1.8
16:00-17:00	W	0.9
17:00-18:00	NE	0.9
18:00-19:00	SE	1.3
19:00-20:00	SE	0.9
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	NNE	0.9
00:00-01:00	NE	1.3
01:00-02:00	NNE	1.3
02:00-03:00	NE	1.8
03:00-04:00	N	1.8
04:00-05:00	N	1.8
05:00-06:00	NNE	2.2
06:00-07:00	N	2.2
07:00-08:00	N	2.2
08:00-09:00	NNE	2.2

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TYRS/MT/MTM



Technical Manager

## Report No.

: 2022-5003471 / 002-1 (Page 2 of 3)

Issued date : January 21, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION : Fence Line (North Wind)

MEASURED BY : Rawin Sanglenngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	8.33	8.33	-	-
NNE	4.17	16.67	8.33	-	-
NE	4.17	12.50	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	4.17	4.17	-	-	-
SSE	-	-	-	-	-
S	-	-	-	-	-
SSW	-	-	-	-	-
SW	-	4.17	-	-	-
WSW	4.17	4.17	-	-	-
W	4.17	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-

12.50

TYRS/MT/MTM



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## Report No.

: 2022-5003471 / 002-1 (Page 3 of 3)

Issued date : January 21, 2022

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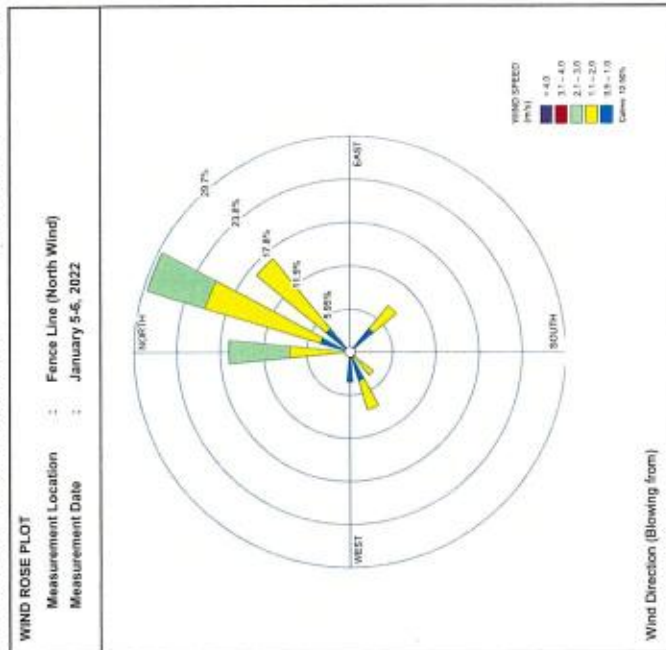
## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION : Fence Line (North Wind)

MEASURED BY : Rawin Sanglemngam



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## Report No.

: 2022-5003471 / 002-3 (Page 1 of 3)

Issued date : January 21, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
14:00-15:00	SSW	2.7
15:00-16:00	SSW	1.8
16:00-17:00	WNW	1.3
17:00-18:00	WNW	0.9
18:00-19:00	-	Calm
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	-	Calm
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	-	Calm
08:00-09:00	N	0.9
09:00-10:00	NE	1.8
10:00-11:00	NNE	2.2
11:00-12:00	N	2.7
12:00-13:00	N	2.7
13:00-14:00	N	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TY/RSMT/MTM



Technical Manager

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## Report No.

: 2022-5003471 / 002-3 (Page 2 of 3)

Issued date : January 21, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	4.17	4.17	8.33	-	-
NNE	-	-	4.17	-	-
NE	-	4.17	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	-	-	-	-
SSW	-	4.17	4.17	-	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	4.17	4.17	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-
58.33					-

TYRS/MT/MTM



Technical Manager



## Report No.

: 2022-5003471 / 002-3 (Page 3 of 3)

Issued date : January 21, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sriprom

## ADDRESS

: Paddaeng Industrial Estate, 1 Paddaeng Rd., Map Ta Phut, Rayong 21150

Tel. 038-684-816

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E-mail : Sommai.Srip@th.ipcc-ipac.com

## Analysis Report

SAMPLE DESIGNATED AS

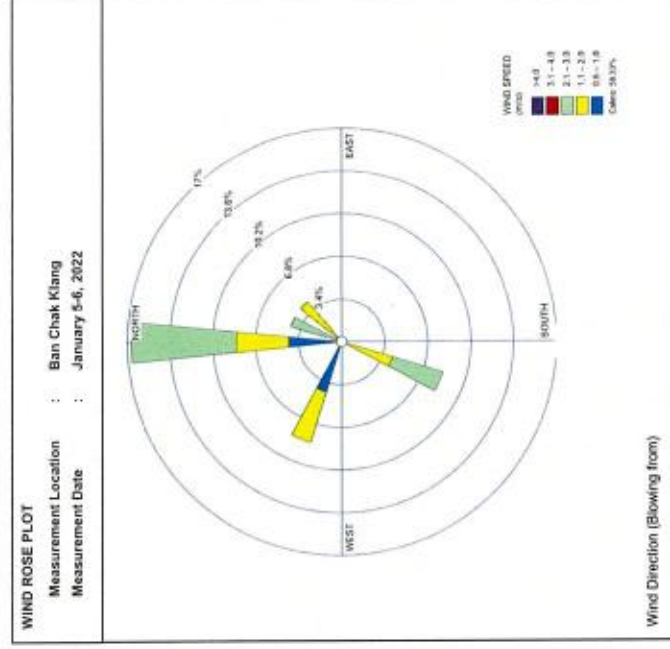
: Ambient Air Quality

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglemngam



Technical Manager



## Report No.

: 2022-5003471 / 002-4 (Page 1 of 3)

Issued date : January 21, 2022

CLIENT  
CONTACT  
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E-mail : Sommai.Srip@th.ipcc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab School  
MEASUREMENT DATE : January 5-6, 2022  
MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	S	1.3
11:00-12:00	SSW	2.2
12:00-13:00	SW	2.7
13:00-14:00	SW	2.2
14:00-15:00	SW	2.7
15:00-16:00	SW	2.2
16:00-17:00	SW	1.8
17:00-18:00	W	0.9
18:00-19:00	-	Calm
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	N	0.9
05:00-06:00	NE	0.9
06:00-07:00	-	Calm
07:00-08:00	-	Calm
08:00-09:00	NNE	1.3
09:00-10:00	ENE	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TYRS/MT/MTM



Technical Manager

## Report No.

: 2022-5003471 / 002-4 (Page 2 of 3)

Issued date : January 21, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab School  
MEASUREMENT DATE : January 5-6, 2022  
MEASURED BY : Rawin Sanglemngam

Wind Speed	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
Wind Direction					
N	4.17	-	-	-	-
NNE	-	4.17	-	-	-
NE	4.17	-	-	-	-
ENE	-	4.17	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	-	-	-
SSW	-	-	4.17	-	-
SW	-	4.17	16.67	-	-
WSW	-	-	-	-	-
W	4.17	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-



Technical Manager

TYRS/MT/MTM



## Report No.

: 2022-5003471 / 002-4 (Page 3 of 3)

Issued date : January 21, 2022

CLIENT  
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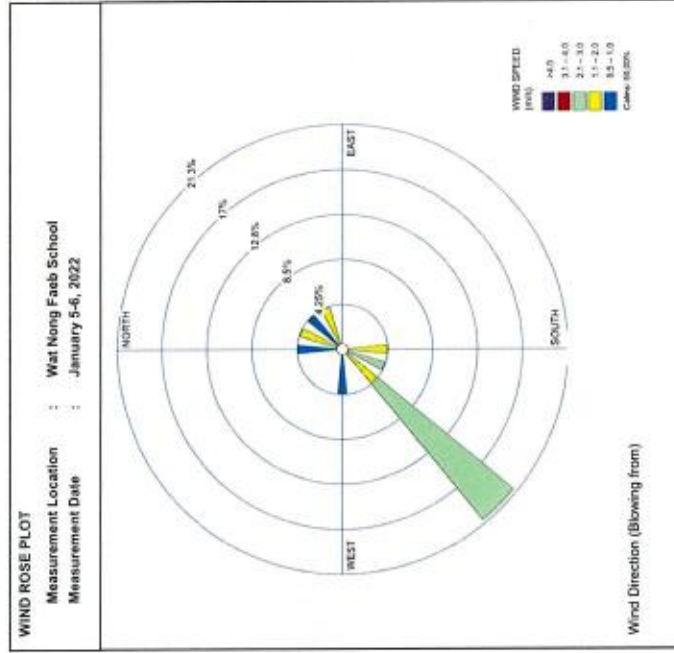
## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)

MEASUREMENT DATE : January 5-6, 2022

MEASUREMENT LOCATION : Wat Nong Faeb School

MEASURED BY : Rawin Sanglenngam



Technical Manager



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## Report No.

: 2022-5003643 / 001-1 (Page 1 of 1)

Issued date : February 14, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

SAMPLING DATE : February 1-2, 2022

SAMPLING LOCATION : Fence Line (North)

SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	1. Acetaldehyde	2.32	4.18	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.12	0.38	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	10.36	36.02	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4-Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7097 and Regulator No.5803.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : 1) Notification of the Pollution Control Department, subjected The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period, dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

Technical Manager



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Report No.

: 2022-5003643 / 001-3 (Page 1 of 1)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : February 1-2, 2022

SAMPLING LOCATION

: Ban Chak Klang SAMPLING BY : Rawin Sanglerngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>1)</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Ban Chak Klang	1. Acetaldehyde	2.83	5.10	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.24	0.77	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	1.19	4.14	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 7105 and Regulator No. 5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 128, Special Part 13D, dated January 27, B.E. 2552 (2009).



Technical Manager

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Report No.

: 2022-5003643 / 001-4 (Page 1 of 1)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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: Khun Sommai Sriptom

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : February 1-2, 2022

SAMPLING LOCATION

: Wat Nong Faeb School SAMPLING BY : Rawin Sanglerngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>1)</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Wat Nong Faeb School	1. Acetaldehyde	5.73	10.34	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.16	0.51	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	0.24	0.83	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. H3989 and Regulator No. 5805.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 128, Special Part 13D, dated January 27, B.E. 2552 (2009).



Technical Manager

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Report No.

: 2022-5003643 / 001-5 (Page 1 of 1)

Issued date : February 14, 2022

CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : February 1-2, 2022

SAMPLING LOCATION

: Fence Line (North)

SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Fence Line (North)	Dichloromethane (Methylene Chloride)	10.36	36.02	210

Remarks : - Canister Tank No.7097 and Regulator No.5803.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source :<sup>v</sup> Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

TV/RSMT/MTMT

Technical Manager

Report No.

: 2022-5003643 / 001-7 (Page 1 of 1)

Issued date : February 14, 2022

CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : February 1-2, 2022

SAMPLING LOCATION

: Ban Chak Klang

SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	1.19	4.14	210

Remarks : - Canister Tank No.7105 and Regulator No.5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source :<sup>v</sup> Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

TV/RSMT/MTMT

Technical Manager



## Report No.

: 2022-5003643 / 001-8 (Page 1 of 1)

Issued date : February 14, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

MEASUREMENT DATE : February 1-2, 2022

SAMPLING LOCATION : Wat Nong Faeb School

SAMPLING BY : Jitthap Mae-nguen

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>iv</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	0.24	0.83	210

Remarks : \* Canister Tank No.H3989 and Regulator No.5805.

\* Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>iv</sup> Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

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Technical Manager

## Report No.

: 2022-5003643 / 002-1 (Page 1 of 3)

Issued date : February 14, 2022

CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : February 1-2, 2022

MEASUREMENT LOCATION : Fence Line (North Wind)

MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
09:00-10:00	S	2.2
10:00-11:00	S	2.2
11:00-12:00	S	2.2
12:00-13:00	S	2.2
13:00-14:00	S	2.7
14:00-15:00	SSW	2.2
15:00-16:00	S	2.2
16:00-17:00	SW	2.2
17:00-18:00	SSW	1.8
18:00-19:00	SSW	1.8
19:00-20:00	SW	2.2
20:00-21:00	SW	1.8
21:00-22:00	SW	1.3
22:00-23:00	SSW	1.3
23:00-00:00	SW	1.3
00:00-01:00	SW	1.3
01:00-02:00	SW	1.3
02:00-03:00	SSW	1.8
03:00-04:00	SW	1.3
04:00-05:00	SSW	0.9
05:00-06:00	SW	0.9
06:00-07:00	SW	0.9
07:00-08:00	-	Calm
08:00-09:00	SSW	0.9

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

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## Report No.

: 2022-5003643 / 001-8 (Page 1 of 1)

Issued date : February 14, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

MEASUREMENT DATE : February 1-2, 2022

SAMPLING LOCATION : Wat Nong Faeb School

SAMPLING BY : Jitthap Mae-nguen

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>iv</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	0.24	0.83	210

Remarks : \* Canister Tank No.H3989 and Regulator No.5805.

\* Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>iv</sup> Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

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## Report No.

: 2022-5003643 / 002-1 (Page 2 of 3)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Siripom

## ADDRESS

: Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150

Tel. 038-684-816

Fax. 038-684-821

E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : February 1-2, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglerngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	-	25.00	-	-
SSW	8.33	16.67	4.17	-	-
SW	8.33	25.00	8.33	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-
					4.17

Technical Manager



TYRS/MT/MTM

## Report No.

: 2022-5003643 / 002-1 (Page 3 of 3)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

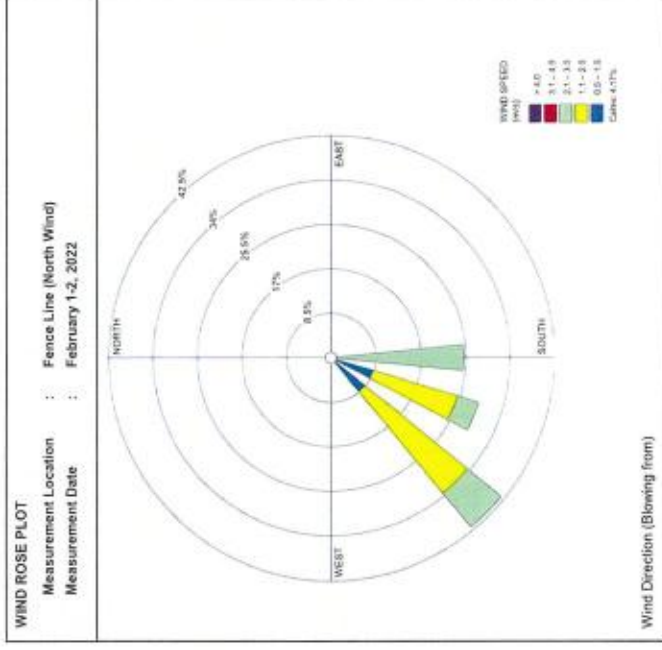
MEASUREMENT DATE : February 1-2, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglerngam



Technical Manager



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## Report No.

: 2022-5003643 / 002-3 (Page 1 of 3)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : February 1-2, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	SE	3.6
11:00-12:00	SE	4.0
12:00-13:00	S	3.6
13:00-14:00	S	3.6
14:00-15:00	S	4.0
15:00-16:00	SSW	4.0
16:00-17:00	SSW	3.6
17:00-18:00	SSW	3.6
18:00-19:00	SW	3.1
19:00-20:00	SSW	3.6
20:00-21:00	SSW	3.1
21:00-22:00	SSW	3.1
22:00-23:00	SSW	2.7
23:00-00:00	SW	3.1
00:00-01:00	SSW	2.7
01:00-02:00	SSW	2.7
02:00-03:00	SSW	3.1
03:00-04:00	SW	2.2
04:00-05:00	SW	0.9
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	NNW	0.9
08:00-09:00	-	Calm
09:00-10:00	NNW	0.9

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

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Technical Manager

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## Report No.

: 2022-5003643 / 002-3 (Page 2 of 3)

Issued date : February 14, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : February 1-2, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	8.33	-
SSE	-	-	-	-	-
S	-	-	-	12.50	-
SSW	-	-	12.50	29.17	-
SW	4.17	-	4.17	8.33	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	8.33	-	-	-	-
CALM	-	-	12.50	-	-



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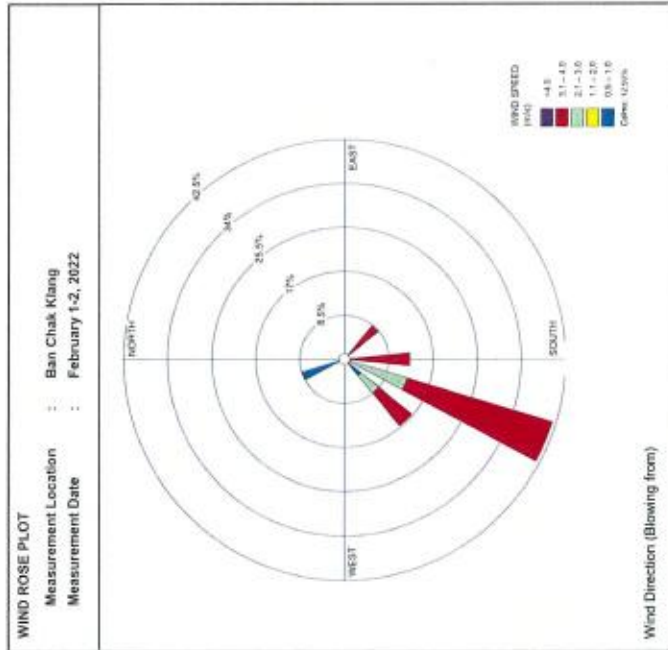
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Bang Chak Klang  
MEASUREMENT DATE : February 1-2, 2022  
MEASURED BY : Rawin Sanglingmangam

Technical Manager



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E-mail : Sommai.Srip@th.ipcc-ipac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab School  
MEASUREMENT DATE : February 1-2, 2022  
MEASURED BY : Rawin Sanglingmangam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	SE	2.7
11:00-12:00	SE	2.7
12:00-13:00	SE	2.7
13:00-14:00	SE	2.2
14:00-15:00	SE	2.2
15:00-16:00	SSW	2.2
16:00-17:00	SSW	2.2
17:00-18:00	SSW	2.2
18:00-19:00	SW	2.2
19:00-20:00	SSW	2.2
20:00-21:00	SSW	1.8
21:00-22:00	SSW	1.8
22:00-23:00	SW	1.8
23:00-00:00	SSW	1.8
00:00-01:00	SSW	1.3
01:00-02:00	SSW	1.8
02:00-03:00	SSW	1.8
03:00-04:00	SSW	1.3
04:00-05:00	SW	0.9
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	-	Calm
08:00-09:00	-	Calm
09:00-10:00	SW	1.3

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

Technical Manager



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Report No.

: 2022-5003643 / 002-4 (Page 2 of 3)

Issued date : February 14, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Faeb School  
MEASUREMENT DATE : February 1-2, 2022  
MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	20.83	-	-
SSE	-	-	-	-	-
S	-	-	-	-	-
SSW	-	29.17	16.67	-	-
SW	4.17	8.33	4.17	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	16.67	-

Technical Manager



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Report No.

: 2022-5003643 / 002-4 (Page 3 of 3)

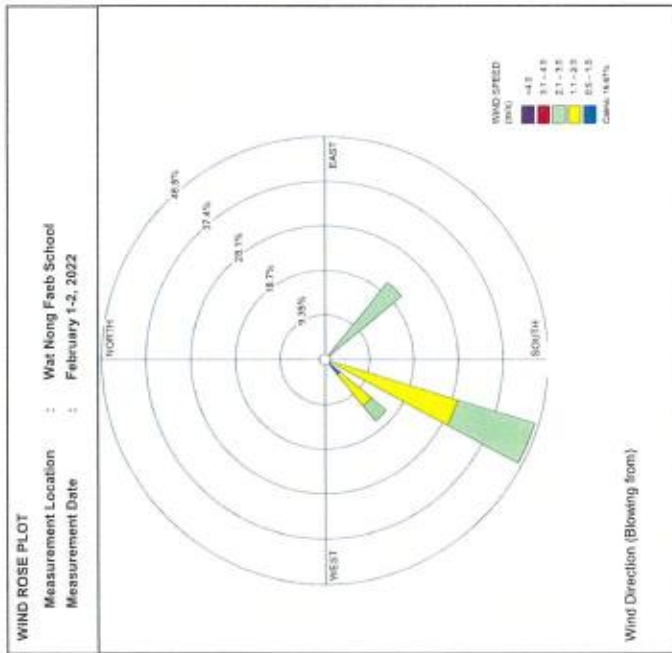
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E-mail : Sommai.Srip@th.ipcc-ipac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Faeb School  
MEASUREMENT DATE : February 1-2, 2022  
MEASURED BY : Rawin Sanglemngam



Technical Manager



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Report No.

: 2022-5003911 / 001-1 (Page 1 of 1)

Issued date : March 15, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS  
SAMPLING LOCATION

: Ambient Air Quality (VOCs by Canister)  
: Fence Line (North)

SAMPLING DATE : March 7-8, 2022  
SAMPLING BY : Rawin Sanglemgiam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	1. Acetaldehyde	3.12	5.63	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.20	0.64	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	2.56	8.90	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4-Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7106 and Regulator No.1283.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).



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Report No.

: 2022-5003911 / 001-3 (Page 1 of 1)

Issued date : March 15, 2022

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## Analysis Report

SAMPLE DESIGNATED AS  
SAMPLING LOCATION

: Ambient Air Quality (VOCs by Canister)  
: Ban Chak Klang

SAMPLING DATE : March 7-8, 2022  
SAMPLING BY : Rawin Sanglemgiam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	1. Acetaldehyde	3.00	5.41	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.16	0.51	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	0.32	1.11	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4-Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7103 and Regulator No.5802.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).



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Technical Manager





## Report No.

: 2022-5003911 / 001-4 (Page 1 of 1)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

SAMPLING DATE : March 7-8, 2022

SAMPLING LOCATION : Wat Nong Faeb School

SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	1. Acetaldehyde	1.67	3.01	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.40	1.28	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	0.05	0.17	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 24125 and Regulator No.5805.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : 1) Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).



Technical Manager

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## Report No.

: 2022-5003911 / 001-5 (Page 1 of 1)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sripram

## ADDRESS

: Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150

Tel. 038-684-816

Fax. 038-684-821

E-mail : Sommai.Srip@th.ipcc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister)

SAMPLING DATE : March 7-8, 2022

SAMPLING LOCATION : Fence Line (North)

SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	Dichloromethane (Methylene Chloride)	2.56	8.90	210

Remarks : - Canister Tank No.7106 and Regulator No.1283.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : 1) Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).



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## Report No.

: 2022-5003911 / 001-7 (Page 1 of 1)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : March 7-8, 2022

SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	0.32	1.11	210

Remarks : - Canister Tank No.7103 and Regulator No.5802.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

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Technical Manager



## Report No.

: 2022-5003911 / 001-8 (Page 1 of 1)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : March 7-8, 2022

SAMPLING LOCATION : Wat Nong Faeb School SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	0.05	0.17	210

Remarks : - Canister Tank No.24125 and Regulator No.5805.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

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Technical Manager



Issued date : March 15, 2022

: Padana Industrial Estate. 1 Padana

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**Abstract**

## Analysis Report

TESTED AS . . . Ambient Air Quality

(Mind Direction & Wind Speed)

LOCATION : Fence Line (North Wind)

BY : Ravin Sankaranarayanan

Wind Speed Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	8.33	-	-
NE	-	4.17	16.67	-	-
ENE	-	-	-	8.33	-
E	-	-	-	4.17	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	12.50	4.17	-	-
SSW	-	12.50	4.17	-	-
SW	12.50	8.33	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	4.17				

1. *Journal of Management Studies*, 1990, 27, 1, 1-14.

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4. The number of people who are not in the sample is 100 - 40 = 60.



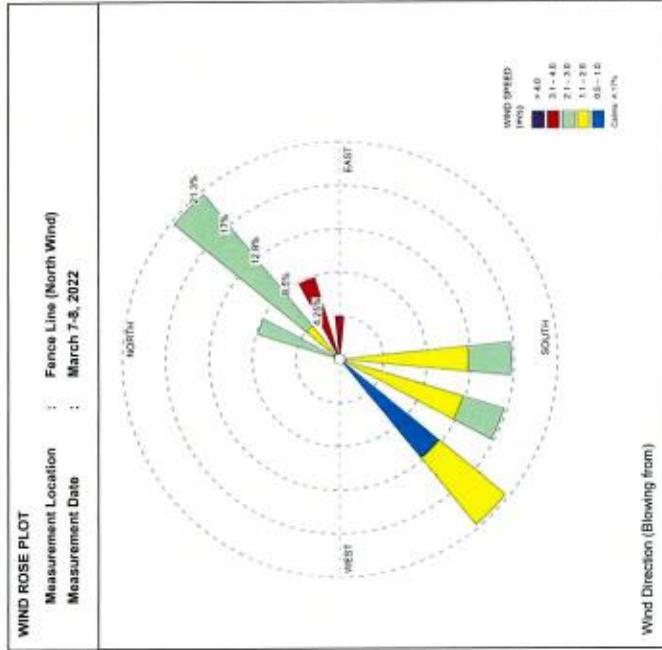
Report No.

: 2022-5003911 / 002-1 (Page 3 of 3)

Issued date : March 15, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Fence Line (North Wind)  
MEASUREMENT DATE : March 7-8, 2022  
MEASURED BY : Rawin Sanglemngam

## Report No.

: 2022-5003911 / 002-3 (Page 2 of 3)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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Fax. 038-684-821

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : March 7-8, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	8.33	8.33	-	-
NE	4.17	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	-	25.00	-
SSW	8.33	8.33	-	-	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	4.17	-	-	-
NNW	4.17	12.50	-	4.17	-
CALM	8.33				

Technical Manager



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## Report No.

: 2022-5003911 / 002-3 (Page 3 of 3)

Issued date : March 15, 2022

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: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

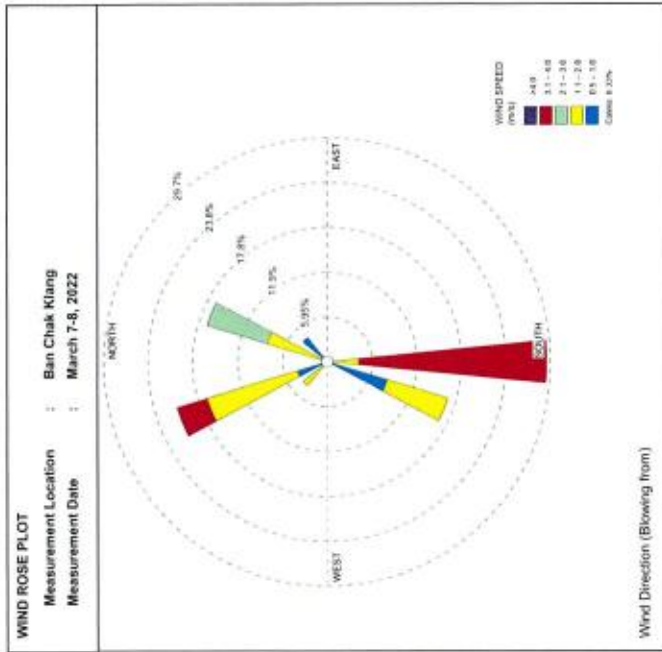
SAMPLE DESIGNATED AS : Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : March 7-8, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam



Technical Manager

TV/RS/MT/MTM

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## Report No.

: 2022-5003911 / 002-3 (Page 2 of 3)

Issued date : March 15, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : March 7-8, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	8.33	8.33	-	-
NE	4.17	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	-	25.00	-
SSW	8.33	8.33	-	-	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	4.17	-	-	-
NNW	4.17	12.50	-	4.17	-
CALM	8.33				

Technical Manager



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## Report No.

: 2022-5003911 / 002-4 (Page 1 of 3)

Issued date : March 15, 2022

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E-mail : Sommai.Sirp@th.ipcc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab SchoolMEASUREMENT DATE : March 7-8, 2022  
MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	SW	2.2
11:00-12:00	SW	2.2
12:00-13:00	SSW	2.2
13:00-14:00	SW	2.2
14:00-15:00	SW	2.2
15:00-16:00	SSW	2.2
16:00-17:00	SW	2.2
17:00-18:00	SW	2.2
18:00-19:00	SW	1.8
19:00-20:00	SW	0.9
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	NNE	2.7
02:00-03:00	NNE	2.2
03:00-04:00	NNE	2.2
04:00-05:00	N	2.2
05:00-06:00	NNE	1.3
06:00-07:00	NNE	1.3
07:00-08:00	NNE	1.3
08:00-09:00	NNE	1.3
09:00-10:00	NNE	0.9

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

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Technical Manager

## Report No.

: 2022-5003911 / 002-4 (Page 2 of 3)

Issued date : March 15, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab SchoolMEASUREMENT DATE : March 7-8, 2022  
MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	4.17	-	-
NNE	4.17	16.67	12.50	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	-	-	-	-
SSW	-	-	8.33	-	-
SW	4.17	4.17	25.00	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-
20.83					-



Technical Manager

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## Report No.

: 2022-5003911 / 002-4 (Page 3 of 3)

Issued date : March 15, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

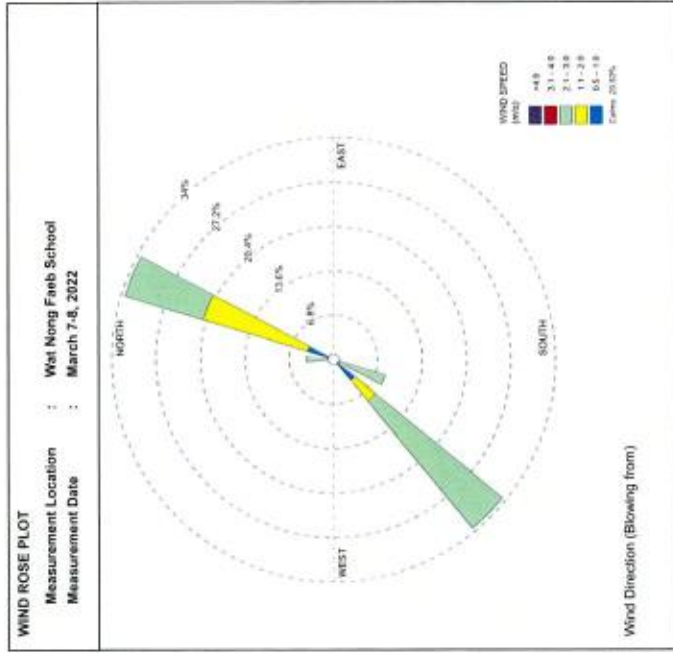
: Ambient Air Quality

MEASUREMENT DATE : March 7-8, 2022

MEASUREMENT LOCATION

: Wat Nong Faeb School

MEASURED BY : Rawin Sanglengngam



Report No.

: 2022-5004098 / 001-3 (Page 1 of 1)

Issued date : May 3, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : April 5-6, 2022  
SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawin Sanglermngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>u</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Ban Chak Klang	1. Acetaldehyde	3.76	6.78	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.56	1.79	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	3.04	10.57	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.23850 and Regulator No.5800.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 12, January 27, B.E. 2552 (2009).



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Technical Manager

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Report No.

: 2022-5004098 / 001-4 (Page 1 of 1)

Issued date : May 3, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : April 5-6, 2022  
SAMPLING LOCATION : Wat Nong Faeh School SAMPLING BY : Rawin Sanglermngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>u</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Wat Nong Faeh School	1. Acetaldehyde	3.88	7.00	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.72	2.30	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	5.96	20.72	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 10399 and Regulator No.5808.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).



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## Report No.

: 2022-5004098 / 001-5 (Page 1 of 1)

Issued date : May 3, 2022

CLIENT  
CONTACT  
ADDRESS: THAI POLYCARBONATE CO., LTD.  
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: Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150  
Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : April 5-6, 2022  
SAMPLING LOCATION : Fence Line (North) SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>vi</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	Dichloromethane (Methylene Chloride)	12.64	43.94	210

Remarks : - Canister Tank No.7100 and Regulator No.5807.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : " Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

TY/RSMT/MTM



Technical Manager



## Report No.

: 2022-5004098 / 001-7 (Page 1 of 1)

Issued date : May 3, 2022

CLIENT  
CONTACT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : April 5-6, 2022  
SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>vi</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	3.04	10.57	210

Remarks : - Canister Tank No.23850 and Regulator No.5800.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : " Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

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Technical Manager





## Report No.

: 2022-5004098 / 001-8 (Page 1 of 1)

Issued date : May 3, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : April 5-6, 2022  
SAMPLING LOCATION : Wat Nong Faeb School SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>1/</sup> ( $\mu\text{g}/\text{m}^3$ )
		ppb	$\mu\text{g}/\text{m}^3$	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	5.96	20.72	210

Remarks : - Canister Tank No.10399 and Regulator No.5808.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1/</sup> Notification of the Pollution Control Department, subjected "The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

TYRS/MT/MTM



Technical Manager



## Report No.

: 2022-5004098 / 002-1 (Page 1 of 3)

Issued date : May 3, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed) MEASUREMENT DATE : April 5-6, 2022  
MEASUREMENT LOCATION : Fence Line (North Wind) MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
09:00-10:00	NE	3.1
10:00-11:00	NE	3.1
11:00-12:00	NE	2.7
12:00-13:00	NE	2.7
13:00-14:00	S	2.7
14:00-15:00	S	2.2
15:00-16:00	SW	1.3
16:00-17:00	SSW	1.3
17:00-18:00	SSW	1.8
18:00-19:00	SSW	0.9
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	W	0.9
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	NE	1.8
05:00-06:00	NE	1.8
06:00-07:00	N	1.8
07:00-08:00	NE	0.9
08:00-09:00	NE	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TYRS/MT/MTM



Technical Manager



## Report No.

: 2022-5004098 / 002-1 (Page 2 of 3)

Issued date : May 3, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	4.17	-	-	-
NNE	-	-	-	-	-
NE	4.17	12.50	8.33	8.33	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	-	8.33	-	-
SSW	4.17	8.33	-	-	-
SW	-	4.17	-	-	-
WSW	-	-	-	-	-
W	4.17	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	33.33	-	-

## Report No.

: 2022-5004098 / 002-1 (Page 3 of 3)

Issued date : May 3, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

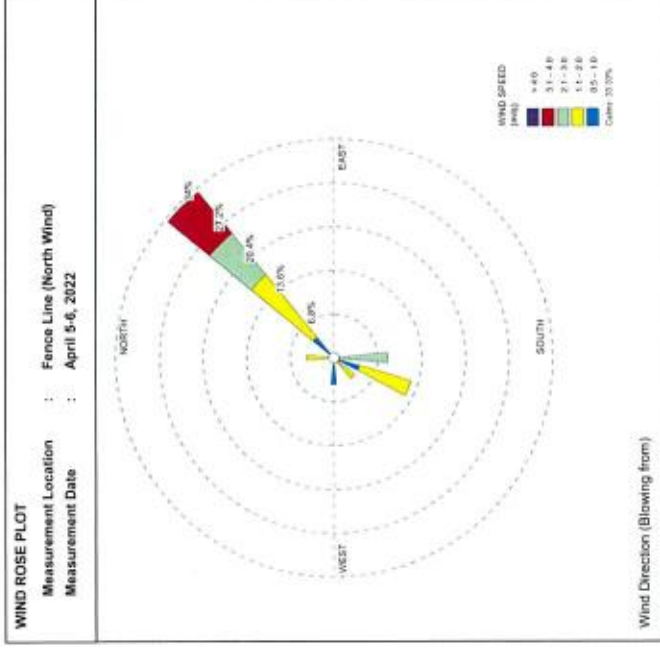
(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglemngam



## Report No.

: 2022-5004098 / 002-3 (Page 1 of 3)

Issued date : May 3, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	-	Calm
11:00-12:00	-	Calm
12:00-13:00	-	Calm
13:00-14:00	NE	1.8
14:00-15:00	NE	1.8
15:00-16:00	SSW	2.7
16:00-17:00	SSW	2.7
17:00-18:00	SSW	2.7
18:00-19:00	-	0.9
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	-	Calm
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	NNW	0.9
08:00-09:00	NE	0.9
09:00-10:00	NNE	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TV/RS/MT/MT/MT



Technical Manager



## Report No.

: 2022-5004098 / 002-3 (Page 2 of 3)

Issued date : May 3, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	4.17	-	-	-
NE	4.17	8.33	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	-	-	-	-
SSW	4.17	-	12.50	-	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	4.17	-	-	-	-
CALM	62.50				



Technical Manager





Report No.

: 2022-5004098 / 002-3 (Page 3 of 3)

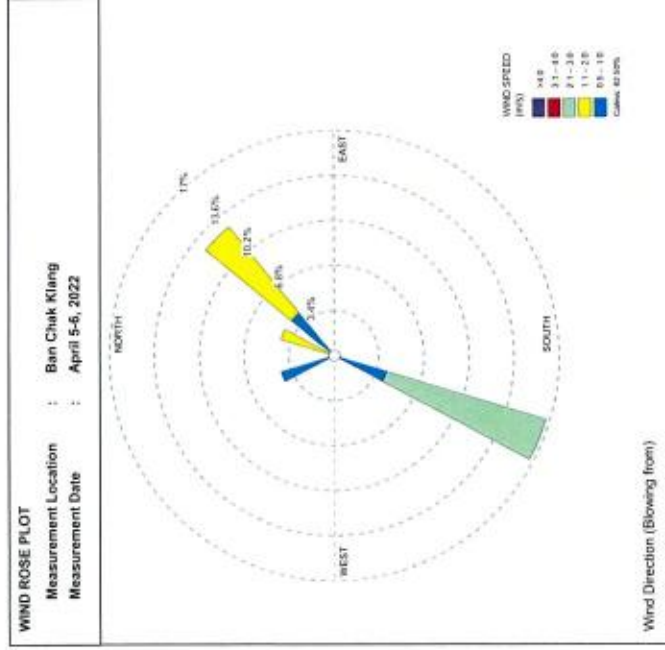
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Bang Chak Klang  
MEASURED BY : Rawin Sanglemngam



Technical Manager

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Report No.

: 2022-5004098 / 002-4 (Page 1 of 3)

Issued date : May 3, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab School  
MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	NE	1.3
11:00-12:00	-	Calm
12:00-13:00	-	Calm
13:00-14:00	-	Calm
14:00-15:00	-	Calm
15:00-16:00	S	2.7
16:00-17:00	SSW	1.8
17:00-18:00	SSW	1.8
18:00-19:00	-	Calm
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	-	Calm
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	-	Calm
08:00-09:00	SSW	0.9
09:00-10:00	NE	0.9

Measurement Method : - Wind speed and Wind direction recording meter/ ISO



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## Report No.

: 2022-5004098 / 002-4 (Page 2 of 3)

Issued date : May 3, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality  
(Wind Direction & Wind Speed)

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam

Wind Direction	Wind Speed	Percent of Wind Speed (%)				
		0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-	-
NNE	-	-	-	-	-	-
NE	4.17	-	4.17	-	-	-
ENE	-	-	-	-	-	-
E	-	-	-	-	-	-
ESE	-	-	-	-	-	-
SE	-	-	-	-	-	-
SSE	-	-	-	-	-	-
S	-	-	-	4.17	-	-
SSW	4.17	-	8.33	-	-	-
SW	-	-	-	-	-	-
WSW	-	-	-	-	-	-
W	-	-	-	-	-	-
WNW	-	-	-	-	-	-
NW	-	-	-	-	-	-
NNW	-	-	-	-	-	-
CALM	-	-	-	-	-	-
		75.00				

TYRS/MTMTM



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## Report No.

: 2022-5004098 / 002-4 (Page 3 of 3)

Issued date : May 3, 2022

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## Analysis Report

SAMPLE DESIGNATED AS

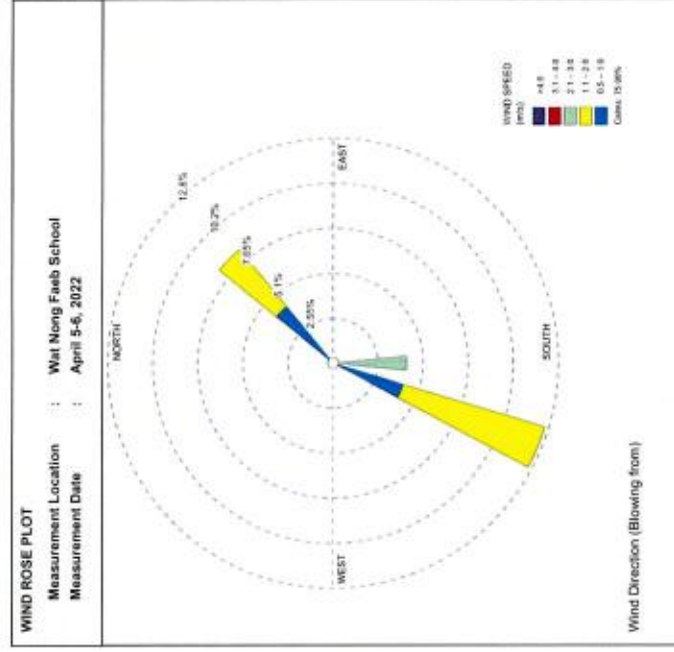
: Ambient Air Quality  
(Wind Direction & Wind Speed)

MEASUREMENT DATE : April 5-6, 2022

MEASUREMENT LOCATION

: Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam







Report No. : 2022-5004243 / 001-1 (Page 1 of 1) Issued date : May 26, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022  
SAMPLING LOCATION : Fence Line (North) SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	1. Acetaldehyde	4.20	7.58	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.33	1.05	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	24.87	86.46	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.7104 and Regulator No.13003.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period, dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).



TY/RS/MT/MT/MTM

Technical Manager

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Report No. : 2022-5004243 / 001-3 (Page 1 of 1) Issued date : May 26, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022  
SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	1. Acetaldehyde	6.52	11.76	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.12	0.38	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	9.48	32.96	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No.9249 and Regulator No.5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period, dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).



TY/RS/MT/MT/MTM

Technical Manager

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Report No.

: 2022-5004243 / 001-4 (Page 1 of 1)

Issued date : May 26, 2022

CLIENT  
CONTACT  
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: Khun Sommai Sriprom  
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E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS  
SAMPLING LOCATION: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022  
: Wat Nong Faeb School SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>u</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	1. Acetaldehyde	4.14	7.47	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	0.40	1.28	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	4.42	15.37	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 4874 and Regulator No.1283.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

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Report No.

: 2022-5004243 / 001-5 (Page 1 of 1)

Issued date : May 26, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS  
SAMPLING LOCATION: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022  
: Fence Line (North) SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>u</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	Dichloromethane (Methylene Chloride)	24.87	86.46	210

Remarks : - Canister Tank No.7104 and Regulator No.13003.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : - Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

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## Report No.

: 2022-5004243 / 001-6 (Page 1 of 1)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022

SAMPLING LOCATION

: Fence Line (South) SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (South)	Dichloromethane (Methylene Chloride)	14.13	49.12	210

Remarks : - Canister Tank No.10400 and Regulator No.5799.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

TYRS/MT/MTM



Technical Manager



## Report No.

: 2022-5004243 / 001-7 (Page 1 of 1)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : May 5-6, 2022

SAMPLING LOCATION

: Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>v</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	9.48	32.96	210

Remarks : - Canister Tank No.9249 and Regulator No.5804.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>v</sup> Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

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Technical Manager



## Report No.

: 2022-5004243 / 001-8 (Page 1 of 1)

Issued date : May 26, 2022

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## Analysis Report

SAMPLE DESIGNATED AS  
SAMPLING LOCATION: Ambient Air Quality (VOCs by Canister)  
: Wat Nong Faeb School

SAMPLING DATE : May 5-6, 2022

SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1/</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	4.42	15.37	210

Remarks : - Canister Tank No.4874 and Regulator No.1283.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1/</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

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Technical Manager



## Report No.

: 2022-5004243 / 001-1 (Page 1 of 3)

Issued date : May 26, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION : Fence Line (North Wind)

MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	NE	1.3
11:00-12:00	NE	0.9
12:00-13:00	E	1.3
13:00-14:00	SSW	2.2
14:00-15:00	SW	1.8
15:00-16:00	SSW	1.8
16:00-17:00	S	1.3
17:00-18:00	SSW	0.9
18:00-19:00	-	Calm
19:00-20:00	W	0.9
20:00-21:00	W	0.9
21:00-22:00	-	Calm
22:00-23:00	W	0.9
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	WNW	0.9
02:00-03:00	NE	0.9
03:00-04:00	NE	0.9
04:00-05:00	NE	1.8
05:00-06:00	NE	2.2
06:00-07:00	NE	1.8
07:00-08:00	NE	1.8
08:00-09:00	ENE	1.8
09:00-10:00	E	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TY/RS/MT/MTM



Technical Manager



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## Report No.

: 2022-5004243 / 001-1 (Page 2 of 3)

Issued date : May 26, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglerngnam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	12.50	16.67	4.17	-	-
ENE	-	4.17	-	-	-
E	-	8.33	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	-	-	-
SSW	4.17	4.17	4.17	-	-
SW	-	4.17	-	-	-
WSW	-	-	-	-	-
W	12.50	-	-	-	-
WNW	4.17	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-
					16.67

TVRS/MT/MTM



Technical Manager

## Report No.

: 2022-5004243 / 001-1 (Page 3 of 3)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

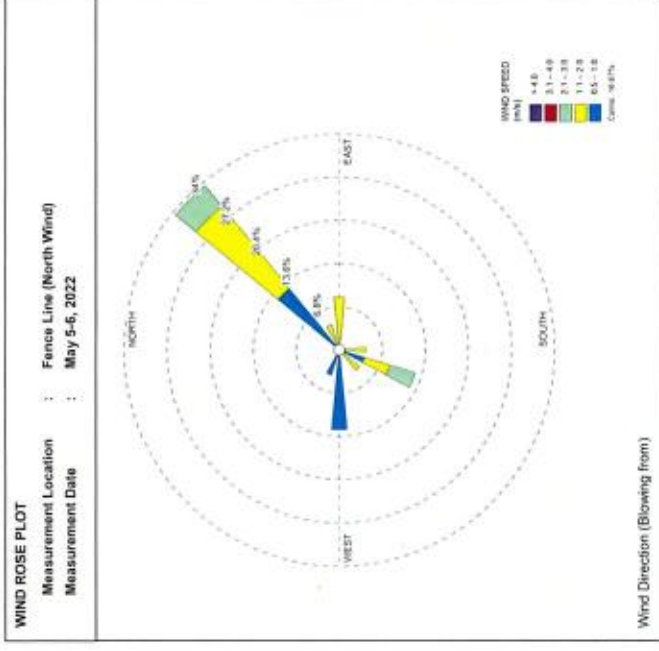
: Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglerngnam



TVRS/MT/MTM

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Technical Manager

Report No.

: 2022-5004243 / 002-2 (Page 1 of 3)

Issued date : May 26, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Fence Line (Down Wind)  
MEASURED BY : Rawin Sanglemngam

MEASUREMENT DATE : May 5-6, 2022

Time	Wind Direction	Wind Speed (m/s)
10:00-11:00	ESE	0.9
11:00-12:00	ESE	1.3
12:00-13:00	S	1.8
13:00-14:00	S	2.7
14:00-15:00	S	3.1
15:00-16:00	S	2.7
16:00-17:00	SW	1.8
17:00-18:00	SW	1.3
18:00-19:00	W	1.3
19:00-20:00	W	0.9
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	W	0.9
23:00-00:00	W	0.9
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	NE	1.3
05:00-06:00	NNE	0.9
06:00-07:00	NNW	1.3
07:00-08:00	NNE	1.3
08:00-09:00	ESE	1.8
09:00-10:00	ESE	2.2

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

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Report No.

: 2022-5004243 / 002-2 (Page 2 of 3)

Issued date : May 26, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Fence Line (Down Wind)  
MEASURED BY : Rawin Sanglemngam

MEASUREMENT DATE : May 5-6, 2022

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	4.17	4.17	-	-	-
NE	-	4.17	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	4.17	8.33	4.17	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	8.33	4.17	-
SSW	-	-	-	-	-
SW	-	8.33	-	-	-
WSW	-	-	-	-	-
W	12.50	4.17	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	4.16667	-	-	-
25.00					-

TYRS/MTM/MTM



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## Report No.

: 2022-5004243 / 002-2 (Page 3 of 3)

Issued date : May 26, 2022

## CLIENT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

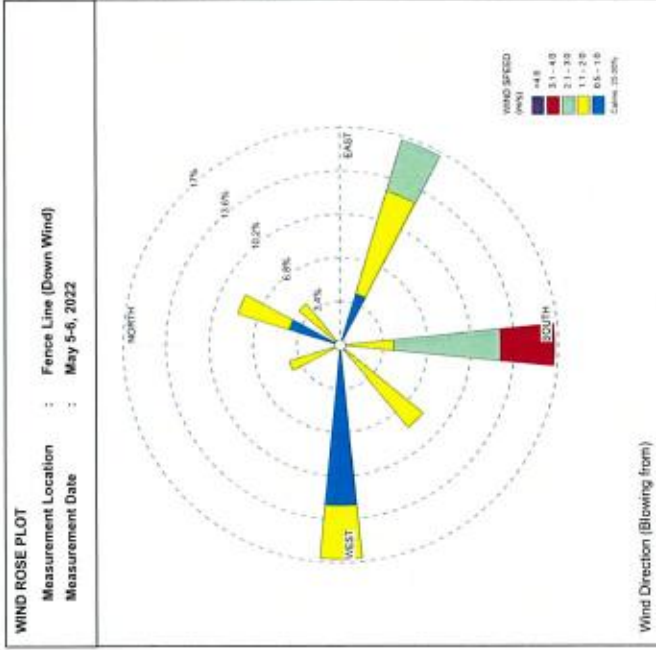
(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Fence Line (Down Wind)

MEASURED BY

: Rawin Sanglemngam



## Report No.

: 2022-5004243 / 002-3 (Page 1 of 3)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY

: Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
12:00-13:00	-	Calm
13:00-14:00	SW	1.3
14:00-15:00	S	2.7
15:00-16:00	SW	2.7
16:00-17:00	SW	1.8
17:00-18:00	-	Calm
18:00-19:00	-	Calm
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	-	Calm
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	NE	0.9
08:00-09:00	NE	1.3
09:00-10:00	ENE	1.8
10:00-11:00	SE	1.8
11:00-12:00	SSE	3.6

Measurement Method : - Wind speed and Wind direction recording meter/ ISO



TY/RS/MT/MT/MTM

Technical Manager



## Report No.

: 2022-5004243 / 002-3 (Page 2 of 3)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sripruom

## ADDRESS

: Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150

Tel. 038-684-816

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : May 5-6, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	4.17	4.17	-	-	-
ENE	-	4.17	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	4.17	-	-	-
SSE	-	-	-	4.17	-
S	-	-	4.17	-	-
SSW	-	-	-	-	-
SW	-	8.33	4.17	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-
			62.50		

TY/RS/MT/MT/MTM



Technical Manager

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## Report No.

: 2022-5004243 / 002-3 (Page 3 of 3)

Issued date : May 26, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

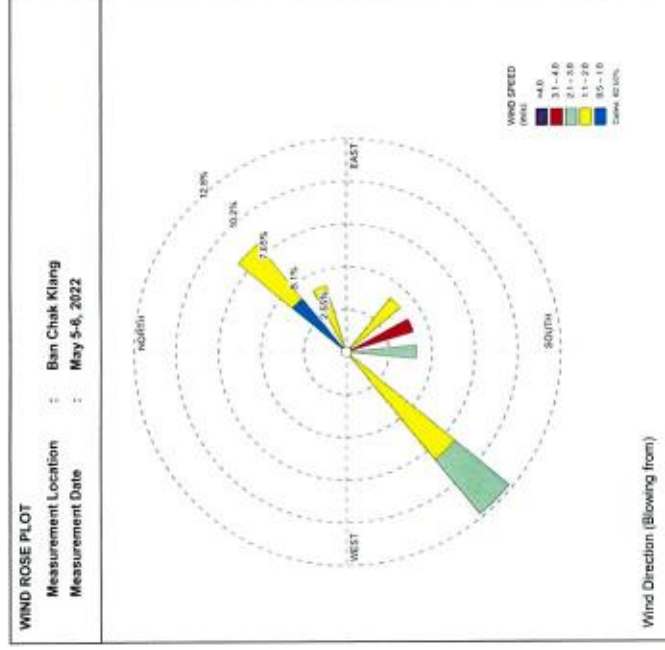
MEASUREMENT DATE : May 5-6, 2022

(Wind Direction &amp; Wind Speed)

MEASUREMENT LOCATION

: Bang Chak Klang

MEASURED BY : Rawin Sanglenngam



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## Report No.

: 2022-5004243 / 002-4 (Page 1 of 3)

Issued date : May 26, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : May 5-6, 2022

MEASUREMENT LOCATION : Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
11:00-12:00	W	0.9
12:00-13:00	SW	1.8
13:00-14:00	SSE	1.8
14:00-15:00	SE	2.2
15:00-16:00	SE	1.8
16:00-17:00	SSW	1.3
17:00-18:00	-	Calm
18:00-19:00	-	Calm
19:00-20:00	-	Calm
20:00-21:00	-	Calm
21:00-22:00	-	Calm
22:00-23:00	-	Calm
23:00-00:00	-	Calm
00:00-01:00	-	Calm
01:00-02:00	-	Calm
02:00-03:00	-	Calm
03:00-04:00	NNE	Calm
04:00-05:00	-	0.9
05:00-06:00	-	Calm
06:00-07:00	-	Calm
07:00-08:00	-	Calm
08:00-09:00	NNE	0.9
09:00-10:00	-	Calm
10:00-11:00	NNE	0.9

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TYRS/MT/MTM



Technical Manager

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## Report No.

: 2022-5004243 / 002-4 (Page 2 of 3)

Issued date : May 26, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality

(Wind Direction &amp; Wind Speed)

MEASUREMENT DATE : May 5-6, 2022

MEASUREMENT LOCATION : Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	12.50	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	4.17	4.17	-	-
SSE	-	4.17	-	-	-
S	-	-	-	-	-
SSW	-	4.17	-	-	-
SW	-	4.17	-	-	-
WSW	-	-	-	-	-
W	4.17	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-

62.50



TYRS/MT/MTM

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Report No. : 2022-5004243-1 / 001-4 (Page 1 of 1) Issued date : June 16, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : June 1-2, 2022  
SAMPLING LOCATION : Wat Nong Faeb School SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	1. Acetaldehyde	7.24	13.06	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	<0.05	<0.16	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	2.52	8.76	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 1085 and Regulator No. 1283.

Source : <sup>1)</sup> Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.  
Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

Technical Manager

TYRS/MT/MTM

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Report No. : 2022-5004243-1 / 001-3 (Page 1 of 1) Issued date : June 16, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
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E-mail : Sommai.Srip@th.ipcc-lpcc.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality (VOCs by Canister) SAMPLING DATE : June 1-2, 2022  
SAMPLING LOCATION : Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	1. Acetaldehyde	4.30	7.76	860
	2. Acrolein	<0.10	<0.23	0.55
	3. Acrylonitrile	<0.05	<0.11	10
	4. Benzene	<0.05	<0.16	7.6
	5. Benzyl Chloride	<0.05	<0.26	12
	6. 1,3-butadiene	<0.05	<0.11	5.3
	7. Bromomethane	<0.05	<0.19	190
	8. Carbon Tetrachloride	<0.05	<0.31	150
	9. Chloroform	<0.05	<0.24	57
	10. 1,2-Dibromoethane	<0.05	<0.38	370
	11. 1,4-Dichlorobenzene	<0.05	<0.30	1,100
	12. 1,2-dichloroethane (EDC)	<0.05	<0.20	48
	13. Dichloromethane	5.81	20.20	210
	14. 1,2-dichloropropane	<0.05	<0.23	82
	15. 1,4 Dioxane	<0.05	<0.18	860
	16. Tetrachloroethylene	<0.05	<0.34	400
	17. 1,1,2,2-Tetrachloroethane	<0.05	<0.34	83
	18. Trichloroethylene	<0.05	<0.27	130
	19. Vinyl Chloride	<0.05	<0.13	20

Remarks : - Canister Tank No. 7103 and Regulator No. 5803.

Source : <sup>1)</sup> Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.  
Notification of the Pollution Control Department, subjected 'The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

Technical Manager

TYRS/MT/MTM

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## Report No.

: 2022-5004243-1 / 001-5 (Page 1 of 1)

Issued date : June 16, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sriprom

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : June 1-2, 2022

SAMPLING LOCATION

: Fence Line (North) SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Fence Line (North)	Dichloromethane (Methylene Chloride)	13.32	46.31	210

Remarks : - Canister Tank No.23854 and Regulator No.5797.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

TYRS/MT/MTM



Technical Manager

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## Report No.

: 2022-5004243-1 / 001-7 (Page 1 of 1)

Issued date : June 16, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : June 1-2, 2022

SAMPLING LOCATION

: Ban Chak Klang SAMPLING BY : Rawin Sanglemngam

Sampling Location	Parameter	Value (24-hr)		Surveillant Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Ban Chak Klang	Dichloromethane (Methylene Chloride)	5.81	20.20	210

Remarks : - Canister Tank No.7103 and Regulator No.5903.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1)</sup> Notification of the Pollution Control Department, subjected "The surveillant values of volatile organic compounds (VOCs) in ambient air for 24 hours period", dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 130, dated January 27, B.E. 2552 (2009).

TYRS/MT/MTM



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## Report No.

: 2022-5004243-1 / 001-8 (Page 1 of 1)

Issued date : June 16, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

## SAMPLE DESIGNATED AS

: Ambient Air Quality (VOCs by Canister) SAMPLING DATE : June 1-2, 2022

## SAMPLING LOCATION

: Wat Nong Faeb School SAMPLING BY : Rawin Sanglenngam

Sampling Location	Parameter	Value (24-hr)		Surveillance Value <sup>1)</sup> (µg/m <sup>3</sup> )
		ppb	µg/m <sup>3</sup>	
Wat Nong Faeb School	Dichloromethane (Methylene Chloride)	2.52	8.76	210

Remarks : - Canister Tank No.1085 and Regulator No.1283.

- Sampling and analytical technique based on EPA TO-15 by Canister and GC-MS.

Source : <sup>1)</sup> Notification of the Pollution Control Department, subjected 'The surveillance values of volatile organic compounds (VOCs) in ambient air for 24 hours period', dated December 18, B.E. 2551 (2008), published in the Royal Government Gazette Vol. 126, Special Part 13D, dated January 27, B.E. 2552 (2009).

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## Report No.

: 2022-5004243-1 / 001-1 (Page 1 of 3)

Issued date : June 16, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

## SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : June 1-2, 2022

(Wind Direction &amp; Wind Speed)

## MEASUREMENT LOCATION

: Fence Line (North Wind)

MEASURED BY : Rawin Sanglenngam

Time	Wind Direction	Wind Speed (m/s)
13:00-14:00	SSW	1.8
14:00-15:00	SW	1.8
15:00-16:00	SSW	2.2
16:00-17:00	SW	1.8
17:00-18:00	SSW	1.8
18:00-19:00	SSW	1.3
19:00-20:00	SW	0.9
20:00-21:00	SSW	1.3
21:00-22:00	SSW	1.3
22:00-23:00	SSW	1.3
23:00-00:00	SSW	0.9
00:00-01:00	SSW	0.9
01:00-02:00	SSW	0.9
02:00-03:00	SW	0.9
03:00-04:00	SW	1.3
04:00-05:00	SSW	1.3
05:00-06:00	SSW	1.8
06:00-07:00	SSW	1.3
07:00-08:00	SSW	1.3
08:00-09:00	SSW	0.9
09:00-10:00	SSW	1.8
10:00-11:00	S	1.8
11:00-12:00	SW	1.8
12:00-13:00	SW	1.8

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TY/RS/MT/MTM



Technical Manager

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Report No.

: 2022-5004243-1 / 001-1 (Page 2 of 3)

Issued date : June 16, 2022

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Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommat.Srip@th.ipcc-lpcc.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Fence Line (North Wind)  
MEASURED BY : Rawin Sanglenngam

MEASUREMENT DATE : June 1-2, 2022

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	4.17	-	-	-
SSW	16.67	45.83	4.17	-	-
SW	8.33	20.83	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-

(Thapattin Yominsana)  
Technical Manager

TYRS/MTMMTM

Report No.

: 2022-5004243-1 / 001-1 (Page 3 of 3)

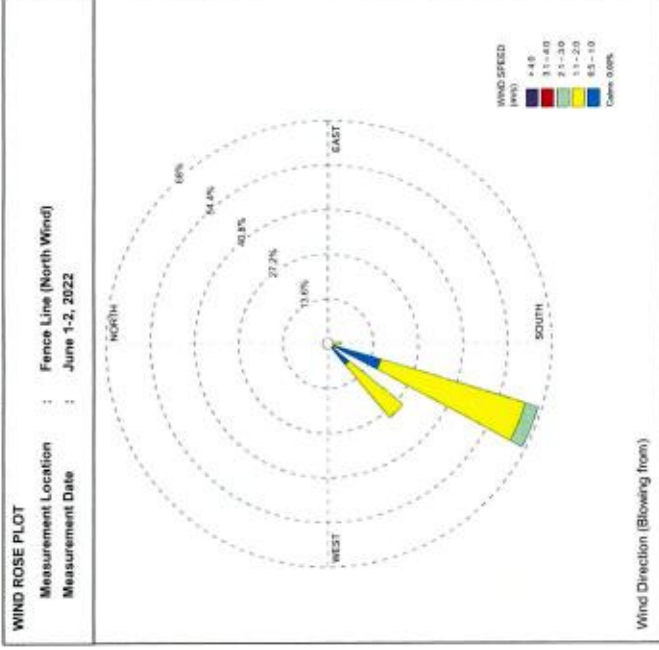
Issued date : June 16, 2022

CLIENT  
CONTACT  
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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Fence Line (North Wind)  
MEASURED BY : Rawin Sanglenngam

MEASUREMENT DATE : June 1-2, 2022



Technical Manager

TYRS/MTMMTM

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## Report No.

: 2022-5004243-1 / 002-3 (Page 1 of 3)

Issued date : June 16, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)

MEASUREMENT DATE : June 1-2, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
14:00-15:00	S	2.7
15:00-16:00	S	3.6
16:00-17:00	S	3.6
17:00-18:00	SSW	2.2
18:00-19:00	SSW	1.8
19:00-20:00	SSW	1.8
20:00-21:00	SSW	2.2
21:00-22:00	S	1.8
22:00-23:00	S	1.3
23:00-00:00	S	0.9
00:00-01:00	SSW	0.9
01:00-02:00	-	Calm
02:00-03:00	SSW	0.9
03:00-04:00	-	Calm
04:00-05:00	SSW	0.9
05:00-06:00	SSW	1.3
06:00-07:00	S	1.3
07:00-08:00	SSW	1.3
08:00-09:00	S	1.8
09:00-10:00	S	2.2
10:00-11:00	S	3.1
11:00-12:00	S	3.6
12:00-13:00	S	3.6
13:00-14:00	S	4.0

Measurement Method : - Wind speed and Wind direction recording meter/ ISO

TYIRS/MT/MTM



Technical Manager

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## Report No.

: 2022-5004243-1 / 002-3 (Page 2 of 3)

Issued date : June 16, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)

MEASUREMENT DATE : June 1-2, 2022

MEASUREMENT LOCATION : Bang Chak Klang

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	4.17	16.67	8.33	25.00	-
SSW	12.50	16.67	8.33	-	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNN	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	-	-

8.33



Technical Manager

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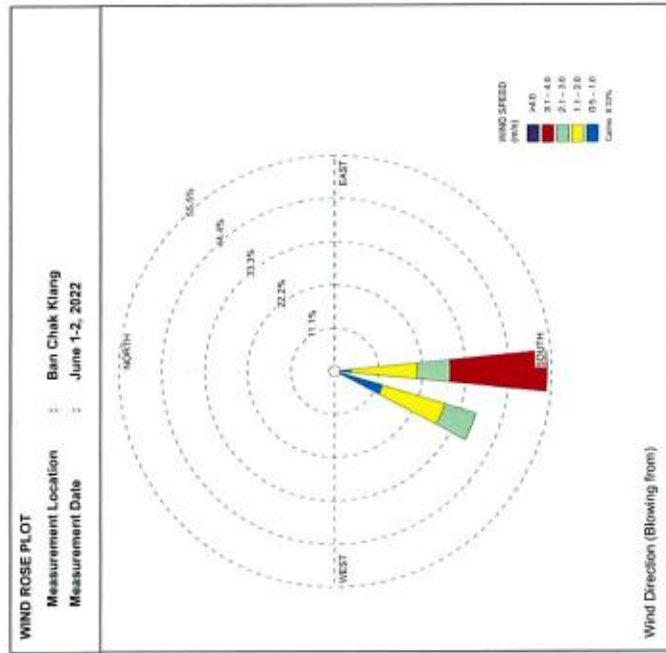
## Report No.

: 2022-5004243-1 / 002-3 (Page 3 of 3)

Issued date : June 16, 2022

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E-mail : Sommai.Srip@th.ipcc-ipac.com

## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Bang Chak Klang  
MEASUREMENT DATE : June 1-2, 2022  
MEASURED BY : Rawin Sanglemngam

Technical Manager

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## Report No.

: 2022-5004243-1 / 002-4 (Page 1 of 3)

Issued date : June 16, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Ambient Air Quality  
(Wind Direction & Wind Speed)  
MEASUREMENT LOCATION : Wat Nong Feab School  
MEASUREMENT DATE : June 1-2, 2022  
MEASURED BY : Rawin Sanglemngam

Time	Wind Direction	Wind Speed (m/s)
14:00-15:00	S	2.7
15:00-16:00	S	2.7
16:00-17:00	S	3.6
17:00-18:00	S	2.7
18:00-19:00	SSW	2.2
19:00-20:00	SSW	1.8
20:00-21:00	SSW	2.2
21:00-22:00	SSW	2.2
22:00-23:00	S	1.8
23:00-00:00	SSW	1.3
00:00-01:00	SSW	0.9
01:00-02:00	SSW	0.9
02:00-03:00	-	Calm
03:00-04:00	-	Calm
04:00-05:00	SSW	0.9
05:00-06:00	SSW	0.9
06:00-07:00	SSW	1.3
07:00-08:00	SSW	1.3
08:00-09:00	S	1.8
09:00-10:00	S	2.2
10:00-11:00	S	3.1
11:00-12:00	SSW	3.1
12:00-13:00	SSW	3.6
13:00-14:00	SSW	3.6

Measurement Method : - Wind speed and Wind direction recording meter/ ISO



Technical Manager

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Report No.

: 2022-5004243-1 / 002-4 (Page 2 of 3)

Issued date : June 16, 2022

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## Analysis Report

SAMPLE DESIGNATED AS

: Ambient Air Quality

MEASUREMENT DATE : June 1-2, 2022

MEASUREMENT LOCATION

: Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam

Wind Direction	Percent of Wind Speed (%)				
	0.5-1.0 m/s	1.1-2.0 m/s	2.1-3.0 m/s	3.1-4.0 m/s	>4.0 m/s
N	-	-	-	-	-
NNE	-	-	-	-	-
NE	-	-	-	-	-
ENE	-	-	-	-	-
E	-	-	-	-	-
ESE	-	-	-	-	-
SE	-	-	-	-	-
SSE	-	-	-	-	-
S	-	8.33	16.67	8.33	-
SSW	16.67	16.67	12.50	12.50	-
SW	-	-	-	-	-
WSW	-	-	-	-	-
W	-	-	-	-	-
WNW	-	-	-	-	-
NW	-	-	-	-	-
NNW	-	-	-	-	-
CALM	-	-	-	8.33	-

TV/RS/MT/MTM



Technical Manager

Report No.

: 2022-5004243-1 / 002-4 (Page 3 of 3)

Issued date : June 16, 2022

CLIENT

: THAI POLYCARBONATE CO., LTD.

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E-mail : Sommai.Srip@th.ipcc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS

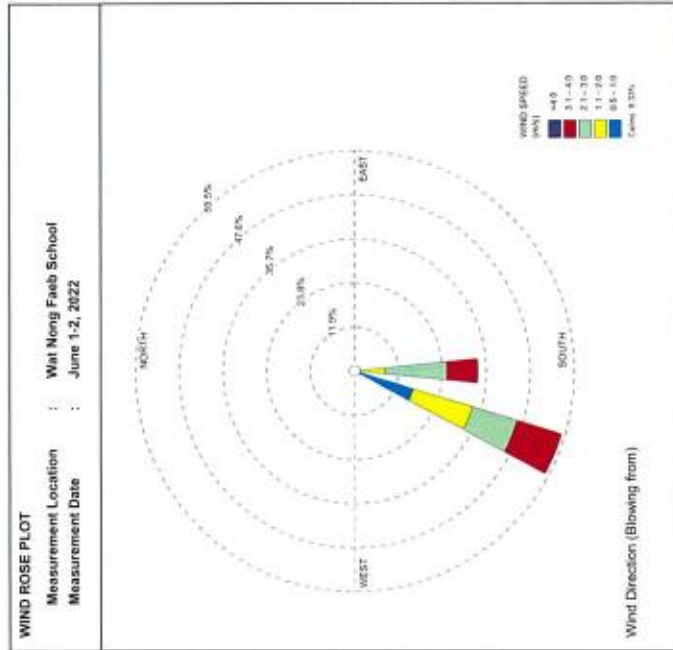
: Ambient Air Quality

MEASUREMENT DATE : June 1-2, 2022

MEASUREMENT LOCATION

: Wat Nong Feab School

MEASURED BY : Rawin Sanglemngam



Technical Manager

TV/RS/MT/MTM

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---

**ภาคผนวก ก2**

**ผลการตรวจวัดคุณภาพอากาศจากปล่องระบาย**

---

## Report No.

: 2022-5004172 / 002-1 (Page 1 of 1)

Issued date : May 18, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality  
SAMPLING LOCATION : MC Adsorber V-487, TPCC 1 Plant  
SAMPLING BY : Phatsakorn SoonthornwiphatSAMPLING DATE : April 27, 2022  
SAMPLING TIME : 09:00-09:05 hr.

Parameter	Unit	Value	EIA Criteria <sup>1)</sup>	Analytical Method
Stack Diameter	cm.	20	-	-
Stack Temperature	°C	63.0	-	-
Air Velocity	m/s	1.83	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm <sup>3</sup> /hr	162	-	
O <sub>2</sub>	%	20.80	-	U.S.EPA Method 3
CO <sub>2</sub>	%	0.00	-	
Methylene Chloride	at actual O <sub>2</sub> Emission Rate	mg/m <sup>3</sup> g/sec	556 0.097	U.S.EPA Method 18 Calculation

Remark: N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm-Hg, and dry basis.  
N.D. = Not Detected. Detection Limit of Methylene Chloride <1.82 mg/m<sup>3</sup> and emission rate <0.00008 g/s  
The emission air criteria according to EIA study of TPCC Expansion Project as approval letter Tor Sor 1009.9/6206 dated June 28, B.E 2555 (2012).

Source: [REDACTED]



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## Report No.

: 2022-5004172 / 002-2 (Page 1 of 1)

Issued date : May 18, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality  
SAMPLING LOCATION : HE Adsorber V-681, TPCC 1 Plant  
SAMPLING BY : Phatsakorn SoonthornwiphatSAMPLING DATE : April 27, 2022  
SAMPLING TIME : 10:20-10:25 hr.

Parameter	Unit	Value	EIA Criteria <sup>1)</sup>	Analytical Method
Stack Diameter	cm.	64	-	-
Stack Temperature	°C	76.9	-	-
Air Velocity	m/s	14.92	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm <sup>3</sup> /hr	13,286	-	
O <sub>2</sub>	%	20.80	-	U.S.EPA Method 3
CO <sub>2</sub>	%	0.00	-	
Heptane	at actual O <sub>2</sub> Emission Rate	mg/m <sup>3</sup> g/sec	N.D. N.D.	U.S.EPA Method 18 Calculation
Methylene Chloride	at actual O <sub>2</sub> Emission Rate	mg/m <sup>3</sup> g/sec	N.D. N.D.	U.S.EPA Method 18 Calculation

Remarks: N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm-Hg, and dry basis.  
N.D. = Not Detected. Detection Limit of Heptane <1.83 mg/m<sup>3</sup> and emission rate <0.0068 g/s  
Detection Limit of Methylene Chloride <1.83 mg/m<sup>3</sup> and emission rate <0.0068 g/s  
The emission air criteria according to EIA study of TPCC Expansion Project as approval letter Tor Sor 1009.9/6206 dated June 28, B.E 2555 (2012).

Source: [REDACTED]



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Technical Manager

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## Report No.

: 2022-5004172 / 002-3 (Page 1 of 1)

Issued date : May 18, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

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## Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality

SAMPLING DATE : April 27, 2022

SAMPLING LOCATION : HE Adsorber 2V-681, TPCC 1 Plant

SAMPLING TIME : 11.35-11.40 hr.

SAMPLING BY : Phatsakorn Soonthornwiphat

Parameter	Unit	Value	EIA Criteria <sup>ii</sup>	Analytical Method
Stack Diameter	cm.	64	-	-
Stack Temperature	°C	81.8	-	-
Air Velocity	m/s	14.37	-	-
Volumetric Flow Rate	Nm <sup>3</sup> /hr	12,544	-	U.S.EPA Method 2
O <sub>2</sub>	%	20.80	-	-
CO <sub>2</sub>	%	0.00	-	U.S.EPA Method 3
Heptane	at actual O <sub>2</sub>	N.D.	>350.5	U.S.EPA Method 18
	Emission Rate	N.D.	>2.127	Calculation
Methylene Chloride	at actual O <sub>2</sub>	N.D.	>229.9	U.S.EPA Method 18
	Emission Rate	N.D.	>1.395	Calculation

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.

- N.D. = Not Detected. Detection Limit of Heptane <1.83 mg/m<sup>3</sup> and emission rate <0.0064 g/s- Detection Limit of Methylene Chloride <1.83 mg/m<sup>3</sup> and emission rate <0.0064 g/s

Source : " The emission air criteria according to EIA study of TPCC Expansion Project as approval letter Tor Sor 1009.9/6206 dated June 28, B.E. 2555 (2012).

T/PS/MT/MT/MT



Technical Manager

## Report No.

: 2022-5004172 / 002-4 (Page 1 of 1)

Issued date : May 18, 2022

## CLIENT

: THAI POLYCARBONATE CO., LTD.

## CONTACT

: Khun Sommai Sriptom

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E-mail : Sommai.Srip@th.tpsc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality

SAMPLING DATE : April 28, 2022

SAMPLING LOCATION : MC Adsorber 3V-487, TPCC 2 Plant

SAMPLING TIME : 11.35-11.40 hr.

SAMPLING BY : Phatsakorn Soonthornwiphat

Parameter	Unit	Value	EIA Criteria <sup>ii</sup>	Analytical Method
Stack Diameter	cm.	26	-	-
Stack Temperature	°C	72.8	-	-
Air Velocity	m/s	2.62	-	-
Volumetric Flow Rate	Nm <sup>3</sup> /hr	384	-	U.S.EPA Method 2
O <sub>2</sub>	%	20.80	-	-
CO <sub>2</sub>	%	0.00	-	U.S.EPA Method 3
Methylene Chloride	at actual O <sub>2</sub>	N.D.	>1.029	U.S.EPA Method 18
	Emission Rate	N.D.	>0.110	Calculation

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.

- N.D. = Not Detected. Detection Limit of Methylene Chloride <1.83 mg/m<sup>3</sup> and emission rate <0.0019 g/s

Source : " The emission air criteria according to EIA study of TPCC Expansion Project as approval letter Tor Sor 1009.9/6206 dated June 28, B.E. 2555 (2012).

T/PS/MT/MT/MT



Technical Manager



**Report No.** : 2022-5004172 / 002-5 (Page 1 of 1) **Issued date** : May 18, 2022

**CLIENT** : THAI POLYCARBONATE CO., LTD.  
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E-mail : Sommai.Srip@th.lpcoc-lpac.com

**Analysis Report**

**SAMPLE DESIGNATED AS** : Emission Air Quality  
**SAMPLING LOCATION** : HE Adsorber 3V-881, TPCC 2 Plant  
**SAMPLING BY** : Phaisakorn Soonthornwiphat

**SAMPLING DATE** : April 28, 2022  
**SAMPLING TIME** : 09.35-09.40 hr.

Parameter	Unit	Value	EIA Criteria <sup>1)</sup>	Analytical Method
Stack Diameter	cm.	100	-	-
Stack Temperature	°C	79.2	-	-
Air Velocity	m/s	21.45	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm <sup>3</sup> /hr	46.367	-	U.S.EPA Method 3
O <sub>2</sub>	%	20.80	-	U.S.EPA Method 3
CO <sub>2</sub>	%	0.00	-	U.S.EPA Method 3
Heptane	at actual O <sub>2</sub>	N.D.	> 225	U.S.EPA Method 18
	Emission Rate	N.D.	> 4.750	Calculation
Methylene Chloride	at actual O <sub>2</sub>	N.D.	> 126.1	U.S.EPA Method 18
	Emission Rate	N.D.	> 2.349	Calculation

**Remark :** N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm Hg. and dry basis.  
N.D. = Not Detected, Detection Limit of Heptane <1.82 mg/m<sup>3</sup> and emission rate <0.0234 g/s  
Detection Limit of Methylene Chloride <1.82 mg/m<sup>3</sup> and emission rate <0.0234 g/s  
**Source :** The emission air criteria according to EIA study of TPCC Expansion Project as approval letter Tor Sor 1009.9/6205 dated June 28, B.E. 2555 (2012).

Technical Manager



TY/PS/INT/MTM

E 245203

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ภาคผนวก ก3

ผลการตรวจวัดระดับเสียงดังโดยทั่วไป

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**Report No. : 2022-5003980 / 003 (Page 1 of 1)**

**Issued date : April 27, 2022**

**CLIENT :** THAI POLYCARBONATE CO., LTD.  
**CONTACT :** Khun Sommai Sriprom  
**ADDRESS :** Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150  
 Tel. 038-684-816 Fax. 038-687-776  
 E-mail : Sommai.Srip@th.tppc-tpac.com

## Analysis Report

**SAMPLE DESIGNATED AS :** Ambient Noise Level  
**MEASUREMENT LOCATION :** North Fence of Project TPCC  
**CALIBRATOR DATA :** Model CR:515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
 Pre Cal : 93.8 dB(A), Post Cal : 93.7 dB(A)  
**SOUND LEVEL METER NO. :** Model CR:171B, Serial No.G078054  
**MEASUREMENT DATE :** March 30-31, 2022  
**MEASURED BY :** Rawin Sangiemngam

Time	Noise Level [dB(A)]		Standard <sup>1)</sup>
	Leq	L90	
10:00-11:00	63.5	56.4	
11:00-12:00	65.0	57.0	
12:00-13:00	61.7	55.8	
13:00-14:00	64.7	56.7	
14:00-15:00	68.6	56.7	
15:00-16:00	63.1	55.6	
16:00-17:00	62.9	55.6	
17:00-18:00	64.2	56.7	
18:00-19:00	64.3	56.2	
19:00-20:00	62.7	54.7	
20:00-21:00	62.4	53.2	
21:00-00:00	59.9	53.1	
00:00-23:00	59.5	51.9	
23:00-00:00	57.6	51.2	
00:00-01:00	56.9	52.1	
01:00-02:00	55.1	51.8	
02:00-03:00	53.4	51.8	
03:00-04:00	54.4	52.4	
04:00-05:00	55.9	52.8	
05:00-06:00	57.4	52.2	
06:00-07:00	64.3	56.0	
07:00-08:00	66.6	60.2	
08:00-09:00	65.5	58.0	
09:00-10:00	63.9	56.9	
<b>Leq 24 hr</b>	<b>63.0</b>	<b>-</b>	<b>&gt;70</b>
<b>Ldn</b>	<b>63.5</b>	<b>-</b>	<b>-</b>
<b>L90 (min-max)</b>	<b>-</b>	<b>51.2-60.2</b>	<b>-</b>

**Source :** <sup>1)</sup> Notification of the National Environment Board No.15, B.E. 2540 (1997).



Technical Manager

TY/RS/MTM/MTM

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

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E 246168

**Report No. : 2022-5003980 / 003 (Page 1 of 1)**

**Issued date : April 27, 2022**

**CLIENT :** THAI POLYCARBONATE CO., LTD.  
**CONTACT :** Khun Sommai Sriprom  
**ADDRESS :** Padaeng Industrial Estate, 1 Padaeng Rd., Map Ta Phut, Rayong 21150  
 Tel. 038-684-816 Fax. 038-687-776  
 E-mail : Sommai.Srip@th.tpcc-tpac.com

## Analysis Report

**SAMPLE DESIGNATED AS :** Ambient Noise Level  
**MEASUREMENT DATE :** March 30-31, 2022  
**MEASUREMENT LOCATION :** North Fence of Project TPCC  
**MEASURED BY :** Rawin Sangiemngam  
**CALIBRATOR DATA :** Model CR:515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
 Pre Cal : 93.8 dB(A), Post Cal : 93.7 dB(A)  
**SOUND LEVEL METER NO. :** Model CR:171B, Serial No.G078054

Time	Noise Level [dB(A)]		Standard <sup>1/</sup>
	Leq	L90	
10:00-11:00	63.5	56.4	
11:00-12:00	65.0	57.0	
12:00-13:00	61.7	55.8	
13:00-14:00	64.7	56.7	
14:00-15:00	68.6	56.7	
15:00-16:00	63.1	55.6	
16:00-17:00	62.9	55.6	
17:00-18:00	64.2	56.7	
18:00-19:00	64.3	56.2	
19:00-20:00	62.7	54.7	
20:00-21:00	62.4	53.2	
21:00-00:00	59.9	53.1	
00:00-23:00	59.5	51.9	
23:00-00:00	57.6	51.2	
00:00-01:00	56.9	52.1	
01:00-02:00	55.1	51.8	
02:00-03:00	53.4	51.8	
03:00-04:00	54.4	52.4	
04:00-05:00	55.9	52.8	
05:00-06:00	57.4	52.2	
06:00-07:00	64.3	56.0	
07:00-08:00	66.6	60.2	
08:00-09:00	65.5	58.0	
09:00-10:00	63.9	56.9	
Leq 24 hr	63.0	-	>70
Ldn	63.5	-	-
L90 (min-max)	-	51.2-60.2	-

**Source :** <sup>1/</sup> Notification of the National Environment Board No.15, B.E. 2540 (1997).



Technical Manager

TY/RS/MTM/MTM

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E 246168

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Member of the SGS Group

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## ภาคผนวก ก4

ผลการตรวจวัดคุณภาพอากาศในสถานประกอบการ

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Report no. : 5003980  
Issued date : 05/05/2022  
Page : 2 of 14

Customer: THAI POLYCARBONATE Co., Ltd.

## TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (Tuaingnuaen 0201-03-2564-0007)  
Location: Polymer Process/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>iv</sup>		
5003980WP-2	Methylene Chloride	NIOSH 1005	09:38-11:47 a.m.	3.45	25		ppm
	Hepthane	NIOSH 1500	09:38-11:47 a.m.	ND.	500		ppm

Standards: <sup>iv</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (Tuaingnuaen 0202-03-2565-0022)

Remarks:  
ND = Not Detected  
Limit of Quantitation (LOQ) of Heptane = 0.06 ppm  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 1 of 14

Customer: THAI POLYCARBONATE Co., Ltd.

## TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (Tuaingnuaen 0201-03-2564-0007)  
Location: CG Process/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>iv</sup>		
5003980WP-1	Chlorine	NIOSH 6011	09:40-11:45 a.m.	0.01	1		ppm
	Carbon Monoxide	OSHA ID 210	09:40-11:45 a.m.	5.10	50		ppm

Standards: <sup>iv</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (Tuaingnuaen 0202-03-2565-0022)

Remarks:  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager



## Envi Care Monitoring Co., Ltd.

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## Envi Care Monitoring Co., Ltd.

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Report no. : 5003980  
Issued date : 05/05/2022  
Page : 3 of 14

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 4 of 14

Customer: THAI POLYCARBONATE Co., Ltd.

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

### TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: G-Structure/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: P-Structure/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>1)</sup>		
5003980WP-3	Methylene Chloride	NIOSH 1005	09:35-11:43 a.m.	1.16	25		ppm
	Hepthane	NIOSH 1500	09:35-11:43 a.m.	ND.	500		ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: ND = Not Detected  
Limit of Quantitation (LOQ) of Heptane = 0.08 ppm  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>1)</sup>		
5003980WP-4	Methylene Chloride	NIOSH 1005	09:36-11:46 a.m.	2.47	25		ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager



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Report no. : 5003980  
Issued date : 05/05/2022  
Page : 5 of 14

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 6 of 14

Customer: THAI POLYCARBONATE Co., Ltd.

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

### TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: Pelletizing Area/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: Bagging Area/TPCC 1  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022

Completed date: May 5, 2022

Completed date: May 5, 2022

#### Test Results:

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result*	Standards (TWA)		Unit
						Thai <sup>iv</sup>	
5003980/WP-5	Total Dust	NIOSH 0500	09:30-11:48 a.m.	0.13	-	-	mg/m <sup>3</sup>

Standards: <sup>vi</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
						Thai <sup>iv</sup>	
5003980/WP-6	Total Dust	NIOSH 0500	09:32-11:50 a.m.	0.07	-	-	mg/m <sup>3</sup>

Standards: <sup>vi</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager





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Report no. : 5003980  
Issued date : 05/05/2022  
Page : 7 of 14

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 8 of 14

**Customer:** THAI POLYCARBONATE Co., Ltd.

**Customer:** THAI POLYCARBONATE Co., Ltd.

## TEST REPORT

## TEST REPORT

**Job no.:** 5003980  
**Sample type:** Workplace air sample  
**Sampling by:** Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-3007)  
**Location:** Waste Water Treatment/TPCC 1  
**Sampling date:** March 31, 2022  
**Analyzed date:** April 12, 2022-May 3, 2022

**Job no.:** 5003980  
**Sample type:** Workplace air sample  
**Sampling by:** Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
**Location:** CG Process/TPCC 2  
**Sampling date:** March 31, 2022  
**Analyzed date:** April 12, 2022-May 3, 2022

**Completed date:** May 5, 2022

**Completed date:** May 5, 2022

**Test Results:**

**Test Results:**

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA) Thai <sup>VI</sup>	Unit
5003980WP-7	Methylene Chloride	NIOSH 1005	09:42-11:45 a.m.	1.05	25	ppm

**Standards:** <sup>VI</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol. 134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

**Remarks:** - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by

Approved by

Environmental Technician  
[Signature]  
Environmental Manager

Sampling by

Approved by

Environmental Technician  
[Signature]  
Environmental Manager

Environmental Technician  
[Signature]  
Environmental Manager



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Customer: THAI POLYCARBONATE Co., Ltd.

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 9 of 14

## TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: Polymer Process/TPCC 2  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022

Completed date: May 5, 2022

### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)	Unit
5003980/WP-9	Methylene Chloride	NIOSH 1005	10:02 a.m.-12:04 p.m.	2.47	25	ppm
	Hepthane	NIOSH 1500	10:02 a.m.-12:04 p.m.	ND.	500	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565.0022)

Remarks: ND = Not Detected  
Limit of Quantitation (LOQ) of Heptane = 0.09 ppm  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager

Customer: THAI POLYCARBONATE Co., Ltd.

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 10 of 14

## TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: G-Structure/TPCC 2  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022

Completed date: May 5, 2022

### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)	Unit
5003980/WP-10	Methylene Chloride	NIOSH 1005	10:04 a.m.-12:06 p.m.	1.25	25	ppm
	Hepthane	NIOSH 1500	10:04 a.m.-12:06 p.m.	ND.	500	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

Remarks: ND = Not Detected  
Limit of Quantitation (LOQ) of Heptane = 0.08 ppm  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager



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Report no. : 5003980  
Issued date : 05/05/2022  
Page : 11 of 14

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาต 0201-03-2564-0007)  
Location: P-Structure/TPCC 2  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>v</sup>		
5003980WP-11	Methylene Chloride	NIOSH 1005	10:00-12:00 a.m.	1.38	25		ppm

Standards: <sup>v</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 188 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาต 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager

Environmental Technician  
Environmental Manager

Customer: THAI POLYCARBONATE Co., Ltd.

Report no. : 5003980  
Issued date : 05/05/2022  
Page : 12 of 14

### TEST REPORT

Job no.: 5003980  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาต 0201-03-2564-0007)  
Location: Pelletizing Area/TPCC 2  
Sampling date: March 31, 2022  
Analyzed date: April 12, 2022-May 3, 2022  
Completed date: May 5, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>v</sup>		
5003980WP-12	Total Dust	NIOSH 0500	10:20 a.m.-12:28 p.m.	0.21	-		mg/m <sup>3</sup>

Standards: <sup>v</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 188 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาต 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager

Environmental Technician  
Environmental Manager





**Envi Care Monitoring Co., Ltd.**  
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Tel: 02-0424053 Fax: 02-0402944 Email: customer.ecm@gmail.com



**Envi Care Monitoring Co., Ltd.**  
4 SoiBangwaek 53, Bangwaek, Phasi Charoen, Bangkok 10160  
Tel: 02-0424053 Fax: 02-0402944 Email: customer.ecm@gmail.com

**Customer:** THAI POLYCARBONATE Co., Ltd.

**Report no. :** 5003980  
**Issued date :** 05/05/2022  
**Page :** 13 of 14

### TEST REPORT

**Job no.:** 5003980  
**Sample type:** Workplace air sample  
**Sampling by:** Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
**Location:** Bagging Area/TPCC 2  
**Sampling date:** March 31, 2022  
**Analyzed date:** April 12, 2022-May 3, 2022

**Completed date:** May 5, 2022

**Test Results:**

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>VI</sup>		
5003980WP-13	Total Dust	NIOSH 0500	10:15 a.m.-12:20 p.m.	0.07	-		mg/m <sup>3</sup>

**Standards:** <sup>VI</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

**Remarks:** - TLV-TWA = Threshold Limit Value-Time Weighted Average

**Sampling by:**

**Approved by:**

Environmental Technician  
[Signature]  
Environmental Manager

[Redacted Signature]

Environmental Manager

**Customer:** THAI POLYCARBONATE Co., Ltd.

**Report no. :** 5003980  
**Issued date :** 05/05/2022  
**Page :** 14 of 14

### TEST REPORT

**Job no.:** 5003980  
**Sample type:** Workplace air sample  
**Sampling by:** Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
**Location:** Waste Water Treatment/TPCC 2  
**Sampling date:** March 31, 2022  
**Analyzed date:** April 12, 2022-May 3, 2022

**Completed date:** May 5, 2022

**Test Results:**

Sample ID	Parameter	Test method	Sampling time	Result	Standards (TWA)		Unit
					Thai <sup>VI</sup>		
5003980WP-14	Methylene Chloride	NIOSH 1005	09:53-11:58 a.m.	0.96	25		ppm

**Standards:** <sup>VI</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

\* Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

**Remarks:** - TLV-TWA = Threshold Limit Value-Time Weighted Average

**Sampling by:**

**Approved by:**

Environmental Technician  
[Signature]  
Environmental Manager

[Redacted Signature]

Environmental Manager



## Envi Care Monitoring Co., Ltd.

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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 10 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: TPCC2/Waste Water Treatment  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2/</sup>	Standards (TWA) Thai <sup>1/</sup>	Unit
5004545/WP-14	Methylene Chloride	NIOSH 1005	09:33-11:35 a.m.	N.D.	25	ppm

Standards: <sup>1/</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2/</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: N.D. = Not Detected  
Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm  
TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager



## Envi Care Monitoring Co., Ltd.

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Tel: 02-0424053 Fax: 02-0402944 Email: customer.ecm@gmail.com

Report no. : 5004545  
Issued date : 18/07/2022  
Page : 9 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: TPCC2/P-Structure  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2/</sup>	Standards (TWA) Thai <sup>1/</sup>	Unit
5004545/WP-11	Methylene Chloride	NIOSH 1005	09:35-11:38 a.m.	N.D.	25	ppm

Standards: <sup>1/</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2/</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: N.D. = Not Detected  
Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm  
TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician  
Environmental Manager



## Envi Care Monitoring Co., Ltd.

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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 8 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: TPCC2/G-Structure  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545WP-10	Methylene Chloride	NIOSH 1005	08:37-11:38 a.m.	N.D.	25	ppm
	Hepthane	NIOSH 1500	09:37-11:38 a.m.	N.D.	500	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 188 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

Remarks:  
N.D. = Not Detected  
Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm, Heptane = 0.08 ppm  
TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager



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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 7 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: TPCC2/Polymer Process  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545WP-9	Methylene Chloride	NIOSH 1005	09:36-11:37 a.m.	0.43	25	ppm
	Hepthane	NIOSH 1500	09:36-11:37 a.m.	N.D.	500	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 188 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

Remarks:  
N.D. = Not Detected  
Limit of Quantitation (LOQ) of Heptane = 0.08 ppm  
TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager





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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 6 of 10

Report no. : 5004545  
Issued date : 18/07/2022  
Page : 5 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: TPCC2/CG Process  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตฯ 0201-03-2564-0007)  
Location: TPCC1/Waste Water Treatment  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545WP-8	Chlorine	NIOSH 6011	09:35-11:36 a.m.	0.02	1*	ppm
	Carbon Monoxide	OSHA ID 210	09:35-11:36 a.m.	2.90	50	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: - TLV-TWA = Threshold Limit Value-Time Weighted Average  
- The limitation of maximum concentration for hazardous chemical during any time of working

Sampling by:

Approved by:

Environmental Technician

Environmental Manager

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545WP-7	Methylene Chloride	NIOSH 1005	09:18-11:20 a.m.	N.D.	25	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).  
<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตฯ 0202-03-2565-0022)

Remarks: - N.D. = Not Detected  
- Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm  
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:

Environmental Technician

Environmental Manager



## Envi Care Monitoring Co., Ltd.

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## Envi Care Monitoring Co., Ltd.

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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 4 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: TPCC/JP-Structure  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>3)</sup>	Standards (TWA) Thai <sup>iv</sup>	Unit
5004545/WP-4	Methylene Chloride	NIOSH 1005	09:10-11:13 a.m.	N.D.	25	ppm

Standards: <sup>i)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

#### Remarks:

- N.D. = Not Detected
- Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager

Report no. : 5004545  
Issued date : 18/07/2022  
Page : 3 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (ใบอนุญาตเลขที่ 0201-03-2564-0007)  
Location: TPCC/IG-Structure  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>3)</sup>	Standards (TWA) Thai <sup>iv</sup>	Unit
5004545/WP-3	Methylene Chloride	NIOSH 1005	09:16-11:17 a.m.	N.D.	25	ppm
	Hepthane	NIOSH 1500	09:16-11:17 a.m.	N.D.	500	ppm

Standards: <sup>i)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (ใบอนุญาตเลขที่ 0202-03-2565-0022)

#### Remarks:

- N.D. = Not Detected
- Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm, Heptane = 0.08 ppm
- TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Environmental Manager



## Envi Care Monitoring Co., Ltd.

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## Envi Care Monitoring Co., Ltd.

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Report no. : 5004545  
Issued date : 18/07/2022  
Page : 2 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (Tuaingthanaew 0201-03-2564-0007)  
Location: TPCC1/Polymer Process  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545/WP-2	Methylene Chloride	NIOSH 1005	09:14-11:16 a.m.	N.D.	25	ppm
	Heptane	NIOSH 1500	09:14-11:16 a.m.	N.D.	500	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (Tuaingthanaew 0202-03-2565-0022)

Remarks: N.D. = Not Detected  
Limit of Quantitation (LOQ) of Methylene Chloride = 0.29 ppm, Heptane = 0.08 ppm  
TLV-TWA = Threshold Limit Value-Time Weighted Average

Sampling by:

Approved by:



Environmental Technician

Report no. : 5004545  
Issued date : 18/07/2022  
Page : 1 of 10

Customer: THAI POLYCARBONATE Co., Ltd.

### TEST REPORT

Job no.: 5004545  
Sample type: Workplace air sample  
Sampling by: Envi Care Monitoring (Tuaingthanaew 0201-03-2564-0007)  
Location: TPCC1/CG Process  
Sampling date: June 16, 2022  
Analyzed date: June 28, 2022-July 14, 2022  
Completed date: July 18, 2022

#### Test Results:

Sample ID	Parameter	Test method	Sampling time	Result <sup>2)</sup>	Standards (TWA) Thai <sup>1)</sup>	Unit
5004545/WP-1	Chlorine	NIOSH 6011	09:14-11:17 a.m.	0.03	1*	ppm
	Carbon Monoxide	OSHA ID 210	09:14-11:16 a.m.	3.15	50	ppm

Standards: <sup>1)</sup> Notification of the Department of Labor Protection and Welfare, Subject Limitation of Hazardous Chemical Concentration, Vol.134, Special Part 198 D, dated August 3, B.E. 2560 (2017).

<sup>2)</sup> Analyzed by Emex Association Co., Ltd. (Tuaingthanaew 0202-03-2565-0022)

Remarks: TLV-TWA = Threshold Limit Value-Time Weighted Average  
The limitation of maximum concentration for hazardous chemical during any time of working

Sampling by:

Approved by:



Environmental Technician

Environmental Manager



---

## ภาคผนวก ก5

ผลการตรวจวัดระดับเสียงในสถานประกอบการ

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Report No. : 2022-5003980 / 002-1 (Page 1 of 4)

Issued date : April 27, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
CONTACT : Khun Sommai Sriprom  
ADDRESS : Paddaeng Industrial Estate, 1 Paddaeng Rd., Map Ta Phut, Rayong 21150  
Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.tpsc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
MEASUREMENT DATE : March 31, 2022  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.7 dB(A)  
SOUND LEVEL METER NO. : Inspection (PT1) Model NL-21, Serial No. 00396392

Station	Sound Level [dB(A)]
Inspection Room (PT1)	
Sampling Time	09:24-21:24 hr.
1 <sup>st</sup> hr	77.7
2 <sup>nd</sup> hr	66.9
3 <sup>rd</sup> hr	66.4
4 <sup>th</sup> hr	66.2
5 <sup>th</sup> hr	67.3
6 <sup>th</sup> hr	65.8
7 <sup>th</sup> hr	66.3
8 <sup>th</sup> hr	67.2
9 <sup>th</sup> hr	78.7
10 <sup>th</sup> hr	66.5
11 <sup>th</sup> hr	66.5
12 <sup>th</sup> hr	66.5
Leq 12 hrs.	71.7
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

SPRS/MT/MTM



Operational Supports Manager

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Member of the SGS Group

Report No. : 2022-5003980 / 002-1 (Page 2 of 4)

Issued date : April 27, 2022

CLIENT : THAI POLYCARBONATE CO., LTD.  
CONTACT : Khun Sommai Sriprom  
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Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.tpsc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
MEASUREMENT DATE : March 31, 2022  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.8 dB(A)  
SOUND LEVEL METER NO. : Analysis Room (VP1) Model NL-21, Serial No. 00243242

Station	Sound Level [dB(A)]
Analysis Room (VP1)	
Sampling Time	09:17-21:17 hr.
1 <sup>st</sup> hr	65.3
2 <sup>nd</sup> hr	71.0
3 <sup>rd</sup> hr	62.5
4 <sup>th</sup> hr	66.7
5 <sup>th</sup> hr	65.7
6 <sup>th</sup> hr	65.0
7 <sup>th</sup> hr	63.2
8 <sup>th</sup> hr	62.6
9 <sup>th</sup> hr	59.0
10 <sup>th</sup> hr	60.8
11 <sup>th</sup> hr	59.1
12 <sup>th</sup> hr	61.4
Leq 12 hrs.	64.9
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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Operational Supports Manager

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## Report No.

: 2022-5003980 / 002-1 (Page 3 of 4)

Issued date : April 27, 2022

CLIENT  
CONTACT  
ADDRESS: THAI POLYCARBONATE CO., LTD.  
: Khun Sommai Sriprom  
: Pidaeng Industrial Estate, 1 Pidaeng Rd., Map Ta Phut, Rayong 21150  
Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province

MEASUREMENT DATE : March 31, 2022

CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.7 dB(A).

SOUND LEVEL METER NO. : CCR (VP1) Model NL-21, Serial No 0092223

Station	Sound Level [dB(A)]
Sampling Time	CCR (VP1)
1 <sup>st</sup> hr	08.14-10.14 hr.
2 <sup>nd</sup> hr	65.1
3 <sup>rd</sup> hr	62.3
4 <sup>th</sup> hr	62.0
5 <sup>th</sup> hr	61.8
6 <sup>th</sup> hr	63.5
7 <sup>th</sup> hr	63.4
8 <sup>th</sup> hr	63.5
9 <sup>th</sup> hr	62.4
10 <sup>th</sup> hr	67.0
11 <sup>th</sup> hr	62.6
12 <sup>th</sup> hr	63.3
Leq 12 hrs.	63.6
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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Operational Supports Manager

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## Report No.

: 2022-5003980 / 002-1 (Page 4 of 4)

Issued date : April 27, 2022

CLIENT  
CONTACT  
ADDRESS: THAI POLYCARBONATE CO., LTD.  
: Khun Sommai Sriprom  
: Pidaeng Industrial Estate, 1 Pidaeng Rd., Map Ta Phut, Rayong 21150  
Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province

MEASUREMENT DATE : March 31, 2022

CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.8 dB(A).

SOUND LEVEL METER NO. : CCR (PT1) Model NL-21, Serial No 00398390

Station	Sound Level [dB(A)]
Sampling Time	CCR (PT1)
1 <sup>st</sup> hr	09.22-21.22 hr.
2 <sup>nd</sup> hr	75.3
3 <sup>rd</sup> hr	69.9
4 <sup>th</sup> hr	66.7
5 <sup>th</sup> hr	65.9
6 <sup>th</sup> hr	66.6
7 <sup>th</sup> hr	66.2
8 <sup>th</sup> hr	68.3
9 <sup>th</sup> hr	67.7
10 <sup>th</sup> hr	71.4
11 <sup>th</sup> hr	68.8
12 <sup>th</sup> hr	69.0
Leq 12 hrs.	65.2
Standard <sup>1)</sup>	69.5

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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Report No.

: 2022-5003980 / 002-2 (Page 1 of 2)

Issued date : April 27, 2022

CLIENT  
CONTACT  
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Tel. 038-684-816 Fax. 038-684-821  
E-mail : Sommai.Srip@th.ipcc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 2 Plant, Rayong Province

MEASUREMENT DATE : March 31, 2022

CALIBRATOR DATA

: Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.6 dB(A)

SOUND LEVEL METER NO. : CCR (VP2) Model NL-21 Serial No. 0095539

Station	Sound Level [dB(A)]
Sampling Time	CCR (VP2)
1 <sup>st</sup> hr	66.2
2 <sup>nd</sup> hr	62.8
3 <sup>rd</sup> hr	64.6
4 <sup>th</sup> hr	65.4
5 <sup>th</sup> hr	67.2
6 <sup>th</sup> hr	67.8
7 <sup>th</sup> hr	65.8
8 <sup>th</sup> hr	63.5
9 <sup>th</sup> hr	65.0
10 <sup>th</sup> hr	64.8
11 <sup>th</sup> hr	62.3
12 <sup>th</sup> hr	67.0
Leq 12 hrs.	65.5
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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Report No.

: 2022-5003980 / 002-2 (Page 2 of 2)

Issued date : April 27, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 2 Plant, Rayong Province

MEASUREMENT DATE : March 31, 2022

CALIBRATOR DATA

: Model CR-515, Cirrus, Serial : 88350, Calibration Value Reference : 94.1 dB(A),  
Pre Cal : 93.8 dB(A), Post Cal : 93.9 dB(A)

SOUND LEVEL METER NO. : CCR (PT2) Model NL-21 Serial No. 00398395

Station	Sound Level [dB(A)]
Sampling Time	CCR (PT2)
1 <sup>st</sup> hr	64.8
2 <sup>nd</sup> hr	62.9
3 <sup>rd</sup> hr	62.5
4 <sup>th</sup> hr	63.0
5 <sup>th</sup> hr	63.0
6 <sup>th</sup> hr	62.6
7 <sup>th</sup> hr	64.1
8 <sup>th</sup> hr	61.4
9 <sup>th</sup> hr	63.2
10 <sup>th</sup> hr	64.8
11 <sup>th</sup> hr	60.7
12 <sup>th</sup> hr	62.5
Leq 12 hrs.	63.1
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-1 (Page 1 of 4)

Issued date : June 30, 2022

CLIENT  
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E-mail : Sommai.Srip@th.tpsc-lpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
MEASUREMENT DATE : June 16, 2022  
CALIBRATOR DATA : Model CR:515, Cirrus, Serial : 86373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.5 dB(A), Post Cal : 93.5 dB(A)  
SOUND LEVEL METER NO. : Inspection (PT1) Model CR:161B, Serial No. G080136

Station	Sound Level [dB(A)] Inspection Room (PT1)
Sampling Time	09.06-21.06 hr.
1 <sup>st</sup> hr	68.6
2 <sup>nd</sup> hr	67.2
3 <sup>rd</sup> hr	67.1
4 <sup>th</sup> hr	66.9
5 <sup>th</sup> hr	67.3
6 <sup>th</sup> hr	67.4
7 <sup>th</sup> hr	67.4
8 <sup>th</sup> hr	67.3
9 <sup>th</sup> hr	66.9
10 <sup>th</sup> hr	67.0
11 <sup>th</sup> hr	66.9
12 <sup>th</sup> hr	66.6
Leq 12 hrs.	67.2
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-1 (Page 2 of 4)

Issued date : June 30, 2022

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## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
MEASUREMENT DATE : June 16, 2022  
CALIBRATOR DATA : Model CR:515, Cirrus, Serial : 86373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.5 dB(A), Post Cal : 93.5 dB(A)  
SOUND LEVEL METER NO. : Analysis Room (VP1) Model CR:161B, Serial No. G300759

Station	Sound Level [dB(A)] Analysis Room (VP1)
Sampling Time	08.59-20.59 hr.
1 <sup>st</sup> hr	67.5
2 <sup>nd</sup> hr	66.2
3 <sup>rd</sup> hr	61.5
4 <sup>th</sup> hr	60.3
5 <sup>th</sup> hr	65.3
6 <sup>th</sup> hr	65.0
7 <sup>th</sup> hr	65.2
8 <sup>th</sup> hr	66.0
9 <sup>th</sup> hr	64.8
10 <sup>th</sup> hr	62.7
11 <sup>th</sup> hr	60.7
12 <sup>th</sup> hr	62.8
Leq 12 hrs.	64.5
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-1 (Page 3 of 4)

Issued date : June 30, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.5 dB(A), Post Cal : 93.5 dB(A)  
SOUND LEVEL METER NO. : CCR (VP1) Model CR-161B, Serial No G300763MEASUREMENT DATE : June 16, 2022  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.5 dB(A), Post Cal : 93.5 dB(A)  
SOUND LEVEL METER NO. : CCR (PT1) Model CR-161B, Serial No G300764

Station	Sound Level [dB(A)]
Sampling Time	CCR (VP1)
1 <sup>st</sup> hr	65.7
2 <sup>nd</sup> hr	64.8
3 <sup>rd</sup> hr	63.6
4 <sup>th</sup> hr	63.3
5 <sup>th</sup> hr	65.4
6 <sup>th</sup> hr	66.9
7 <sup>th</sup> hr	64.3
8 <sup>th</sup> hr	63.6
9 <sup>th</sup> hr	61.7
10 <sup>th</sup> hr	63.5
11 <sup>th</sup> hr	62.9
12 <sup>th</sup> hr	62.3
Leq 12 hrs.	64.2
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-1 (Page 4 of 4)

Issued date : June 30, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 1 Plant, Rayong Province  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.5 dB(A), Post Cal : 93.5 dB(A)  
SOUND LEVEL METER NO. : CCR (PT1) Model CR-161B, Serial No G300764

Station	Sound Level [dB(A)]
Sampling Time	CCR (PT1)
1 <sup>st</sup> hr	64.8
2 <sup>nd</sup> hr	63.0
3 <sup>rd</sup> hr	61.6
4 <sup>th</sup> hr	61.4
5 <sup>th</sup> hr	63.5
6 <sup>th</sup> hr	64.2
7 <sup>th</sup> hr	70.6
8 <sup>th</sup> hr	65.2
9 <sup>th</sup> hr	64.8
10 <sup>th</sup> hr	66.9
11 <sup>th</sup> hr	68.4
12 <sup>th</sup> hr	64.1
Leq 12 hrs.	65.7
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-2 (Page 1 of 2)

Issued date : June 30, 2022

CLIENT  
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## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 2 Plant, Rayong Province  
MEASUREMENT DATE : June 16, 2022  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.7 dB(A), Post Cal : 93.7 dB(A)  
SOUND LEVEL METER NO. : CCR (VP2) Model NL-21 Serial No. 00965839

Station	Sound Level [dB(A)]
Sampling Time	CCR (VP2)
1 <sup>st</sup> hr	65.8
2 <sup>nd</sup> hr	65.7
3 <sup>rd</sup> hr	62.9
4 <sup>th</sup> hr	65.0
5 <sup>th</sup> hr	63.3
6 <sup>th</sup> hr	62.9
7 <sup>th</sup> hr	65.5
8 <sup>th</sup> hr	62.1
9 <sup>th</sup> hr	61.9
10 <sup>th</sup> hr	66.0
11 <sup>th</sup> hr	63.5
12 <sup>th</sup> hr	64.1
Leq 12 hrs.	64.3
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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## Report No.

: 2022-5004545 / 002-2 (Page 2 of 2)

Issued date : June 30, 2022

CLIENT  
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E-mail : Sommai.Srip@th.tpsc-tpac.com

## Analysis Report

SAMPLE DESIGNATED AS : Workplace Noise Level  
MEASUREMENT LOCATION : TPCC 2 Plant, Rayong Province  
MEASUREMENT DATE : June 16, 2022  
CALIBRATOR DATA : Model CR-515, Cirrus, Serial : 88373, Calibration Value Reference : 93.8 dB(A),  
Pre Cal : 93.7 dB(A), Post Cal : 93.7 dB(A)  
SOUND LEVEL METER NO. : CCR (PT2) Model NL-21 Serial No. 00959394

Station	Sound Level [dB(A)]
Sampling Time	CCR (PT2)
1 <sup>st</sup> hr	66.0
2 <sup>nd</sup> hr	63.0
3 <sup>rd</sup> hr	62.2
4 <sup>th</sup> hr	64.2
5 <sup>th</sup> hr	64.9
6 <sup>th</sup> hr	63.6
7 <sup>th</sup> hr	63.9
8 <sup>th</sup> hr	65.8
9 <sup>th</sup> hr	64.6
10 <sup>th</sup> hr	67.0
11 <sup>th</sup> hr	65.8
12 <sup>th</sup> hr	62.6
Leq 12 hrs.	64.7
Standard <sup>1)</sup>	>87

Source : <sup>1)</sup> Notification of the Ministry of Industry, Subjected "Safety Protection Measure for Industry about Working Condition", B.E. 2546 (2003) dated December 3, B.E. 2546 (2003).

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**ภาคผนวก ก6**

**ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง**

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Reviewed by: <input type="checkbox"/> HR/AD <input type="checkbox"/> ME <input type="checkbox"/> PM <input type="checkbox"/> PT <input type="checkbox"/> QR <input checked="" type="checkbox"/> QR-80 <input type="checkbox"/> LO <input type="checkbox"/>	Signature: _____								
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		K. Anuporn M. - VP							
		K. Songpol S. - Env. Controller							
		K. Sorawee T. - Env. Manager							
Step 2: Laws Controller: <input checked="" type="checkbox"/> YES (Conforms and sign in the attached document)	Review: _____								
VP: _____									
Step 3: PM: <input type="checkbox"/> YES (Comment and sign in the attached document)									
TPAC: _____									
Step 4: SHE: <input checked="" type="checkbox"/> YES (Typed in P1 Mainframe)									
SHE: _____									
Step 5: Company representative (Signature)	Acknowledge & Keep it								
President: _____									
Delegated: _____									
Step 6: Send to government agency using original 5.9									
HR/AD: <input type="checkbox"/> YES									
ME: <input type="checkbox"/> YES									
PT: <input type="checkbox"/> YES									
QR: <input type="checkbox"/> YES									

THAI POLYCARBONATE CO., LTD.

QC-RD Department

TPCC Waste Gas and Waste Water Monthly Report

Waste Water Analysis (In-house/5d/5d)	6-Jan-2022	Date: 29/01/2021												
Sampling Point	Sampling Date	Time	Analysis Item											
			Temp (°C)	pH	COD (mg/l)	BOD (mg/l)	SS (mg/l)	TDS (mg/l)	Oil & Grease (mg/l)	TOR (mg/l)	Gu (mg/l)	Fe (mg/l)	Cadmium (mg/l)	Remark
					* Result (mg/l)    Ref Data (mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(MPN/100ML)	
	* Specification		40	8.5-9.9	<120	<120	<20	<60,000	2.0	<200	<2.0	<2.0		
1. Water inlet before treatment (VPI1: V-003)	06/01/2022	9:00	37.80	8.72	<40	29	61	4	38400	2.2	21			
2. Water inlet before treatment (VPI2: V-003)	06/01/2022	9:00	38.60	9.56	<40	36	49	5	60840	1.9	63			
3. Water outlet after treat (VPI1: V-015) *	06/01/2022	9:00	38.60	7.82	<40	9	4	2	29020	1.3	4	0.004	0.000	
4. Water outlet after treat (VPI2: V-015) *	06/01/2022	9:00	38.60	8.26	<40	12	3	2	42340	0.6	6	0.003	0.000	
5. Effluent at TPCC (36-016)	06/01/2022	9:00	38.40	8.27	<40	16	4	2	29040	0.7	11			
6. Far from intersection between main drain and lateral drain about 20m (Point B)	06/01/2022	9:00	34.00	8.30	<40	17	5	2	27940	1.0	10			240
7. Lateral drain of Pidding Industrial Estate (Point C)														510

\* Specification Refer ZEM-0001: Outlet after treatment at TPCC: V-015/015

\* Jan-21 start report New COD method (Changed from 5220C Open reflux -> 5220B Closed reflux)

Waste Gas Analysis (In-house) Sampling point: Others Back EA  
GC Detector: GC-8000

Sampling point	V-047F POC HC Analyser			Others Back EA
	V-047A	V-047B	V-047C	
Date/Time	06/01/2022 14:30	06/01/2022 17:30		
Velocity (m/s)	2.00	2.00		
Flow rate (m³/h)	0.16	0.16		
HC flow (g/h)	<0.001 g/h	<0.01	<0.112 g/h	
HC flow (mg/m³)	<0.001 mg/m³	<0.1	<1.029 mg/m³	

Ref for New Low: For Color: 6000 and Free CO: 1000-10000000

Date/Time	V-047F		Sampling point	Station 8
	V-047A	V-047B		
Date/Time	06/01/2022 14:30	06/01/2022 17:30		
Free CO - 1 mg/l	<0.1	<0.1		
Color - 1000000	11	6	11	At Original pH
Color - 1000000	12	6	11	At pH 7.3
Free CO LOD - 0.1 mg/l			Color LOD: 1000	

\* Not as specific data - Sampling every 15 min

Sampling point	Others Back EA	V-047F POC HC Analyser				Others Back EA	V-047F	Others Back EA	V-047F	Others Back EA	V-047F	Others Back EA	V-047F
		V-047A	V-047B	V-047C	V-047D								
Date/Time		06/01/2022 14:30	06/01/2022 17:30	06/01/2022 14:30	06/01/2022 17:30		06/01/2022 14:30	06/01/2022 14:30	06/01/2022 17:30	06/01/2022 17:30	06/01/2022 14:30	06/01/2022 14:30	06/01/2022 14:30
Flow rate (m³/h)		2.00	2.00	2.00	2.00		2.00	2.00	2.00	2.00	2.00	2.00	2.00
HC flow (g/h)	<1.000 g/h	<0.01	<0.01	<0.01	<1.000 g/h	<0.01	<1.000 g/h	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HC flow (mg/m³)	<0.001 mg/m³	<0.1	<0.1	<0.1	<0.001 mg/m³	<0.1	<0.001 mg/m³	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HC flow (g/h)	<1.000 g/h	<0.01	<0.01	<0.01	<1.000 g/h	<0.01	<1.000 g/h	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HC flow (mg/m³)	<0.001 mg/m³	<0.1	<0.1	<0.1	<0.001 mg/m³	<0.1	<0.001 mg/m³	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Remark: Detection limit TPCC Method: NO - Not detected (Less than 0.01 g/h and Less than 1 mg/m³)

ฉบับนี้จัดทำโดยฝ่าย QC และทีมเทคนิคการวิเคราะห์ - การควบคุม - โทร 0-2-2901

ฝ่ายเทคนิค - โทร 0-2-2901

Review by QC-Sup

Approved by Department Manager

17-Jan-22

บริษัทฯ ขอแจ้งว่าผลการวิเคราะห์ข้อมูลข้างต้นเป็นข้อมูลเบื้องต้นเท่านั้น  
 หากมีข้อสงสัยหรือต้องการข้อมูลเพิ่มเติม กรุณาติดต่อฝ่ายปฏิบัติการ โทร. 0-105-6-2901

Review by QC-Sup: \_\_\_\_\_  
 Approved by Department Manager: \_\_\_\_\_











SHE Laws Document (PI) Circulation Memo									
Type: <input type="checkbox"/> Form <input checked="" type="checkbox"/> Report <input type="checkbox"/> Other	Doc No. PI-0043								
Subject: TPCC wastewater monthly sampling and analysis report	Date: 05/2022	Date: 27/05/2022							
Prepared by: K. CHALERMISAK W. (Issue: Review, follow up/keep Scan Copy)	Issue: QR-TPCC	Date: 27/05/2022							
Reviewed by: <input type="checkbox"/> HR/AD <input type="checkbox"/> MT <input type="checkbox"/> PM <input type="checkbox"/> PT <input type="checkbox"/> PC <input type="checkbox"/> QC/HD <input type="checkbox"/> LG <input type="checkbox"/>	Reviewed Date: _____								
Checked by: _____	Checked Date: _____								
Step 1: Signature: <input checked="" type="checkbox"/> YES (Confirm and fill concerned data and/or accept)	Name (Specified by INV)	Initial Sign	Sign Date	Comment					
QR-TPCC	K. Chalermisak W. - QR-TPCC		27 May 22						
	K. Sanya T. - QR-TPCC		27 May 22						
	K. Winit C. - QR-TPCC		27 May 22						
	K. Anupun M. - VP								
	K. Songpol S. - Env. Controller								
	K. Sornwase T. - Env. Manager								
Step 2: Laws Controller: <input checked="" type="checkbox"/> YES (Confirm and sign in the attached document)	K. Songpol S. - Env. Controller			Review					
Step 3: PM: <input type="checkbox"/> YES (Comment and sign in the attached document)									
TPCC									
Step 4: SHE: <input checked="" type="checkbox"/> YES (Specify in PI Manual)									
SHE	K. Sorabook K./K. Namsak S. K. Chongsorn P./K. Sornsa S.			Acknowledge & Keep It					
Step 5: Company representative/Authorized	(Signature and seal with the attached document)								
YES									
President									
Independent									
Step 6: Send to government agency with initial 5, 9									
HR/AD									
YES									
Safe									
YES									

**Circulation memowork flow**

TPCC Waste Gas and Waste Water Monthly Report																																																																																																																																																												
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<p>Analysis by 3<sup>rd</sup> party - SGS</p> <p>SGS Report No. : 1-197</p> <p>SGS Report No. : 1-197-0-6038</p> <p>SGS Report No. : 1-101-0-0338</p>																																																																																																																																																												
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<p>Note: Waste Gas MC/HE analysis by QR-TPCC. Internal monitoring for environment.</p> <p>Verify by QR-TPCC Sup. : </p> <p>Approved by Department Manager : </p> <p style="text-align: right;">27 May 22</p>																																																																																																																																																												

**SHE Laws Document (PI) Circulation Memo**

Type: ☐ Internal ☒ Target ☐ Other Doc No. JY-019-015

Subject: TPCC wastewater monthly sampling and analysis report 06/2022 (Jun-22)

Sample: K.CHALERMSEK W. (Name, Please follow updating Scan Copy) Dept: QR-TPCC Date: 28/06/2022

Drawn: ☐ HR/AD ☐ MT ☐ P/OC ☐ VP ☐ PT ☐ PDR ☐ QC/ID ☐ LG ☐

Copy to: ☐ HR/AD ☐ MT ☐ P/OC ☐ VP ☐ PT ☐ PDR ☐ QC/ID ☐ LG ☐

Step 2: Signature: ☒ YES (Confirm and fill concerned data under arrow)

QR-TPCC: K.Chalermsek W. - QR-TPCC 28-Jun-22  
K.Singy T. - QR-TPCC 28-Jun-22  
K.Witai C. - QR-TPCC 28-Jun-22  
K.Ampom M. - VP  
K.Songpol S. - Env. Controller  
K.Somwae T. - Env. Manager

Step 2: Law Controller: ☒ YES (Comment and sign in the attached document)

VP: K.Songpol S. - Env. Controller Review

Step 2: PM: ☐ YES (Comment and sign in the attached document)

TPCC: ☐ YES (Comment and sign in the attached document)

Step 2: SHE: ☒ YES (Update in PI Masterfile)  
K.Korachon K./K.Munrattak S.  
K.Chandee P./K.Sornmal S.  
Acknowledge & Keep it

Step 3: Company representation/Chairman: (Approve and send back the attached document)

YES ☐ President ☐ Delegate

Step 4: Senders (Send to government agency using original 5.9)

HR/AD ☐ YES ☐ YES ☐ YES ☐ YES

**Circulation memowork flow**

```

graph TD
    A[Preparer Start] --> B[Reviewer by DM]
    B --> C[Laws Controller]
    C --> D[PM]
    D --> E[SHE]
    E --> F[Company representative]
    F --> G[Sender]
    G --> A
    
```

If any comment

Send a copy

**TPCC Waste Gas and Waste Water Monthly Report**

Waste Water Analysis (Internal/Factory) 15-Jun-2022

Sampling Point	Sampling Date	Time	Temp (°C)	pH	COD		BOD	SS		Oil & Grease	TSS	Cu	Pb	Cadmium	Remark
					Report (mg/l)	Raw Data (mg/l)		(mg/l)	(mg/l)						
1. Water inlet before treatment (WP#1: V-003)	15/06/2022	10:00	36.9	9.8	< 40	19	3	< 2.5	34200	< 2	11				
2. Water inlet before treatment (WP#2: V-003)	15/06/2022	10:00	39.7	9.8	< 40	17	17	5	56250	< 2	29				
3. Water outlet after treatment (WP#1: V-015)	15/06/2022	10:00	36.2	8.4	< 40	19	3	< 2.5	28450	< 2	9	0.02	< 0.01		
4. Water outlet after treatment (WP#2: V-015)	15/06/2022	10:00	37.8	8.6	< 40	44	13	3	42850	< 2	9	< 0.01	< 0.01		
5. Effluent of TPCC (248-016)	15/06/2022	10:00	36.3	8.6	< 40	32	5	8	27000	< 2	13				
6. For Even Interconnection between main drain and lateral drain about 50 m (Point B)	15/06/2022	10:00	35.8	8.5	< 40	38	3	4	28700	< 2	10			33	
7. Lateral drain of Packaging Industrial Estate (Point C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SD

\* Specification Refer 2534-0001: Control after treatment of TPCC V-015/015

Analysis by 3<sup>rd</sup> party: SGS

1-197-4-6538

Waste Gas Analysis (Internal/Factory) 15-Jun-2022

MC Absorber

Sampling point	V-015 MC Absorber		V-016 MC Absorber		V-017 MC Absorber		V-018 MC Absorber	
	Online Stack Gas	V-015	V-016	Online Stack Gas	V-017	V-018	Online Stack Gas	V-018
Date / Time								
Flow rate (m³/h)		500-550 (250-300)						
MC load (g/h)		< 0.07 g/h		< 0.18 g/h		< 0.01		
MC load (mg/m³)		< 0.06 mg/m³		< 0.12 mg/m³		0.3		

Special plan for Color (DME) and Free CO<sub>2</sub> (V-015 and Station B)

Date / Time	V-015	Station B	Station C
27-Jun-22	11.0	11.0	11.0
27-Jun-22	11.0	11.0	11.0
27-Jun-22	11.0	11.0	11.0

Test by ALC-300 (Please 1: Free for reference)

MC Absorber

Sampling point	V-015 MC Absorber		V-016 MC Absorber		V-017 MC Absorber		V-018 MC Absorber	
	Online Stack Gas	V-015	V-016	Online Stack Gas	V-017	V-018	Online Stack Gas	V-018
Date / Time								
Flow rate (m³/h)		500-550 (250-300)						
MC load (g/h)		< 0.07 g/h		< 0.18 g/h		< 0.01		
MC load (mg/m³)		< 0.06 mg/m³		< 0.12 mg/m³		0.3		

Result: Detected by TPCC Method. ND = Not detected (Less than 0.01 g/h and Less than 1 mg/m³)

Note: Waste Gas MCNE analysis by QR-TPCC, Internal monitoring for environment.

Verify by QR-TPCC Sup. 28-Jun-22

Approved by Department Manager: 28-Jun-22

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## **ภาคผนวก ข**

- **สำเนาหนังสือรับรองห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอสจีเอส (ประเทศไทย) จำกัด**
  - **สำเนาใบรับรองมาตรฐาน ISO 9001 : 2015**
  - **สำเนาหนังสือรับรองระบบงาน : ISO/IEC 17020 : 2005**
  - **สำเนาหนังสือรับรองระบบงาน : ISO/IEC 17020 : 2012**
-





ที่ อภ ๐๓๐๑(๑)/ ๔๗ ๘

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

## ๒.๑ เมษายน ๒๕๖๕

เรื่อง ต่ออายุหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอสจีเอส (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียนต่ออายุ/ส่งมอบเปลี่ยนแปลงอุปกรณ์และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๔ มกราคม ๒๕๖๕

สิ่งส่งมาด้วย เอกสารแบบยื่นขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอสจีเอส (ประเทศไทย) จำกัด จำนวน ๑ แผ่น

ตามที่หนังสืออ้างถึง บริษัท เอสจีเอส (ประเทศไทย) จำกัด ขอต่ออายุหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๐๑๐ สถานที่ตั้งเลขที่ ๔๗/๘-๖๐ และ ๔๗/๖๓ ตรอกนอกแยกเขตถนนพระราม ๓ แขวงทองหล่อ เขตวัฒนา กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอสจีเอส (ประเทศไทย) จำกัด ต่ออายุหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

### ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวฉิม เชื้อสำราญ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๔
- ๒) นางสาวพัชร ตรีพรเจริญ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๒
- ๓) นางสาวภาพร ทองแท่ง ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๓
- ๔) นางสาวศศิธรพรหม ไพรอนันต์ถาวร ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๔
- ๕) นางสาวกรกฎ จันทร์สมบูรณ์ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๕
- ๖) นางสาวสุภาวดี ชิตเพชร ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๖
- ๗) นายพร ภู่อินทร์ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๗
- ๘) นางสาวพัฒนภรณ์ เมืองแก้ว ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๘
- ๙) นางศศิพร อิมวิไลวรรณ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๙

### ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวฉิมวี พัสสิก ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๑
- ๒) นางสาวสุภา จรุงศรีสื ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๒
- ๓) นางสาวสุภาวดี สุภาวดี ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๓
- ๔) นางสาวณัฏฐา ทนัสกุล ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๔
- ๕) นางสาวสิริวรรณ เสขิพย์ไฉย ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๕
- ๖) นางสาวสุนทร มีคำ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๖

๗) นายพันธุวิช



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



- ๗) นายพันธุวิช ไตรเลิศสมุทร ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๗
- ๘) นายพันธุวิช ตรีพรเจริญ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๘
- ๙) นางสาวเด่นภา อรุณจิตต์ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๐๙
- ๑๐) นายวิวัฒน์ สุขะ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๐
- ๑๑) นายจิตรเทพ มีเงิน ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๑
- ๑๒) นายวีรพงษ์ เท่งตระกูล ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๒
- ๑๓) นางสาวพนิดา บุญเจริญ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๓
- ๑๔) นางสาวสุพราภา แก้วพันธ์ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๔
- ๑๕) นางสาวมัลลิกา เสือประภากุล ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๕
- ๑๖) นายรัชพล มิ่งขวัญ ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๖
- ๑๗) นางสาวอรนุช ทองอุ่น ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๗
- ๑๘) นางสาววิยาภรณ์ เสือเดช ทะเบียนเลขที่ ๖-๐๑๐-๙-๐๐๑๘

ค. ขอรับสารเคมีที่ได้รับทะเบียนเพื่อให้วิเคราะห์ในน้ำเสีย ตามสิ่งส่งมาด้วย

หนังสือแจ้งจะหมดอายุในวันที่ ๓๐ มกราคม ๒๕๖๕ หากประสงค์จะต่ออายุหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ทั้งในรูปแบบเอกสารหรือแบบ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ ทั้งนี้รับใช้กรมโรงงานอุตสาหกรรม ตาม QR Code ที่ยื่นหนังสือฉบับนี้

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ



ผู้ประสานงาน/โฆษก/โฆษกพิเศษ  
ผู้อำนวยการศูนย์ปฏิบัติการ  
กรมโรงงานอุตสาหกรรม



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

กองวิจัยและพัฒนายุทธศาสตร์  
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบผลิตภัณฑ์และทะเบียนห้องปฏิบัติการ  
โทร. ๐ ๒๕๓๐ ๖๒๑๒ ต่อ ๒๐๓-๕  
โทรสาร ๐ ๒๕๓๐ ๖๒๑๒ ต่อ ๒๑๔๔  
ไปรษณีย์อิเล็กทรอนิกส์ salsakul@dlw.mait.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



ที่ อภ ๐๓๐๐(๓)/ ๑๑ ๒๔ ๑

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๘ พฤศจิกายน ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรและสามเหลี่ยมพีทที่วิเคราะห์  
เรียน กรรมการผู้จัดการ บริษัท เอสซีแอล (ประเทศไทย) จำกัด  
อ้างถึง คำขอเปลี่ยนแปลงบุคลากร และข้อมติสามเหลี่ยมพีทของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๙ สิงหาคม ๒๕๖๕

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสามเหลี่ยมพีทวิเคราะห์  
บริษัท เอสซีแอล (ประเทศไทย) จำกัด จำนวน ๙ แผ่น  
ตามที่อ้างถึง บริษัท เอสซีแอล (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน  
ว-๑๓๙ สถานที่ตั้งเลขที่ ๑/๒๐๙ และ ๓/๒๐๙ หมู่ที่ ๓ ตำบลบ้านฉาง อำเภอบ้านฉาง จังหวัดระยอง  
ขอเปลี่ยนแปลงบุคลากรและสามเหลี่ยมพีทวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้  
๓. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๘ ราย  
๑) นายอัมพร บุญพันธ์ ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๑  
๒) นายอัมพร ศิริโชค ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๓  
๓) นายกิตติคุณ ทาสังเพียร ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๕  
๔) นายเจนจิตร ศรีเนม ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๖  
๕) นายพรรัตน์ จำปานวม ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๗  
๖) นายสืบชะตา ศรีโพธิ์ ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๘  
๗) นางสาวสิริรัตน์ แสงรัมย์ ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๕๙  
๘) นางสาวพรวิไลรัตน์ กันต์ ทะเบียนเลขที่ ๖-๑๓๙-๖-๙๖๖๐  
๒. ให้เพิ่มขอบข่ายสามเหลี่ยมพีทวิเคราะห์ในน้ำเสีย จำนวน ๓ รายการ นำได้ดังนี้ จำนวน ๓๕ รายการ  
๒ รายการ ยกเลิกเสีย (ปล่องระบาย) จำนวน ๑๖ รายการ สลับปฏิบัติการด้วยวิธีอื่น  
และคืน จำนวน ๕ รายการ รวมทั้งสิ้นจำนวน ๖๐ รายการ ตามสิ่งส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะมีผลต่ออายุพร้อมหนังสือต่ออายุวันขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกชน ที่ อภ ๐๓๐๐(๓)/๙๖๖๐ ลงวันที่ ๒๕ มีนาคม ๒๕๖๓ คือในวันที่ ๑๒ ตุลาคม ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



ผู้อำนวยการกองโรงงาน  
ศูนย์วิจัยและเตือนภัยมลพิษทางอากาศ  
โทร. ๐ ๓๖๐๕ ๙๖๖๓-๓  
ไปรษณีย์อิเล็กทรอนิกส์ airw@doeh.go.th

ผู้อำนวยการกองโรงงาน  
ศูนย์วิจัยและเตือนภัยมลพิษทางอากาศ  
โทร. ๐ ๓๖๐๕ ๙๖๖๓-๓  
ไปรษณีย์อิเล็กทรอนิกส์ airw@doeh.go.th

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอสซีแอล (ประเทศไทย) จำกัด  
ที่ อภ ๐๓๐๐(๓)/ ๑๑ ๒๔ ๖  
เลขทะเบียน ๖-๑๓๐  
ลงวันที่ ๒๑ เมษายน ๒๕๖๕

ขอขอบคุณสามเหลี่ยมพีทที่ได้รับการขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๐ รายการ

นับเสีย จำนวน 20 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method
2	$\alpha$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method
3	$\beta$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method
4	$\delta$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method
5	$\gamma$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method
6	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method
7	p,p'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method
8	p,p'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method
9	o,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method
10	p,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method
11	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method
12	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method
13	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method
14	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method
15	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method
16	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method
17	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method
18	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method
19	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method
20	Temperature	Laboratory and Field Methods

เอกสารอ้างอิง

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23<sup>rd</sup> ed. Washington, DC: APHA, 20

เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและเปิดสารเคมีที่วิเคราะห์  
บริษัท เอสซีเอส (ประเทศไทย) จำกัด เลขทะเบียน ๖-๑๑๗  
ที่ อก ๐๓๐๐(๓)/๑๑๒๕๖ ลงวันที่ ๑๘ พฤศจิกายน ๒๕๖๔

ขอถ่ายสารเคมีที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๖๑ รายการ

นี้เสีย จำนวน 3 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method <sup>(3)</sup>
2	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(3)</sup>
3	Temperature	Field Method <sup>(3)</sup>

นี้ได้รับ จำนวน 2 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method <sup>(3)</sup>
2	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(3)</sup>

อากาศเสีย (ปล่องระบาย) จำนวน 16 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
2	Cadmium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
3	Carbon Monoxide	Instrumental Analyzer Method <sup>(4)</sup>
4	Chromium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
5	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
6	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method <sup>(5)</sup>
7	Manganese	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>

ผู้ดำเนินการ  
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

8 Nickel...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
8	Nickel	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
9	Opacity	Ringelmann's Method <sup>(1)</sup>
10	Oxide of Nitrogen	Instrumental Analyzer Method <sup>(4)</sup>
11	Selenium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
12	Sulfur Dioxide	Instrumental Analyzer Method <sup>(4)</sup>
13	Tellurium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
14	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
15	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
16	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>(5)</sup>

สิ่งปฏิกูลหรือวัสดุที่ไม่ได้ตัว จำนวน 35 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(3,4)</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>

ผู้ดำเนินการ  
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก  
5 Beryllium...



ลำดับที่	สารเคมี	วิธีตรวจ
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
7	Chlordane	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
8	Chromium (VI)	1) Waste Extraction, Digestion, Colorimetric Method <sup>(2,13)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(7,13)</sup>
9	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
10	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
11	Dieldrin	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
12	DDO	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
13	DDE	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
14	DOT	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
15	2,4-D (2,4-Dichlorophenoxyacetic acid)	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>

ผู้ชำนาญการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

16 Endrin...

ลำดับที่	สารเคมี	วิธีตรวจ
16	Endrin	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
17	Heptachlor	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
18	Kepone	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
19	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
20	Lindane	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
21	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(2,14)</sup> 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(14)</sup>
22	Methoxychlor	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
23	Mirex	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(6,11)</sup>
25	Polychlorinated Biphenyls (PCBs)	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>
26	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic Method <sup>(2,8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8,16)</sup>

ผู้ชำนาญการ

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

27 Nickel...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
27	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>
28	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>
29	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>
30	Silvex; 2,4,5-Trichlorophenoxypropionic acid	1) Waste Extraction, Gas Chromatographic Method <sup>(2.8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8.9)</sup>
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>
32	Toxaphene	1) Waste Extraction, Gas Chromatographic Method <sup>(2.8)</sup> 2) Ultrasonic Extraction, Gas Chromatographic Method <sup>(8.9)</sup>
33	Trichloroethylene	Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(2.18)</sup> Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(10.18)</sup>
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(2.11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(8.11)</sup>

นายพร ยศพรหม

ผู้อำนวยการ

ศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคตะวันออก

ดิน...

ดิน จำนวน 5 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Mercury	Digestion, Cold vapor Atomic Absorption Spectrometric Method <sup>(1.4)</sup>
2	Polychlorinated Biphenyls (PCBs)	Ultrasonic Extraction, Gas Chromatographic Method <sup>(8.16.17)</sup>
3	TPH (C <sub>5</sub> -C <sub>6</sub> )	Purge and Trap, Gas Chromatographic Mass Spectrometric Method <sup>(10.18)</sup>
4	TPH (C <sub>7</sub> -C <sub>10</sub> )	Ultrasonic Extraction, Gas Chromatographic Mass Spectrometric Method <sup>(10.18)</sup>
5	TPH (C <sub>10</sub> -C <sub>30</sub> )	Ultrasonic Extraction, Gas Chromatographic Mass Spectrometric Method <sup>(10.18)</sup>

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ผู้ชำนาญการ  
ศูนย์วิจัยและติดตามสิ่งแวดล้อมพิษวิทยา กรมโรงงานอุตสาหกรรม โทร ๐ ๕๐๖๔ ๗๖๒๓



ที่ ฮก ๐๑๓๐(๓)/ ๔๖ ๖ ๐ ๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ เขตราชเทวี  
กรุงเทพมหานคร ๑๐๕๐๐

๒๕ มีนาคม ๒๕๖๓

เรื่อง คอยูทูนังเลื่อรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
เรียน กรรมการผู้ทรงคุณวุฒิ เอสซีเอส (ประเทศไทย) จำกัด  
อ้างถึง คำขอขึ้นทะเบียน/คอยูทูนังเลื่อคอยูทูนังเลื่อรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๑ กันยายน ๒๕๖๒

สิ่งที่ส่งมาด้วย เอกสารแบบท้ายหนังสือรับคอยูทูนังเลื่อรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอสซีเอส (ประเทศไทย) จำกัด จำนวน ๑๗ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอสซีเอส (ประเทศไทย) จำกัด คอยูทูนังเลื่อรับ  
ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๓๗ สถานที่ตั้งเลขที่ ๑/๒๐๔ และ ๑/๒๑๑  
หมู่ที่ ๑ ตำบลบ้านดง อำเภอบ้านดง จังหวัดระยอง คอยูทูนังเลื่อรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอสซีเอส (ประเทศไทย) จำกัด คอยูทูนังเลื่อรับ  
ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยออกใบประกาศนียบัตร

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวสายใจ เรืองสวัสดิ์
- ๒) นางสาวพรนภา สมจิตต์
- ๓) นายธวัช ศิริใจดี
- ๔) นายภาณุกร สุทธิวิภา
- ๕) นายเทพสัน อนุภา

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวปวีณา พิมพ์
- ๒) นางสาวนิภากร ปิติโชติชัย
- ๓) นายกรีน เลี้ยงงาม
- ๔) นายศุภกร กลิ่นเกษร
- ๕) นายวัชรวิทย์ สัมจิ
- ๖) นายศุภฤกษ์ คล่องเจริญกิจ
- ๗) นางสาวพนิดา วรรณบุตร
- ๘) นายสุรศักดิ์ อุบล
- ๙) นายสมบ่ง เกตุพนท
- ๑๐) นายณวัฒน์ ชัยสิทธิ์
- ๑๑) นายวิจิตร ทรัพย์ดี

๑๒) นายอนันต์กร...



- ๑๒) นายอนันต์กร นันทแสง  
๑๓) นายณัฐพล ตาปราบ  
๑๔) นายเฉลิมวุฒิ คูนิคม  
๑๕) นายกรวิทย์ มาลากร ณ อุทยาน  
๑๖) นายวีระเดช คงมร  
๑๗) นายวิบูลย์ ทองลาด  
๑๘) นายพิสันต์ ศรีรักษาบุญ  
๑๙) นายเบ็ญจมาภรณ์ เกษม  
๒๐) นางสาวอนัญญา ไชยะง  
๒๑) นายสาธิต ทองวงศ์ญาติ  
๒๒) นายศุภชัย พิลาประเสริฐ  
๒๓) นายปริญญ์ ทัพยัต  
๒๔) นายชัชวาล รื่นมหาย  
๒๕) นายชัยชัย กิตติพิทักษ์กุล  
๒๖) นายวิฑิต พงษ์วิชัย  
๒๗) นางสาวนันทิยา ชุมทอง  
๒๘) นางสาวอนัญญา วงศ์คง  
๒๙) นางสาวสุภาภา เกตุทองแสง

ค. ขอบข่ายสารมลพิษที่ได้รับทะเบียนไว้ในรายชื่อ จำนวน ๑๓ รายการ และสิ้น จำนวน ๑๗ รายการ รวมทั้งสิ้นจำนวน ๒๐๔ รายการ ตามที่ส่งมาด้วย

หนังสือฉบับนี้จะมีผลตั้งแต่วันที่ ๑๒ ตุลาคม ๒๕๖๕ หากประสงค์จะส่งรายชื่อรับขึ้นทะเบียนหรือปฏิบัติภารกิจราชการให้ยื่นคำขอต่อผู้อำนวยการประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือรับขึ้นทะเบียนหรือปฏิบัติภารกิจราชการ

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



อธิบดีกรมโรงงานอุตสาหกรรม  
ผู้แทนกรมโรงงานอุตสาหกรรม  
ผู้ปฏิบัติงานระดับต้นโรงงานอุตสาหกรรม

กองวิจัยและพัฒนายุทธศาสตร์  
ศูนย์วิจัยและพัฒนายุทธศาสตร์โรงงานภาคตะวันออก  
โทร. ๐ ๓๘๐๕ ๙๖๖๓-๓  
โทรสาร ๐ ๓๘๐๕ ๙๖๖๓

เอกสารแนบท้ายหนังสือรับข้อบัญญัติระเบียบข้อปฏิบัติภารกิจราชการ  
บริษัท เอสซีเอส (ประเทศไทย) จำกัด  
ที่ อภ ๐๓๐๐(๓)/ ๕ ๖ ๐ 4  
เลขทะเบียน 7-๑๙๗  
ลงวันที่ ๒๕ มีนาคม ๒๕๖๕

ขอขำขามสารมลพิษที่ได้รับทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๐๔ รายการ  
นับเป็น จำนวน 21 รายการ

ลำดับที่	ชนิดสารมลพิษ	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
2	Barium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
3	Biochemical Oxygen Demand	5-Day BOD Test, Membrane Electrode Method <sup>(1)</sup>
4	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
5	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>(1)</sup>
6	Color	ADMI Weighted - Ordinate Spectrophotometric Method <sup>(1)</sup>
7	Copper	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
8	Hexavalent Chromium	Filtration, Colorimetric Method <sup>(1)</sup>
9	Lead	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
10	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
11	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
12	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>(1)</sup>
13	pH	Electrometric Method <sup>(1)</sup>
14	Phenols	Distillation, Direct Photometric Method <sup>(1)</sup>
15	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
16	Total Chromium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
17	Total Dissolved Solids	Dried at 180 °C <sup>(1)</sup>
18	Total Kjeldahl Nitrogen	Digestion, Distillation, Titrimetric Method <sup>(1)</sup>
19	Total Suspended Solids	Dried at 103-105 °C <sup>(1)</sup>
20	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method, Calculation <sup>(1)</sup>
21	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

เอกสารแนบ (ปล่องระบาย) จำนวน 13 รายการ

ลำดับที่	ชนิดสารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
3	Chlorine	Isokinetic Sampling, Ion Chromatographic Method <sup>(1)</sup>

ภาคผนวก (ต่อเนื่อง) จำนวน 13 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีตรวจหา
4	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
5	Dioxin/Furans	Isokinetic Sampling, Analysis by Accredited Laboratory <sup>[2]</sup>
6	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method <sup>[3]</sup>
7	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[2]</sup>
8	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[2]</sup>
9	Mercury	Isokinetic Sampling, Digestion, Cold Vapour Atomic Absorption Spectroscopy <sup>[2]</sup>
10	Oxides of Nitrogen	Chemical Absorption, Colorimetric Method <sup>[2]</sup>
11	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[2]</sup>
12	Sulfur Dioxide	Chemical Absorption, Barium - Thorin Titrimetric Method <sup>[2]</sup>
13	Sulfuric Acid	Isokinetic Sampling, Barium - Thorin Titrimetric Method <sup>[2]</sup>

ภาคผนวก จำนวน 118 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีตรวจหา
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
9	Benzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
10	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
18	Bis(2-Ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
21	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
22	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
23	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>

ภาคผนวก จำนวน 118 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีตรวจหา
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
2	Acetone	Purge and Trap Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
6	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>[1]</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[1]</sup>

(เอกสารนี้เป็นเอกสารตัวอย่าง)

นักวิทยาศาสตร์ชำนาญการ ทำหน้าที่แทน

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

8 Barium...

นักวิทยาศาสตร์ชำนาญการ ทำหน้าที่แทน

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

26 Chlordane...



น้ำใต้ดิน จำนวน 118 รายการ

ลำดับที่	ชนิดสารเคมี	วิธีวิเคราะห์
26	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
27	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
31	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
32	Chromium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
33	Chromium Hexavalent	Filtration, Colorimetric Method <sup>(1)</sup>
34	Chromium Trivalent	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation <sup>(1)</sup>
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
36	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
37	DDD	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
38	DDE	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
39	DDT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
40	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
41	Di-n-Butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
42	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

นักวิทยาศาสตร์ชำนาญการ หัวหน้าทีม

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคตะวันออก

43 1,3-Dichlorobenzene ...

น้ำใต้ดิน จำนวน 118 รายการ

ลำดับที่	ชนิดสารเคมี	วิธีวิเคราะห์
43	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
44	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
45	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
46	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
47	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
48	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
49	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
50	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
51	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
52	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
53	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
54	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
55	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
56	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
57	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
58	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

นักวิทยาศาสตร์ชำนาญการ หัวหน้าทีม

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคตะวันออก

59 2,4-Dinitrotoluene...



ลำดับที่	ชนิดสารพิษ	วิธีวิเคราะห์
59	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
60	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
61	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
62	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
63	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
64	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
65	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
66	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
67	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
68	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
69	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
70	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
71	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
72	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
73	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
74	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

มหาวิทยาลัยราชภัฏรำไพพรรณี

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงพยาบาลระนอง

75 Hexachloroethane...

ลำดับที่	ชนิดสารพิษ	วิธีวิเคราะห์
75	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
76	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
77	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
78	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
79	Lead	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
80	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
81	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
82	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
83	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
84	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
85	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
86	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
87	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
88	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
89	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
90	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
91	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
92	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

มหาวิทยาลัยราชภัฏรำไพพรรณี

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงพยาบาลระนอง

93 pH...

น้ำได้ดิบ จำนวน 118 รายการ

ลำดับที่	ชนิดสารเคมี	วิธีวิเคราะห์
93	pH	Electrometric Method <sup>(1)</sup>
94	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
95	Phenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
96	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
97	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
98	Silver	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
99	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
100	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
101	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
102	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
103	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
104	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
105	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
106	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
107	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
108	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
109	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>

นักวิทยาศาสตร์ชำนาญการ จ่าหน้าแทน

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษทางอากาศและน้ำ

110 1,3,5-Trimethylbenzene...

น้ำได้ดิบ จำนวน 118 รายการ

ลำดับที่	ชนิดสารเคมี	วิธีวิเคราะห์
110	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
111	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>
112	Vinyl acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
113	Vinyl chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
114	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
115	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
116	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
117	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(1)</sup>
118	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(1)</sup>

ดิน จำนวน 117 รายการ

ลำดับที่	ชนิดสารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
3	Aldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
4	Anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Method <sup>(6,7)</sup>
6	Arsenic	Digestion, Inductively Coupled Plasma Method <sup>(6,7)</sup>
7	Atrazine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>

นักวิทยาศาสตร์ชำนาญการ จ่าหน้าแทน  
ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษทางอากาศและน้ำ

8 Barium...



สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีการหา
8	Barium	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
9	Benz(a)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
10	Benzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
11	Benzobifluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
12	Benzobifluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
13	Benzoic acid	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
14	Benzofluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
15	Benzofluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
17	Bis(2-Chloroethyl)ether	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
18	Bis(2-Ethylhexyl)phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
21	Butyl benzyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
22	Cadmium	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
23	Carbazole	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>

นักวิทยาศาสตร์ชำนาญการ ทำหน้าที่แทน

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

26 Chlordane...

สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีการหา
26	Chlordane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
27	p-Chloroaniline	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
31	2-Chlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
32	Chromium	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
33	Chromium (III)	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation <sup>(4,5,7)</sup>
34	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(5)</sup>
35	Chrysene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
36	2,4-D	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
37	DDD	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
38	DDE	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
39	DDT	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
40	Dibenz(a,h)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
41	Di-n-Butyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
42	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
43	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>

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ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

44 1,4-Dichlorobenzene...



สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีตรวจหา
44	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
45	3,3-Dichlorobenzidine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
46	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
47	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
48	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
49	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
50	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
51	2,4-Dichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
52	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
53	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
54	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
55	Dieldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
56	Diethyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
57	2,4-Dimethylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
58	2,4-Dinitrophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
59	2,4-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>

นักวิทยาศาสตร์ชำนาญการ ทำหน้าที่แทน

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษจากภาคตะวันออก

60 2,6-Dinitrotoluene...

สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีตรวจหา
60	2,6-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
61	Di-n-octyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
62	Endosulfan	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
63	Endrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
64	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
65	Fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
66	Fluorene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
67	Heptachlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
68	Heptachlor epoxide	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
69	Hexachlorobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
70	Hexachloro-1,3-butadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
71	$\alpha$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
72	$\beta$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
73	$\gamma$ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
74	Hexachlorocyclopentadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>
75	Hexachloroethane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(a),(b)</sup>

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ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษจากภาคตะวันออก

76 n-Hexane...

สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีวิเคราะห์
76	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
77	Indeno(1,2,3-cd)pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
78	Isophorone	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
79	Lead	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
80	Manganese	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
81	Methoxychlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
82	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
83	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
84	2-Methylnaphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
85	2-Methylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
86	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
87	Naphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
88	Nickel	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
89	Nitrobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
90	N-Nitrosodiphenylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
91	N-Nitrosodi-n-propylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
92	Pentachlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>

นักวิทยาศาสตร์ชำนาญการ หัวหน้าแผน

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคตะวันออก

93 Phenanthrene...

สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีวิเคราะห์
93	Phenanthrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
94	Phenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
95	Pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
96	Selenium	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
97	Silver	Digestion, Inductively Coupled Plasma Method <sup>(4,7)</sup>
98	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
99	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
100	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
101	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
102	Toxaphene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
103	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
104	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
105	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
106	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
107	2,4,5-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
108	2,4,6-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>(9,10)</sup>
109	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>

นักวิทยาศาสตร์ชำนาญการ หัวหน้าแผน

ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคตะวันออก 110 Vanadium...

สืบ จำนวน 117 รายการ

ลำดับที่	ชนิดสารพิษ	วิธีการหา
110	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>(6,7)</sup>
111	Vinyl Acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
112	Vinyl Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
113	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
114	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
115	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
116	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method <sup>(6,8)</sup>
117	Zinc	Digestion, Inductively Coupled Plasma Method <sup>(6,7)</sup>

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ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

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ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กองวิจัยและเตือนภัยมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร ๐ ๓๖๐๕ ๓๖๖๓-๓



# ABS Quality Evaluations

## Certificate Of Conformance

This is to certify that the Quality Management System of:

**SGS (Thailand) Ltd.**

**100 Nanglinchee Road, Chongnonsee, Yannawa,  
Bangkok 10120  
Thailand**

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

**ISO 9001:2015**

The Quality Management System is applicable to:

### PROVISION OF PHYSICAL INSPECTION, FUMIGATION, PEST CONTROL AND LABORATORY TESTING AND CALIBRATION

This certificate may be found on the ABS QE Website ([www.abs-qe.com](http://www.abs-qe.com)). For certificates issued in the People's Republic of China information may also be verified on the CNCA website ([www.cnca.gov.cn](http://www.cnca.gov.cn)).

Certificate No: 52228  
Certification Date: 30 July 2015  
Effective Date: 23 July 2020  
Expiration Date: 24 July 2023  
Revision Date: 23 July 2020

Dominic Townsend, President



Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 1701 City Plaza Drive, Spring, TX 77589, U.S.A.  
Validity of this certificate may be confirmed at [www.abs-qe.com/cert](http://www.abs-qe.com/cert)

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# ABS Quality Evaluations

ISO 9001:2015

## Certificate Of Conformance

**ANNEX**

Certificate No. 52228

### SGS (Thailand) Ltd.

At Below Facilities:

Facility	Facility 1 - Rayong Branch 10205 and 10211 Moo 1 T. Ban Chang Rayong 21130 Thailand	Facility	Facility 2 - Sracha Office 144, 146 Srachakulom 1 Road, T. Srachak A. Srachua, Chonburi 20110 Thailand
Activity	Inspection & Testing	Activity	Inspection, Fumigation & Pest Control
Facility	Facility 3 - Nakornchaisri Office 130/146 Surasarak Road, T. Nua Muang A. Muang Nakornchaisri, 30000 Thailand	Facility	Facility 4 - Light Tag Branch 57, 59 and 61 Soi 30 Petchkasem Road, T. Hat Yai, A. Hat Yai Songkhlo 90110 Thailand
Activity	Inspection & Fumigation	Activity	Inspection, Fumigation, Pest Control & Testing
Facility	Facility 5 - Rama III Branch, Laboratory Services 4116 - 20, 4103 Rama III Road So-28, Chongnonsri, Yarnawa Bangkok 10120 Thailand	Facility	Facility 6 - SGS (Cambodia) Limited No. 1078 A-1 Street 371 Phnom Penh II Sangkat Sreng Meanchey Khan Meanchey, Phnom Penh Cambodia
Activity	Testing	Activity	Inspection



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แบบ กข.ก/กข.ก  
Form NSC/TH 2

ใบรับรองเลขที่ 22-80007  
(Certificate No.)

## ใบรับรองระบบงาน (Certificate of Accreditation)

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

เลขชื่อกิจการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
(Secretary-General, Thai Industrial Standards Institute)

ออกใบรับรองฉบับนี้ให้  
(Issue this certificate to)

บริษัท เอสจีเอส (ประเทศไทย) จำกัด  
SGS (Thailand) Limited

ตั้งอยู่เลขที่  
(Address)

๑๐๐ ถนนนางลิ้นจี่ แขวงคลองนารายณ์ เขตยานนาวา กรุงเทพมหานคร  
(100 Nanglijee Road, Chongnonsiri, Yananawa, Bangkok)

ได้รับการรับรองความสามารถ  
(Certificate of competence)

ตามมาตรฐานเลขที่ มอก. ๑๙๐๒๐ - ๒๕๕๖  
(Standard No. ISO/IEC 17020 : 2012)

การตรวจสอบและรับรอง-ข้อกำหนดสำหรับหน่วยตรวจ  
(Conformity assessment - Requirements for the operation of various types of bodies performing inspection)

หมายเลขการรับรองที่ หน่วยตรวจ ๐๐๓๔  
(Accreditation No. NSP/CTC01 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))

รองเลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
ปฏิบัติราชการแทน

เลขชื่อกิจการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
Ministry of Industry Thailand, Thai Industrial Standards Institute



## รายละเอียดแบบยื่นใบรับรองระบบงานหน่วยตรวจ ใบรับรองเลขที่ 22-800007

ชื่อหน่วยตรวจ : บริษัท เอสจีเอส (ประเทศไทย) จำกัด

ที่ตั้งสถานประกอบการของหน่วยตรวจและข้อมูลติดต่อ  
ที่ตั้งสำนักงานใหญ่

เลขที่ 100 ถนนนางลิ้นจี่ แขวงคลองนารายณ์ เขตยานนาวา  
กรุงเทพมหานคร

ที่ตั้งสำนักงานสาขา (กรณีมีหลายสาขาที่ตั้งสำนักงานใหญ่)

1) สำนักงานศรีราชา

เลขที่ 144-146 ถนนศรีราชา 1 ตำบลศรีราชา อำเภอศรีราชา  
จังหวัดชลบุรี

2) สำนักงานนครราชสีมา

เลขที่ 1340/46 ถนนสุรนารายณ์ ตำบลในเมือง อำเภอเมือง  
จังหวัดนครราชสีมา

3) สาขาหาดใหญ่

เลขที่ 57, 59, 61 ซอย 10 ถนนเพชรเกษม ตำบลหาดใหญ่  
อำเภอหาดใหญ่ จังหวัดสงขลา

หมายเลขการรับรอง : หน่วยตรวจ 0034  
ประเภทของหน่วยตรวจ : ประเภท A

หมวดหมู่ / สาขาการตรวจ	ขั้นตอนและช่วงการตรวจ	ข้อกำหนดที่ใช้
1. เครื่องเล่นกาย : เมื่อทำสำเร็จรูป (เฉพาะสำนักงานใหญ่)	การตรวจสอบการผลิตและการตรวจสอบก่อน ส่งมอบ ใบรายการต่อไปนี้ - ลักษณะทั่วไป - รูปแบบและขนาด - ปริมาณและการบรรจุ (เฉพาะการ ตรวจสอบการส่งมอบ) ตรวจสอบก่อนการส่งมอบ	- วิธีปฏิบัติงานของบริษัทหมายเลข P-NSP-WI-SL-001 - ข้อกำหนดของลูกค้า
2. เครื่องเล่นกาย : การตรวจสอบชิ้นส่วน (เฉพาะสำนักงานใหญ่และ สาขาหาดใหญ่)	การตรวจระบบการกลั่นและการตรวจสอบก่อน การส่งมอบ สำหรับกลุ่มผลิตภัณฑ์อาหารทะเล แห้งและกลุ่มผลิตภัณฑ์อาหารทะเลปรุง	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข P-CORP-1-09 - ข้อกำหนดของลูกค้า
3. ยานยนต์ : รถยนต์ (เฉพาะสำนักงานใหญ่)	การตรวจสภาพที่ไม่ผ่านการซ่อมใน รายการต่อไปนี้ - จำนวน - สภาพความสมบูรณ์ภายนอกของ รถยนต์ เช่น สภาพของกระด ช่าง พ่วงของตัวถัง สภาพภายในและ ความสะอาด และอื่น ๆ ที่เกี่ยวข้อง	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-NR-OGC-IN-001 และ PR-TH-NR-OGC-IN-002 - เลกการ New Vehicle Receiving and Inspection Procedures Issued May 1, 1989 ของ Federal Chamber of Automotive Industries

ออกให้ครั้งแรกเมื่อวันที่ 11 กันยายน พ.ศ. 2561  
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแบบท้ายใบรับรองระบบงานหน่วยตรวจ  
ใบรับรองเลขที่ 22-IB0007

ชื่อหน่วยตรวจ : บริษัท เอสซีเอส (ประเทศไทย) จำกัด  
หมายเลขการรับรอง : หน่วยตรวจ 0034  
ประเภทของหน่วยตรวจ : ประเภท A



หมวดหมู่ / สาขาการตรวจ	ขั้นตอนและช่วงการตรวจ	ข้อกำหนดที่ใช้
4. เครื่องจักรกล : อิเล็กทรอนิกส์โครงสร้างเหล็ก (เฉพาะสำนักงานใหญ่)	การตรวจกระบวนการผลิตและการควบคุมคุณภาพ ในรายการต่อไปนี้ - การตรวจชิ้นส่วนประกอบกลึง - การตรวจกระบวนการประกอบ - การทดสอบทั้งพยางค์ การรับ การขยายตัวและการกระเบิด และการตรวจสอบปริมาตร - การตรวจสอบก่อนการส่งมอบ	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-SF-IN-071 - ข้อกำหนดของลูกค้า
5. สินค้าเกษตร : ข้าวหอมมะลิไทย (เฉพาะสำนักงานใหญ่และสำนักงานนครราชสีมา)	การตรวจใบแจ้งตรวจปล่อย ในรายการต่อไปนี้ - ปริมาณ - คุณภาพทางกายภาพและลักษณะทั่วไป ดังต่อไปนี้ • ประเภท ชนิด • ความบริสุทธิ์ • ความชื้น • ขนาดของเมล็ดข้าว • ส่วนผสม (ข้าวขึ้นเมล็ด ข้าวหัก ต้นข้าว) • ข้าวและสิ่งที่ยังปะปนได้ (เมล็ดเสีย เมล็ดเปลือก เมล็ดท้องไร่ เมล็ดแดง ฯลฯ) • ไม่มีแมลงที่ยังมีชีวิต • วัสดุการขัดสี ไม่ครอบคลุมการตรวจความบริสุทธิ์ด้วยวิธีวิเคราะห์ในห้องปฏิบัติการในรายการ ปริมาณเอนไซม์ (Amylase content) และค่าการละลายเมล็ดข้าวในด่าง (Alkali spreading value)	- ประกาศกระทรวงพาณิชย์ เรื่อง หลักเกณฑ์และวิธีการจัดการให้มีการตรวจสอบมาตรฐานสินค้าและการตรวจสอบมาตรฐานสินค้าข้าวหอมมะลิไทย - ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-NR-AGR-IN-004 และ PR-TH-NR-AGR-IN-005 - ข้อกำหนดของลูกค้า

รายละเอียดแบบท้ายใบรับรองระบบงานหน่วยตรวจ  
ใบรับรองเลขที่ 22-IB0007

ชื่อหน่วยตรวจ : บริษัท เอสซีเอส (ประเทศไทย) จำกัด  
หมายเลขการรับรอง : หน่วยตรวจ 0034  
ประเภทของหน่วยตรวจ : ประเภท A



หมวดหมู่ / สาขาการตรวจ	ขั้นตอนและช่วงการตรวจ	ข้อกำหนดที่ใช้
6. สินค้าเกษตร : น้ำตาลทรายขาวและน้ำตาลทรายดิบ (เฉพาะสำนักงานใหญ่และสำนักงานนครราชสีมา)	การตรวจลักษณะทั่วไปและปริมาณ น้ำตาลทรายขาวและน้ำตาลทรายดิบ (เฉพาะสำนักงานใหญ่และสำนักงานนครราชสีมา)	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-NR-AGR-IN-002 และ PR-TH-NR-AGR-IN-003 - ข้อกำหนดของลูกค้า
7. สินค้าเกษตร : ถั่วลิสง ขึ้นฉิม พันธุ์ดี ทั้งดิบ และหั่นก่อน (เฉพาะสำนักงานใหญ่ สำนักงานศรีราชา และสาขาหาดใหญ่)	การตรวจสภาพทั่วไปและการสุ่มตัวอย่าง	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-NR-MIN-IN-001 และ PR-TH-NR-MIN-IN-002
8. การตรวจโรงงานเพื่อการรับรองคุณภาพผลิตภัณฑ์ (เฉพาะสำนักงานใหญ่)	การตรวจระบบการผลิต ระบบคุณภาพ และการตรวจประเมินผลิตภัณฑ์ สำหรับกลุ่มผลิตภัณฑ์ ดังต่อไปนี้ - วัสดุก่อสร้าง คอนกรีต สุขภัณฑ์ เซรามิก และเครื่องเรือน - บริเวณที่ก่อสร้าง - ไฟฟ้ากำลัง - เครื่องใช้ไฟฟ้า - เครื่องใช้อิเล็กทรอนิกส์ - วัสดุก่อสร้าง และของเล่น - ยาง เคมี สิ่งทอ ปิโตรเลียม และอาหาร - ยานยนต์ ชิ้นส่วนยานยนต์ และเครื่องจักร	- หลักเกณฑ์การตรวจสอบเพื่อการอนุญาตของสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม - หลักเกณฑ์เฉพาะในการตรวจตรวจสอบเพื่อการอนุญาตผลิตภัณฑ์ที่เกี่ยวข้อง และมาตรฐานผลิตภัณฑ์อุตสาหกรรมที่เกี่ยวข้อง - เอสเอ็มอีระบบการดำเนินงานของบริษัท หมายเลข THLPP-01





รายละเอียดแบบท้ายใบรับรองระบบงานหน่วยตรวจ  
ใบรับรองเลขที่ 22-IB0007

ชื่อหน่วยตรวจ : บริษัท เอสจีเอส (ประเทศไทย) จำกัด  
หมายเลขการรับรอง : หน่วยตรวจ 0034  
ประเภทของหน่วยตรวจ : ประเภท A

หมวดหมู่ / สาขาการตรวจ	ขั้นตอนและช่วงการตรวจ	ข้อกำหนดที่ใช้
9. สิ่งแวดล้อม (เฉพาะสำนักงานใหญ่)	การตรวจคุณภาพสิ่งแวดล้อมภายในอาคาร ในรายการต่อไปนี้ - ระดับเสียง - ความร้อนสะสม - ปริมาณ CO, CO <sub>2</sub> , PM <sub>10</sub> , Ozone, Total VOCs - อุณหภูมิ - ความชื้นสัมพัทธ์ - ความเร็วลม - ระดับความเข้มแสง	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-ISE-IN-035, PR-TH-ISE-IN-036, PR-TH-ISE-IN-038, PR-TH-ISE-IN-050, PR-TH-ISE-IN-051, PR-TH-ISE-IN-052, PR-TH-ISE-IN-054 และ PR-TH-ISE-IN-055 - ข้อกำหนดของลูกค้า - กฎหมาย กฎและระเบียบต่าง ๆ ที่เกี่ยวข้อง
	การตรวจคุณภาพสิ่งแวดล้อมภายนอกอาคาร ในรายการต่อไปนี้ - ระบบการตรวจสอบคุณภาพอากาศจากปล่องแบบอัตโนมัติอย่างต่อเนื่อง (Continuous Emission Monitoring Systems : CEMS) ด้วยเครื่องมือหรือเครื่องอุปกรณ์พิเศษ (ปริมาณ CO, SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> , CO <sub>2</sub> , NO และ NO <sub>x</sub> )	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-ISE-IN-015 และ PR-TH-ISE-IN-032 - ข้อกำหนดของลูกค้า - กฎหมาย กฎและระเบียบต่าง ๆ ที่เกี่ยวข้อง
	การตรวจคุณภาพน้ำ ในรายการ - การเก็บตัวอย่างน้ำ - ลักษณะทางกายภาพ (สี กลิ่น รส) - ความเป็นกรด-ด่าง - อุณหภูมิ - ปริมาณออกซิเจนที่ละลายน้ำ (Dissolved Oxygen : DO) - ค่าการนำไฟฟ้า - ค่าความเค็ม - ค่าความขุ่น ทั้งนี้ไม่รวมส่วนวิเคราะห์ในห้องปฏิบัติการ	- ขั้นตอนการดำเนินงานของบริษัท หมายเลข PR-TH-ISE-IN-043 - ข้อกำหนดของลูกค้า - กฎหมาย กฎและระเบียบต่าง ๆ ที่เกี่ยวข้อง

ออกให้ครั้งแรกเมื่อวันที่ 11 กันยายน พ.ศ. 2561  
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หน้าที่ 4/5



รายละเอียดแบบท้ายใบรับรองระบบงานหน่วยตรวจ  
ใบรับรองเลขที่ 22-IB0007

ชื่อหน่วยตรวจ : บริษัท เอสจีเอส (ประเทศไทย) จำกัด  
หมายเลขการรับรอง : หน่วยตรวจ 0034  
ประเภทของหน่วยตรวจ : ประเภท A

หมวดหมู่ / สาขาการตรวจ	ขั้นตอนและช่วงการตรวจ	ข้อกำหนดที่ใช้
10. สิ่งแวดล้อม : ข้าวสารและกากธัญพืช* (เฉพาะสำนักงานใหญ่และสำนักงานสาขา)	การตรวจสอบสภาพทั่วไป การสุ่มตัวอย่าง และการส่งผลการตรวจขึ้นกับนัก	- GATA Weighing Rules No. 123 - GATA Sampling Rules No.124 - วิธีปฏิบัติงานของบริษัทหมายเลข PR-TH-NR-AGR-IN-006 - ข้อกำหนดของลูกค้า

หมายเหตุ : \* สาขาและสถานที่ได้รับการรับรองระบบงานเพิ่มเติม วันที่ 8 ธันวาคม 2564

ตั้งแต่ วันที่ 8 ธันวาคม พ.ศ. 2564  
ถึง วันที่ 10 กันยายน พ.ศ. 2569  
ออกให้ ณ วันที่ 31 มกราคม พ.ศ. 2565

ออกให้ครั้งแรกเมื่อวันที่ 11 กันยายน พ.ศ. 2561  
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หน้าที่ 5/5

Scope of Accreditation for Inspection Body  
Certificate No. 22-IB0007



**Name of Inspection Body :** SGS (Thailand) Limited  
**Addresses and contact details**  
**Head office or primary location**  
100 Nanglaenue Road, Chongnonsue, Yarnawa, Bangkok  
**Additional Locations (if different from Head Office)**  
1) Sriracha Office  
144, 146 Sriracha Nakhon 1 Road, Sriracha, Sriracha, Chonburi  
2) Nakhon Ratchasima Office  
1340/46 Suramarai Road, Nai-Muang, Muang, Nakhonratchasima  
3) Hat Yai Branch  
57, 59 and 61 Soi 10, Phetkasem Road, Hat Yai, Hat Yai, Songkhla  
**Accreditation No. :** INSPECTION 0034  
**Type of Inspection Body :** Type A

Category / Field of Inspection	Stage and Range of Inspection	Inspection Requirements or Criteria
1. Apparel : Readymade Garment (Head office)	In-line process and Pre-shipment inspection of readymade garment with the items as follows : - General appearance - Style, Size and Weight of unit - Quantity and Packing (Pre-shipment inspection)	- Work instruction of SGS (Thailand) Limited : P-INSR-WI-SL-001 - Customer's requirements
2. Food Products : Food Inspection (Head Office and Hat Yai Branch)	During process inspection and Pre-shipment inspection of food products covering frozen food products and canned food products	- Operating procedure of SGS (Thailand) Limited : P-CORP-H09 - Customer's requirements
3. Motor Vehicle : Automotive (Head Office)	Pre-shipment inspection of general condition of vehicle with the items as follows : - Quantity - Visual inspection of external condition e.g. glass, body, tires, wheels, cleanliness etc.	- Operating procedure of SGS (Thailand) Limited : PR-TH-NR-OGC-IN-001 and PR-TH-NR-OGC-IN-002 - New Vehicle Receiving and Inspection Procedures Issued May 1, 1989 of Federal Chamber of Automotive Industries

Scope of Accreditation for Inspection Body  
Certificate No. 22-IB0007



**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 - During assembly - Heat treatment - Mechanical, Hydraulic pressure leak, Volumetric expansion, Burst test and Capacity check - Pre-delivery inspection	- Operating procedure of SGS (Thailand) Limited : PR-TH-GE-IN-071 - Customer's requirements
5. Agricultural Products : Thai Hom Mali Rice (Head Office and Nakhon Ratchasima Office)	Pre-shipment inspection with the items as follows : - Quantity - Physical quality and general feature as follows : • Type, Grade • Purity • Moisture • Kernel size • Composition (whole kernel, broken, head rice) • Rice and matters that may be present (damaged kernel, yellow kernel, chalky kernel, red kernel, etc.) • No live insects • Milling degree Not covering the purity check by laboratory analysis for determination of Amylose content and Alkali spreading value	- Notification of Ministry of Commerce on Criteria and procedures of organizing the inspection of commodity standards and the inspection of the standards of Thai Hom Mali Rice - Operating procedure of SGS (Thailand) Limited : PR-TH-NR-AGR-IN-004 and PR-TH-NR-AGR-IN-005 - Customer's requirements

Scope of Accreditation for Inspection Body  
Certificate No. 22-IB0007



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
6. Agricultural Products : White sugar and raw sugar (Head Office and Nakhon Ratchasima Office)	General appearance and quantity inspection Excluding analysis by laboratory testing	<ul style="list-style-type: none"> <li>Operating procedure of SGS (Thailand) Limited : PR-TH-NR-AGR-IN-002 and PR-TH-NR-AGR-IN-003</li> <li>Customer's requirements</li> </ul>
7. Bulk Solids : Coal, cement, gypsum, clinker, limestone and sedimentary rock (Head Office, Sriracha Office and Hat Yai Branch)	General appearance inspection and sampling	<ul style="list-style-type: none"> <li>Operating procedure of SGS (Thailand) Limited : PR-TH-NR-MIN-IN-001 and PR-TH-NR-MIN-IN-002</li> </ul>
8. Manufacturing inspection for product certification (Head Office)	Production process and quality control system inspection including the evaluation of the following group of products : <ul style="list-style-type: none"> <li>Construction materials, concretes, sanitary wares, ceramics, and furniture</li> <li>Electrical lighting and similar equipment</li> <li>Electrical power devices</li> <li>Electrical appliances</li> <li>Electronic apparatus, parts, and components</li> <li>Consumer goods and toys</li> <li>Rubbers, chemicals, textiles, petroleum, and food products</li> <li>Automotive products, parts, and mechanical products</li> </ul>	<ul style="list-style-type: none"> <li>Criteria for product certification of Thai Industrial Standards Institute</li> <li>Criteria for the relevant particular requirements and Thai Industrial Standards for product certification</li> <li>Operating procedure of SGS (Thailand) Limited : THLPP.01</li> </ul>

Scope of Accreditation for Inspection Body  
Certificate No. 22-IB0007



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 : <ul style="list-style-type: none"> <li>Sound level</li> <li>Heat stress</li> <li>CO, CO<sub>2</sub>, PM-10, Ozone, Total VOCs</li> <li>Temperature</li> <li>Relative humidity</li> <li>Air velocity</li> <li>Light intensity</li> </ul>	<ul style="list-style-type: none"> <li>Operating procedure of SGS (Thailand) Limited : PR-TH-IE-IN-035, PR-TH-IE-IN-036, PR-TH-IE-IN-038, PR-TH-IE-IN-050, PR-TH-IE-IN-051, PR-TH-IE-IN-052, PR-TH-IE-IN-054, and PR-TH-IE-IN-055</li> <li>Customer's requirement</li> <li>Related laws and regulations</li> </ul>
	Outdoor Environment Inspection, the items as follows : <ul style="list-style-type: none"> <li>Continuous Emission Monitoring System : CEMS (CO, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, CO<sub>2</sub>, NO, and NO<sub>x</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>Operating procedure of SGS (Thailand) Limited : PR-TH-IE-IN-015 and PR-TH-IE-IN-032</li> <li>Customer's requirement</li> <li>Related laws and regulations</li> </ul>
	Water Inspection, the items as follows : <ul style="list-style-type: none"> <li>Water sampling</li> <li>Physical appearance (Color, Suspended Solids)</li> <li>pH</li> <li>Temperature</li> <li>Dissolved Oxygen : DO</li> <li>Conductivity</li> <li>Salinity</li> <li>Turbidity</li> </ul> Excludes laboratory analysis result	<ul style="list-style-type: none"> <li>Operating procedure of SGS (Thailand) Limited : PR-TH-IE-IN-043</li> <li>Customer's requirement</li> <li>Related laws and regulations</li> </ul>



Scope of Accreditation for Inspection Body  
Certificate No. 22-IB0007



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
10. Agricultural Products : Wheat and soybean meal* (Head Office and Sriracha Office)	General appearance inspection, Sampling, and weighing observation	<ul style="list-style-type: none"> <li>- GAFTA Weighing Rules No. 123</li> <li>- GAFTA Sampling Rules No.124</li> <li>- Operating procedure of SGS (Thailand) Limited : PR-TIH-NR-AGR-IN-006</li> <li>- Customer's requirement </li> </ul>

Note: \* Extent scope: 8 December B.E. 2564 (2021)

Valid from : 8 December B.E. 2564 (2021)  
Until : 10 September B.E. 2569 (2026)  
Issue Date : 31 January B.E. 2565 (2022)

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ภาคผนวก ค

สำเนาใบรับรองการสอบเทียบเครื่องมือตรวจวัด

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# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 30 June, 2022 Certification No. 250/22

Page : 1 of 6

Object : Precision Weather Station  
 Manufacturer : Davis Instruments  
 Type : Vantage Pro 2 Model No. : 6152C  
 Mfg Code : Display AM140127068 Transmitter AK130716013  
 Customer : SGS (Thailand) Limited.  
 100 Nanglinchee Road, Chongnonsi,  
 Yama, Bangkok 10120.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1005.6 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 SN 91563

: HOOK GAGE NO 1425 : Wind Aloft Plotting Board

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629566)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 0 - 20 m/sec

STANDARD THERMOMETER : Theodor Friedrich : Dry No.8390194 Wet No. 8369194

: Thermoschneider No.9188 : Testo 645 Serial No. 12548057

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB220 No. V1220016

(Authorized Signatory)

for the Chief  
 Sub-Standard Instrument

Mechanical Engineer

VERIFIED



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

Certification No. 250/22

Page : 2 of 6

30 June, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425		TESTED ANEMOMETER	
	Pressure mbar H2O	Vacuum mbar H2O	Velocity m/sec	Correction m/sec
1.00	-	-	0.9	0.10
3.02	-	-	3.1	-0.08
5.00	-	-	4.9	0.10
7.00	-	-	7.2	-0.20
9.02	-	-	8.9	0.12
11.01	-	-	11.2	-0.19
13.01	-	-	13.0	0.01
15.01	-	-	15.2	-0.19
17.02	-	-	17.0	0.02
20.02	-	-	19.3	0.72

Wind Aloft Plotting Board.	
US.DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270



Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

Certification No. 250/22

30 June, 2022

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
755.22	754.5	0.72
755.44	754.7	0.74
755.67	754.8	0.77
755.72	755.0	0.72
756.19	755.5	0.69
756.09	755.4	0.69
756.31	755.6	0.71
756.53	755.8	0.73
753.95	753.2	0.75
753.80	753.1	0.70
753.92	753.2	0.72
753.71	753.0	0.71
754.16	753.4	0.76
754.07	753.3	0.77
754.13	753.4	0.73
754.48	753.8	0.68
754.62	753.9	0.72
753.74	753.0	0.74
753.62	752.9	0.72
753.94	753.1	0.74
Average		0.73

Average



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

Certification No. 250/22

30 June, 2022

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.7	45.7	0.0
30.4	30.3	0.1
15.6	15.5	0.1



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



The Result of Calibration

Date of Issue 30 June, 2022

Certification No. 250/22

Page : 6 of 6

Certification No. 250/22

30 June, 2022

Page : 5 of 6

ใบรับรอง

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
85.20	86	-0.80
64.10	66	-1.90
45.20	44	1.20

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ชีฟต์ Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg. Code. AK130716013 ที่การสอบเทียบกันแก้ว  
ฝนแบบแก้ววง GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าถูกต้องตามรายละเอียดของ  
เครื่องมือ ( 0.01 in / TIP)



วิศวกรชำนาญการ



Mechanical Engineer

25122

THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 30 June, 2022 Certification No. 251/22

Page : 1 of 6

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Ventage Pro 2 Model No. : 6152C

Mfg Code : Display AZ170619028 Transmitter AZ170619022

Customer : SGS (Thailand) Limited.

100 Nanglinchee Road, Chongnonsi,  
Yamawa, Bangkok 10120.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1004.6 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 S/N 91563

: HOOK GAGE NO 1425 : Wind Aloft Plotting Board

N.I.S.T. Test Reference Number 731241400 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629566)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 0 - 20 m/sec

STANDARD THERMOMETER : Theodor Friedrich : Dry No.8390/94 Wet No. 8389/94

: Thermosneider No.9168 : Iso. Iso. Iso. No. 02846/57

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB270 No. V1220015-

(Authorized Signatory)

for the Chief  
Sub-Standard Instrument

Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

Certification No. 251/22

Page : 2 of 6

30 June, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425		TESTED ANEMOMETER	
	Pressure inches H2O	Vacuum inches H2O	Velocity m/sec	Correction m/sec
1.00	-	-	0.9	0.10
3.02	-	-	3.1	-0.08
5.00	-	-	4.9	0.10
7.00	-	-	7.2	-0.20
9.02	-	-	9.0	0.02
11.01	-	-	11.2	-0.19
13.01	-	-	13.0	0.01
15.01	-	-	15.2	-0.19
17.02	-	-	17.0	0.02
20.02	-	-	19.3	0.72

Wind Aloft Plotting Board.	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Ca

Mechanical Engineer







THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156,0-2399-0469

The Result of Calibration

30 June, 2022

Certification No. 251/22

Page : 3 of 6

Standard Barometer	Tested Barometer	Correction
Pressure	Pressure	
755.22	756.3	-1.08
755.44	756.5	-1.06
755.57	756.6	-1.03
755.72	756.7	-0.98
756.19	757.1	-0.91
756.09	757.2	-1.11
756.31	757.4	-1.09
756.53	757.7	-1.17
753.96	755.1	-1.15
753.80	754.9	-1.10
753.92	755.0	-1.08
753.71	754.9	-1.19
754.16	755.4	-1.24
754.07	755.2	-1.13
754.13	755.3	-1.17
754.48	755.7	-1.22
754.62	755.8	-1.16
753.74	754.9	-1.16
753.62	754.7	-1.08
753.84	755.0	-1.16
Average		-1.16

Average



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

The Result of Calibration

Certification No. 251/22

Page : 4 of 6

30 June, 2022

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.7	45.7	0.0
30.4	30.5	-0.1
15.6	15.5	0.1

Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

43553 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



Date of Issue 30 June, 2022

Certification No. 251/22

Page : 6 of 6

The Result of Calibration

30 June, 2022

Certification No. 251/22

Page : 5 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
95.20	87	-1.80
64.10	66	-1.90
45.20	46	-0.80

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ชีพหุ Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg. Code. AZ170619022 ทำการสอบเทียบกับแก้ว  
ฝนแบบแก้ววง GAUGE DIAMETER 8.0 INCHES , NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าถูกต้องตามรายละเอียดของ  
เครื่องมือ ( 0.01 in/ TIP)



วิศวกรชำนาญการ



Mechanical Engineer

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 20 January, 2022

Certification No. 018/22

Page : 1 of 6

VERIFIED

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Vantage Pro 2 Model No. : 6152C

Mfg Code : Display AZ170618031 Transmitter : AM140127056

Customer : SGS (Thailand) Limited

100 Nanglinchae Road, Chongnonsa,

Yannawa, Bangkok 10120.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1011.3 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 SN 91563

: HOOK GAGE NO 1425 : Wind Aboli Plotting Board

N.I.S.T. Test Reference Number 731/241460

: Ultrasonic Anemometer Model DA-650-3TV (Sensor TR-90AH)

Serial Number 110/30029 (Sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION

STANDARD THERMOMETER : Theodor Friedrich : Dry No.8350/94 Wet No. 8350/94

: Thermochneider No.9188

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB225 No. PT22017

Authorized Signatory

for the Chief  
Sub-Standard Test Unit

Mechanical Engineer

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



## The Result of Calibration

Certification No. 018/22

Page : 2 of 6

20 January, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure mbar (hPa)	Vacuum mbar (hPa)	Velocity m/sec	Velocity m/sec	Correction m/sec
1.00	-	-	-	0.4	0.60
3.02	-	-	-	2.7	0.32
5.00	-	-	-	4.5	0.50
7.00	-	-	-	6.7	0.30
9.02	-	-	-	8.5	0.52
11.01	-	-	-	10.7	0.31
13.01	-	-	-	12.5	0.51
15.01	-	-	-	14.8	0.21
17.02	-	-	-	16.5	0.52
20.02	-	-	-	19.3	0.72

Wind Aboli Plotting Board	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270



Meteorological Instruments Bureau

Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

20 January, 2022

Certification No. 018.22

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
760.50	761.3	-0.80
760.13	761.0	-0.87
760.87	761.5	-0.63
760.73	761.6	-0.87
757.28	758.1	-0.82
757.34	758.2	-0.86
757.52	758.4	-0.88
757.79	758.7	-0.91
758.10	759.0	-0.90
758.16	759.1	-0.94
758.06	759.5	-0.94
758.47	759.3	-0.83
758.56	759.4	-0.84
758.75	759.7	-0.95
758.98	759.9	-0.92
759.36	760.2	-0.84
758.54	757.4	-0.86
756.66	757.5	-0.84
757.00	757.9	-0.90
757.15	758.0	-0.85
Average		



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

Certification No. 018.22

Page : 4 of 6

20 January, 2022

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.2	0.0
30.4	30.4	0.0
15.1	15.2	-0.1



Mechanical Engineer





## THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-4469



Date of Issue 20 January, 2022

Certification No. 018/22

### The Result of Calibration

Certification No. 018/22

Page : 5 of 6

20 January, 2022

### ใบรับรอง

Page : 6 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
81.15	83	-1.85
60.23	64	-3.77
45.21	49	-3.79

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ยี่ห้อ Davis Instruments แบบ TIPPING  
BUCKET Product No. 6152 C Mfg No. AM140127096 ที่การสอบเทียบกับแก้ว  
ผ่านแบบแก้วตวง GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าจุดตั้งตามฐานและเอียงของ  
เครื่องมือ ( 0.01 in/ TIP)



Mechanical Engineer

วิศวกรชำนาญการ

Standard	Hook Gage No. 1425	TESTED ANEMOMETER		
		Pressure inches H <sub>2</sub> O	Vacuum inches H <sub>2</sub> O	Velocity m/sec
1.00	+	-	0.9	0.10
3.02	+	-	2.7	0.32
5.00	+	-	4.9	0.30
7.66	+	-	6.7	0.30
9.62	+	-	8.9	0.12
11.01	+	-	10.7	0.31
13.01	+	-	13.0	0.01
15.01	+	-	14.8	0.21
17.02	+	-	17.0	0.02
20.02	+	-	19.3	0.72

Wind Abut Piling Board.	
U.S. DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

4 March, 2022

Certification No. 090.22

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
759.10	760.3	-1.11
758.60	759.7	-1.10
758.47	759.6	-1.03
758.35	759.4	-1.05
758.08	759.1	-1.02
757.72	758.9	-1.08
757.55	758.6	-1.05
757.25	758.3	-1.05
757.07	758.1	-1.03
756.92	758.0	-1.08
756.45	757.5	-1.05
756.28	757.3	-1.02
755.61	760.7	-1.06
755.60	760.6	-0.91
756.76	760.7	-0.94
759.52	760.6	-1.08
759.35	760.4	-1.05
759.15	760.2	-1.05
758.99	760.0	-1.01
758.90	759.8	-1.00
759.9 Average		

759.9 Average



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

4 March, 2022

Certification No. 090.22

Page : 4 of 6

Standard Temp °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.4	45.3	0.1
30.2	30.2	0.0
15.3	15.3	0.0



Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804/0-2399-4468



Date of Issue : 4 March, 2022

Certification No. 090/22

Page : 6 of 6

The Result of Calibration

Certification No. 090/22

4 March, 2022

Page : 5 of 6

ใบรับรอง

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
93.53	91	2.53
92.12	89	0.12
45.62	44	1.62

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดความชื้น Davis Instruments แบบ TIPPING  
BUCKET Product No. 6152 C Mfg. Code, BD190415073 ที่ทำการสอบเทียบที่  
แผนกวิศวกรรม GAUGE DIAMETER 8.0 INCHES, NEGRETTE & ZAMBRA  
LONDON No 71082 และขนาดรอกไม่ใช้ได้ มีค่าคลาดเคลื่อนรวมเฉลี่ยคือ  
เพียง 0.01 in/TIP



Mechanical Engineer

วิศวกรชำนาญการ

# THAI METEOROLOGICAL DEPARTMENT



4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue 24 June 2021

Certification No. 323/21

Page : 1 of 6

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Vantage Pro 2 Model No. : 6152C

Mfg Code : Display BD190415079 Transmitter BD190415079

Customer : SGS (Thailand) Limited.  
100 Nanglinchee Road, Chongmonsi,  
Yannawa, Bangkok 10120.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1009.2 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 SIN 91563

: HOOK GAGE NO 1425 : Wind Anemometer Board

N.I.S.T. Test Reference Number 731241460

: Ultrasonic Anemometer Model DA-650-3TV (Sensor TR-90A4H)

Serial Number 110730029 (Sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION

STANDARD THERMOMETER : Theodor Friedrich : Dry No.839094 Wet No. 839094

: Thermoschneider No.9188 : Testo 645 Serial No. 6248057

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB220 No. V1220015

(Authorized Signatory)

for the Chief

Mechanical Engineer

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## The Result of Calibration

Certification No. 323/21

Page : 2 of 6

24 June, 2021

Standard	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure inches	Vacuum inches	Pressure hPa	Velocity m/sec	Correction m/sec
Ultrasonic Anemometer					
m/sec					
1.00	-	-	-	0.9	0.10
3.02	-	-	-	3.1	-0.08
5.00	-	-	-	4.9	0.10
7.00	-	-	-	7.2	-0.20
9.02	-	-	-	8.9	0.12
11.01	-	-	-	10.7	0.31
13.01	-	-	-	13.0	0.01
15.01	-	-	-	14.8	0.21
17.02	-	-	-	17.0	0.02
20.02	-	-	-	19.3	0.72

Wind Anemometer Board.	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270



Meteorological Instruments Bureau

Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

24 June, 2021

Certification No. 323.21

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
757.19	758.1	-0.91
756.23	757.2	-0.97
756.08	757.0	-0.92
755.76	756.7	-0.94
755.53	756.4	-0.87
755.43	756.3	-0.87
755.26	756.2	-0.94
755.09	756.0	-0.91
754.91	755.9	-0.99
754.73	755.6	-0.87
754.60	755.5	-0.90
756.83	757.8	-0.97
756.95	757.9	-0.95
757.08	758.0	-0.92
757.13	758.0	-0.87
757.25	758.2	-0.95
757.46	758.4	-0.94
757.37	758.3	-0.93
757.09	758.1	-1.01
756.96	757.8	-0.85
Average		

Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

24 June, 2021

Certification No. 323/21

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.0	0.2
31.2	31.1	0.1
16.4	16.5	-0.1

Mechanical Engineer





## THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



Date of Issue 24 June, 2021

Certification No. 323/21

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### The Result of Calibration

Certification No. 323/21

Page : 5 of 6

24 June, 2021

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
81.46	78	3.46
62.36	60	2.36
42.56	44	-1.44

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ยี่ห้อ Davis Instruments แบบ TIPPING  
BUCKET Product No. 6152 C Mfg. Code. BD190415079 ที่การสอบเทียบกับแก้ว  
ฝนแบบแก้วดวง GAUGE DIAMETER 8.0 INCHES , NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ทันทีไม่ต้องตามรายละเอียดของ  
เครื่องมือ ( 0.01 in/ TIP)



Mechanical Engineer

วิศวกรชำนาญการ

2448 10039

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 20 January, 2022 Certification No. 016/22

Page : 1 of 6

VERIFIED

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Vantage Pro 2 Model No. : 6152C

Mfg Code : Display BD190415090 Transmitter BD190415090

Customer : SGS (Thailand) Limited,

100 Nanglinchee Road, Chongnani,

Yamawa, Bangkok 10120,

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1012.6 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 S/N 91563

: HOOK GAGE NO 1425 : Wind Altit Plotting Board

N.I.S.T. Test Reference Number 731/241460

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-904H)

Serial Number 110730029 (sensor 1206295865)

JAPAN QUALITY ASSURANCE ORGANIZATION

STANDARD THERMOMETER : Theodor Friedrich : Dry No.839094 Wet No.838994

: Thermoschneider No.918B : Ietto, No.1206295865

STANDARD BAROMETER : Digital Barometer Vantage Type PTE270

(Authorized Signatory)

For the Chief

Sub-Standard Instrument

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



## The Result of Calibration

Certification No. 016/22

Page : 2 of 6

20 January, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure hPa (hPa)	Vacuum hPa (hPa)	Velocity m/sec	Velocity m/sec	Correction m/sec
1.00	-	-	-	0.9	0.10
3.02	-	-	-	3.1	-0.08
5.00	-	-	-	4.9	0.10
7.00	-	-	-	6.7	0.30
9.02	-	-	-	8.9	0.12
11.01	-	-	-	10.7	0.31
13.01	-	-	-	13.0	0.01
15.01	-	-	-	14.8	0.21
17.02	-	-	-	17.0	0.02
20.02	-	-	-	19.3	0.72

Wind Altit Plotting Board	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270



Meteorological Instruments Bureau

Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

Certification No. 016/22

20 January, 2022

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
760.50	761.4	-0.90
760.13	761.2	-1.07
760.67	761.6	-0.93
760.73	761.7	-0.97
757.28	758.3	-1.02
757.34	758.4	-1.06
757.52	758.5	-0.96
757.79	758.9	-1.11
758.10	759.1	-1.00
758.16	759.2	-1.04
758.68	759.7	-1.04
758.47	759.4	-0.93
758.56	759.5	-0.94
758.75	759.6	-0.85
758.96	760.0	-1.02
759.36	760.3	-0.94
756.54	757.6	-1.06
756.66	757.7	-1.04
757.00	759.0	-1.00
757.15	758.2	-1.05
Average		



Mechanical Engineer



Calibration & Test Section  
Meteorological Instruments Bureau



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

Certification No. 016/22

20 January, 2022

Page : 4 of 6

Standard Temp °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.4	-0.2
30.4	30.5	-0.1
15.1	15.1	0.0



Mechanical Engineer



Calibration & Test Section  
Meteorological Instruments Bureau



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel.081-454-2804,0-2399-0469



Date of Issue 20 January, 2022

Certification No. 016/22

The Result of Calibration

20 January, 2022

Certification No. 016/22

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ใบรับรอง

Page : 6 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
81.15	85	3.85
60.23	63	2.77
45.21	47	-1.79

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน อีทิด Davis Instruments แบบ TIPPING  
BUCKET Product No. 6152 C Mfg No. BD190415090 ที่การสอบเทียบกับแก้ว  
ฝนแบบแก้วลง GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าถูกต้องตามรายละเอียดของ  
เครื่องมือ ( 0.01 in/TIP)



วิศวกรชำนาญการ



Mechanical Engineer







# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

## The Result of Calibration

20 January, 2022

Certification No. 017.22

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
760.50	761.5	-1.00
760.13	761.2	-1.07
760.67	761.8	-1.13
760.73	761.9	-1.17
757.28	758.4	-1.12
757.34	758.5	-1.16
757.52	758.6	-1.09
757.79	758.9	-1.11
758.10	759.2	-1.10
758.46	759.3	-1.14
758.66	759.8	-1.14
759.47	759.6	-1.13
759.56	759.8	-1.24
758.75	759.9	-1.15
759.96	760.0	-1.02
759.36	760.5	-1.14
756.54	757.6	-1.06
756.66	757.8	-1.14
757.00	758.0	-1.00
757.15	758.2	-1.05
Average		-1.06

Average



Mechanical Engineer



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

20 January, 2022

Certification No. 017.22

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.1	0.1
30.4	30.4	0.0
15.1	15.2	-0.1



Mechanical Engineer





## THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



Date of Issue 20 January, 2022

Certification No. 017/22

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### The Result of Calibration

Certification No. 017/22

20 January, 2022

Page : 5 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
81.15	85	-3.85
60.73	67	-1.77
45.21	48	-2.79

หนังสือแนบขอรับรองว่า เครื่องวัดฝน ซีรี่ Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg No. BD190415091 ที่การสอบเทียบกันแล้ว  
แผ่นแบบแก้ว GAUGE DIAMETER 8.0 INCHES, NEGRETTE & ZAMBRA LONDON No 71082 และสามารถนำไปใช้ได้ทันทีไม่ต้องคำนวณและแก้ไขของ  
เครื่องมือ ( 0.01 in/TIP)



Mechanical Engineer



วิศวกรชำนาญการ

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THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 17 May, 2022 Certification No. 185/22

Page : 1 of 6

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Vantage Pro 2 Model No. : 6152C

Mfg Code : Display AK130626036 Transmitter A111101P020

Customer : SGS (Thailand) Limited.

100 Nanglinchae Road, Chongnonsi,  
Yamawa, Bangkok 10120.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1010.5 hPa

VERIFIED

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 SN 91563

: HOOK GAGE NO 1425 : Wind Aloft Plotting Board

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION

: Standard Velocity at 0 - 20 m/sec

STANDARD THERMOMETER : Theodor Friedrich : Dry No. 8390/94 Wet No. 8359/94

: Thermoschneider No. 9188 : Isoto. Testo 945 Sensor No. 074320

STANDARD BAROMETER : Digital Barometer-Vaisala Type PTB220 NO. V1220015



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

The Result of Calibration

Certification No. 185/22

17 May, 2022

Page : 2 of 6

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure inches H2O	Vacuum inches H2O	Velocity m/sec	Velocity m/sec	Correction m/sec
1.00	-	-	-	0.9	0.10
3.02	-	-	-	2.7	0.32
5.00	-	-	-	4.9	0.10
7.00	-	-	-	6.7	0.30
9.02	-	-	-	8.9	0.12
11.01	-	-	-	10.7	0.31
13.01	-	-	-	13.0	0.01
15.01	-	-	-	14.8	0.21
17.02	-	-	-	17.0	0.02
20.02	-	-	-	19.3	0.72

Wind Aloft Plotting Board.	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	



Mechanical Engineer





The Result of Calibration

Certification No. 185/22

17 May, 2022

Page : 3 of 6

Standard Barometer	Tested Barometer	Correction
Pressure	Pressure	
756.11	758.4	-0.29
756.26	756.6	-0.34
756.92	756.2	-0.28
753.01	753.3	-0.29
752.57	752.8	-0.23
752.92	753.2	-0.28
753.26	753.5	-0.24
753.92	754.2	-0.28
754.33	754.6	-0.27
754.98	755.3	-0.32
755.51	755.9	-0.39
753.83	754.1	-0.27
754.26	754.6	-0.35
755.29	755.6	-0.31
756.27	756.5	-0.23
756.59	756.8	-0.31
756.87	757.1	-0.23
756.23	756.5	-0.27
755.63	755.9	-0.27
754.89	755.1	-0.21
Average		-0.21

Average



Mechanical Engineer

The Result of Calibration

Certification No. 185/22

17 May, 2022

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.4	-0.2
30.4	30.5	-0.1
15.2	15.3	-0.1



Mechanical Engineer





THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



The Result of Calibration

Date of Issue 17 May, 2022

Certification No. 185/22

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17 May, 2022

Certification No. 185/22

Page : 5 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
82.40	79	-3.40
61.62	59	-2.62
45.32	44	-1.32

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ชีพ้อ Davis Instruments แบบ TIPPING  
BUCKET Product No. 6152 CUK Mfg. Code. A111101P020 ทำการสอบเทียบกับ  
แก้วฝนแบบแก้ววง GAUGE DIAMETER 8.0 INCHES , NEGRETTI & ZAMBRA  
LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าถูกต้องตามรายละเอียดของ  
เครื่องมือ ( 0.2 mm/ TIP)

ใบรับรอง



วิศวกรชำนาญการ



Mechanical Engineer

# THAI METEOROLOGICAL DEPARTMENT



4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 17 May, 2022 Certification No. 187/22

Page : 1 of 6

Object : Precision Weather Station  
 Manufacturer : Davis Instruments  
 Type : Vantage Pro 2 Model No. : 6152C  
 Mfg Code : Display AZ170619045 Transmitter AZ170619045  
 Customer : SGS (Thailand) Limited.  
 100 Nanglinchee Road, Chongnonsi,  
 Yanmawa, Bangkok 10120.  
 Calibration Condition : Temperature 25.1 °C Barometric Pressure 1006.5 hPa

VERIFIED

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 SIN 91563

: HOOK GAGE NO 1425 : Wind Aloft Plotting Board

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629506)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 0 - 20 m/sec

STANDARD THERMOMETER : Theodor Friedrich : Dry No.8390/94 Wet No. 8389/94

: Thermoschneider No.9188 : Testo, testo 645 994, No. 0764697

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB220 No. 112200415



Mechanical Engineer



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

Certification No. 187/22

Page : 2 of 6

17 May, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425		TESTED ANEMOMETER	
	Pressure inches H2O	Vacuum inches H2O	Velocity m/sec	Correction m/sec
1.00	-	-	0.9	0.10
3.02	-	-	2.7	0.32
5.00	-	-	4.9	0.10
7.00	-	-	6.7	0.30
9.02	-	-	8.9	0.12
11.01	-	-	10.7	0.31
13.01	-	-	13.0	0.01
15.01	-	-	14.7	0.31
17.02	-	-	17.0	0.02
20.02	-	-	19.3	0.72

Wind Aloft Plotting Board.	
US DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270



Mechanical Engineer





# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

## The Result of Calibration

Certification No. 187/22

17 May, 2022

Page : 3 of 6

Standard Barometer	Tested Barometer	Correction
Pressure	Pressure	
756.11	756.1	0.01
756.26	756.3	-0.04
755.92	756.1	-0.18
753.01	753.1	-0.09
752.57	752.7	-0.13
752.92	753.0	-0.08
753.26	753.4	-0.14
753.92	754.1	-0.18
754.33	754.4	-0.07
754.98	755.0	-0.02
755.51	755.6	-0.09
753.83	754.0	-0.17
754.25	754.4	-0.15
755.29	755.3	-0.01
756.27	756.4	-0.13
756.59	756.7	-0.11
756.87	757.0	-0.13
756.23	756.4	-0.17
755.63	755.7	-0.07
754.89	755.0	-0.11
Average		

Mechanical Engineer



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

Certification No. 187/22

17 May, 2022

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.2	45.3	-0.1
30.4	30.4	0.0
15.2	15.3	-0.1



Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



Date of Issue 17 May, 2022

Certification No. 187/22

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The Result of Calibration

17 May, 2022

Certification No. 187/22

Page : 5 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
82.40	84	-1.60
61.62	62	-0.38
45.32	46	-0.68

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดส่น ชีห้อ Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg. Code. AZ170619045 ที่การสอบเทียบกับแก้ว ส่นแบบแก้วดวง GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA LONDON No 71082 และสามารถนำมาป้ใช้ได้ มีค่าจุดต้องตามรายละเอียดของ เครื่องมือ ( 0.01 in/ TIP)



Mechanical Engineer

วิศวกรชำนาญการ







## The Result of Calibration

15 June, 2022

Certification No. 219/22

Page : 3 of 6

Standard Barometer Pressure	Tested Barometer Pressure	Correction
754.87	755.5	-0.63
754.75	755.4	-0.65
754.27	754.9	-0.63
754.55	755.2	-0.65
754.74	755.5	-0.76
755.22	756.9	-0.68
755.49	756.1	-0.61
755.78	758.4	-0.62
755.99	756.5	-0.51
756.51	757.1	-0.59
756.05	756.8	-0.55
756.33	756.8	-0.47
756.47	757.0	-0.53
753.77	754.5	-0.73
754.03	754.7	-0.67
755.03	755.7	-0.67
755.25	755.9	-0.65
756.69	757.2	-0.61
755.74	756.3	-0.56
755.99	756.5	-0.51
Average		

Mechanical Engineer



## The Result of Calibration

15 June, 2022

Certification No. 219/22

Page : 4 of 6

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.5	45.4	0.1
30.2	30.1	0.1
15.4	15.4	0.0

Mechanical Engineer



THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



The Result of Calibration

Date of Issue 15 June, 2022

Certification No. 219/22

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ใบรับรอง

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
83.02	81	2.02
62.18	61	1.18
43.27	42	1.27

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ซีท็อ Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg. Code. BD190415077 ที่การสอบเทียบกับแก้วฝนแบบแก้ววง GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าคลาดเคลื่อนรายละเอียดของเครื่องมือ (0.01 มม/ TIP)



Mechanical Engineer



วิศวกรชำนาญการ

CHAB 19137

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 15 June, 2022 Certification No. 218/22

Page : 1 of 6

Object : Precision Weather Station

Manufacturer : Davis Instruments

Type : Vantage Pro 2 Model No. : 6152C

Mfg Code : Display BD190415078 Transmitter BD190415078

Customer : SGS (Thailand) Limited.  
100 Nanglinchee Road, Chongnonsi,  
Yannawa, Bangkok 10120.

VERIFIED

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1007.1 hPa

NATIONAL STANDARD WIND TUNNEL : Thermal Anemometer 642 S/N 91563

: HOOK GAGE NO 1425 : Wind Aloft Plotting Board

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90A-H)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 0 - 20 m/sec

STANDARD THERMOMETER : Theodor Friedrich : Dry No.8390/94 Wet No. 8389/94

: Thermoschneider No.9188 : testo 845 Serial No.83296057

STANDARD BAROMETER : Digital Barometer Vaisala Type PTB220 No. V1220015

Mechanical Engineer

(Authorized Signatory)  
for the Chief  
Sub-Standard Instrument



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## The Result of Calibration

Certification No. 218/22

Page : 2 of 6

15 June, 2022

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure hPa/100	Vacuum hPa/100	Velocity m/sec	Velocity m/sec	Correction m/sec
1.00	-	-	-	0.9	0.10
3.02	-	-	-	2.7	0.32
5.00	-	-	-	4.9	0.10
7.00	-	-	-	6.7	0.30
9.02	-	-	-	8.9	0.12
11.01	-	-	-	10.3	0.71
13.01	-	-	-	12.5	0.51
15.01	-	-	-	14.3	0.71
17.02	-	-	-	16.5	0.52
20.02	-	-	-	19.3	0.72

Wind Aloft Plotting Board.	
US.DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Mechanical Engineer







THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 0-2396-0156, 0-2399-0469

The Result of Calibration

15 June, 2022

Certification No. 218/22

Page : 3 of 6

Standard Barometer	Tested Barometer	Correction
Pressure	Pressure	
754.87	755.9	-1.03
754.75	755.8	-1.05
754.27	755.3	-1.03
754.55	755.7	-1.15
754.74	755.9	-1.16
755.22	756.2	-0.98
755.49	756.4	-0.91
755.78	756.8	-1.02
755.99	757.0	-1.01
756.51	757.7	-1.19
756.05	757.1	-1.05
756.33	757.4	-1.07
756.47	757.6	-1.13
753.77	754.9	-1.13
754.03	755.1	-1.07
755.03	756.1	-1.07
755.25	756.4	-1.15
756.59	757.5	-0.91
755.74	756.8	-1.06
755.99	757.1	-1.11
Average		-1.05

Mechanical Engineer



Calibration & Test Section  
Meteorological Instruments Bureau



THAI METEOROLOGICAL DEPARTMENT

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The Result of Calibration

Certification No. 218/22

Page : 4 of 6

15 June, 2022

Standard Temp. °C	Temperature Sensor Reading	
	Reading °C	Correction °C
45.5	45.6	-0.1
30.2	30.2	0.0
15.4	15.3	0.1



Mechanical Engineer



Calibration & Test Section  
Meteorological Instruments Bureau

# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469



Date of Issue 15 June, 2022

Certification No. 218/22

Page : 6 of 6

## The Result of Calibration

15 June, 2022

Certification No. 218/22

Page : 5 of 6

Standard Humidity % R.H.	Relative Humidity Sensor Reading	
	Reading % R.H.	Correction % R.H.
83.02	85	-1.98
62.18	63	-0.82
43.27	42	1.27

หนังสือฉบับนี้ขอรับรองว่า เครื่องวัดฝน ซีพีอี Davis Instruments แบบ TIPPING BUCKET Product No. 6152 C Mfg. Code. BD190415078 ทำการสอบเทียบกันแก้ว  
ฝนแบบแก้ว GAUGE DIAMETER 8.0 INCHES, NEGRETTI & ZAMBRA LONDON No 71082 และสามารถนำไปใช้ได้ มีค่าจุดตั้งตามรายละเอียดของ  
เครื่องมือ (0.01 in / TIP)



Mechanical Engineer



วิศวกรชำนาญการ

Request No. 21-64/0638 MTC No. EEL BP. 67/0664

## CALIBRATION CERTIFICATE

Submitted by : SGS (Thailand) Ltd.  
Address : 100 Nanglinchee Rd., Chongnonsee, Yamaa, Bangkok 10120.  
Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.  
Sri IC, Bangpoo Industrial Estate, Sukhumvit Rd., A.Muang, Samutprakan 10280.

**Instrument Calibrated :**  
Description : Sound Level Meter  
Manufacturer : Rion  
Model : NL-21  
Serial No. : 00922234 (ENSL008)  
Microphone : Type UC-52 No.99263  
Preamplifier : Type NH-21 No.13495

**Ambient Environment**  
Temperature :  $(23 \pm 3) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 15) \%$   
Ambient Pressure :  $(101.325 \pm 1.5) \text{ kPa}$

### Standards used :

1. Band Pass Filter Wavetek 752A S/N 90010494.
2. Condenser Microphone Brüel&Kjær 4180 S/N 2633526.
3. Decade Attenuator Ando AI-205 S/N 00464602.
4. Function/Arbitrary Waveform Generator Agilent 33220A S/N MY44042668.
5. Digital Function Synthesizer NF Electronic Instruments DF-193A S/N 122037.
6. Digital Multimeter Fluke 8520A S/N 4985007.
7. Pistonphone Rion NC-72 S/N 00402446.
8. Measuring Amplifier Brüel&Kjær 2636 S/N 1537484.

VERIFIED

Date of Receipt : 14 Jun. 2021

Date of Calibration : 1-2 Jul. 2021

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Request No. 21-64/0638 MTC No. EEL BP. 67/0664

9. Power Amplifier Brüel&Kjær 2706 S/N 1517650.
10. Speaker Tannoy Limited, Great Britain British Patent No. 215300.
11. Digital Multimeter Agilent 34401A S/N MY44005560.
12. Programmable Attenuator Tannagawa TPA-303A S/N 2212.

### Calibration Procedure :

This instrument was calibrated by using calibration procedures no CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electroacoustics - Sound Level Meters - Part 3 : Periodic tests (2006). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out with the direct measurement method. The acoustic signal test was performed in an anechoic room with the comparison measurement method.

This instrument has been calibrated against standards maintained at the Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

VERIFIED

Date of Calibration : 1-2 Jul. 2021

2 / 8

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NSC-TISTR 17025  
CALIBRATION 0037

77-TISTR

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

### 1. Absolute Sensitivity

Reference Acoustic Signal (dB)	Unit Under Test				Tolerance Limit Class 2 (-dB)
	Measured Value (dB)		Deviation (dB)	Uncertainty (+/-dB)	
	Before adjust	After adjust			
113.94	114.1	113.9	0.0	0.30	1.4

Note: The external calibration adjustment was firstly performed. The internal calibration adjustment was then completed at the display of 117.6 dB.

### 2. Self-generated noise

#### 2.1 Normal test

Measured value (dB)	Uncertainty (±dB)
22.1	0.10

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

Frequency Weighting	Measured Value (dB)	Uncertainty (±dB)
A-Weighting	14.5	0.10
C-Weighting	20.7	0.10
Flat	26.9	0.10

VERIFIED

Date of Calibration : 1-2 Jul. 2021

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NSC-TISTR 17025  
CALIBRATION 0037

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

### 3. Acoustical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
125	-0.1	0.1	0.0	0.40	2.0
1 000	0.1	0.0	0.1	0.40	1.4
4 000	-0.2	-0.1	-0.2	0.40	3.6

### 4. Electrical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
63	0.0	-0.1	-0.1	0.20	2.5
125	0.0	0.0	0.0	0.20	2.0
250	0.0	0.0	0.0	0.20	1.9
500	0.0	0.0	0.0	0.20	1.9
1 000	0.0	0.0	0.0	0.20	1.4
2 000	0.1	0.2	0.2	0.20	2.6
4 000	0.1	0.2	0.2	0.20	3.6
8 000	0.3	0.3	0.1	0.20	5.6

VERIFIED

Date of Calibration : 1-2 Jul. 2021

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Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

## 5. Frequency and time weightings at 1 kHz

### 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty (-dB)	Tolerance Limits Class 2 (±dB)
A-weighting	94.0	0.0	0.20	0.4
C-weighting	94.0	0.0	0.20	0.4
Flat	94.0	0.0	0.20	0.4

### 5.2 Time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty (-dB)	Tolerance Limits Class 2 (±dB)
Fast	94.0	0.0	0.20	0.3
Slow	94.0	0.0	0.20	0.3
Leq	94.0	0.0	0.20	0.3

## 6. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (-dB)	Tolerance Limits Class 2 (±dB)
125	125.0	0.0	0.30	1.4
124	124.0	0.0	0.30	1.4
123	123.0	0.0	0.30	1.4
122	122.0	0.0	0.30	1.4
121	121.0	0.0	0.30	1.4
120	120.0	0.0	0.30	1.4
119	119.0	0.0	0.30	1.4
114	114.0	0.0	0.30	1.4
109	109.0	0.0	0.30	1.4

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Date of Calibration : 1-2 Jul. 2021

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NSC-TISTR 17025  
CALIBRATION 0037

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

## 6. Level linearity on the reference level range (continue)

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (-dB)	Tolerance Limits Class 2 (±dB)
104	104.0	0.0	0.30	1.4
99	99.0	0.0	0.30	1.4
94	94.0	0.0	0.30	1.4
89	89.0	0.0	0.30	1.4
84	84.1	0.1	0.30	1.4
79	79.0	0.0	0.30	1.4
74	74.1	0.1	0.30	1.4
69	69.1	0.1	0.30	1.4
64	64.0	0.0	0.30	1.4
59	59.0	0.0	0.30	1.4
54	54.0	0.0	0.30	1.4
49	49.0	0.0	0.30	1.4
44	44.0	0.0	0.30	1.4
39	38.9	-0.1	0.30	1.4
34	34.0	0.0	0.30	1.4
33	33.1	0.1	0.30	1.4
32	31.9	-0.1	0.30	1.4
31	31.0	0.0	0.30	1.4
30	29.9	-0.1	0.30	1.4
29	28.9	-0.1	0.30	1.4
28	27.9	-0.1	0.30	1.4

VERIFIED

Date of Calibration : 1-2 Jul. 2021

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CALIBRATION 0017

77-TISTR

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

7. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (+dB)	Tolerance Limits Class 2 (±dB)
40-130	125	125.0	0.0	0.30	1.4
30-120	115	115.0	0.0	0.30	1.4
20-110	105	105.0	0.0	0.30	1.4
20-100	95	95.0	0.0	0.30	1.4
20-90	85	85.1	0.1	0.30	1.4
20-80	75	75.1	0.1	0.30	1.4

8. Tone burst response

Time Weighting	Toneburst Duration, Tb (ms)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (dB)
Fast	200	116.0	0.0	0.20	±1.3
	2	98.9	-0.1	0.20	+1.3; -2.8
	0.25	89.9	-0.1	0.20	+1.8; -5.3
Slow	200	109.6	0.0	0.20	±1.3
	2	90.0	0.0	0.20	+1.3; -5.3
	200	110.0	0.0	0.20	±1.3
SEL	2	90.0	0.0	0.20	+1.3; -2.8
	0.25	80.8	-0.2	0.20	+1.8; -5.3

VERIFIED

Date of Calibration : 1-2 Jul, 2021

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NSC-TISTR 17025  
CALIBRATION 0017

77-TISTR

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0638

MTC No. EEL. BP. 67/0664

9. Peak C sound level

Number of cycles in test signal	Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (±dB)	Tolerance limits Class 2 (±dB)
Complete cycle	125.4	125.0	-0.4	0.20	2.4
Positive half cycle	124.4	124.2	-0.2	0.20	1.4
Negative half cycle	124.4	124.2	-0.2	0.20	1.4

10. Overload indication

Measured value (dB)		Deviated value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
Positive one-half cycle	Negative one-half cycle	0.0	0.30	1.8
135.7	135.7			

VERIFIED

Approved by :



Acting Director

Electrical and Electronic Standards Laboratory  
Industrial Metrology and Testing Service Centre

Ref : 2011264061402561001

End of Certificate

8 / 8

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Eng. On

INNOVATIVE INSTRUMENT CALIBRATION LAB  
INNOVATIVE INSTRUMENT CO. LTD. HEAD OFFICE  
719 MOO 13, SOI 38 NINAKORN 11 TAMBON BANG KAE O,  
AMPHOE BANG PHU SAKH T PRAKAN PROVINCE 10140 THAILAND  
TEL : 06-09-2116-7860-1 FAX : 06-09-2116-7140



Page: 1/6

## Certificate of Calibration

**Customer**  
Name : SCS (Thailand) Limited  
Address : 100 Nangliachue Road, Chongprert, Yamaea Bangkok 10120  
Certificate No : 22-ACT-166  
Request No : Req-2022-0418

### Unit Under Calibration Details

Measurement item : Sound Level Meter  
Manufacturer : RION  
Model : NL-23  
Serial Number : 09241242  
ID :  
Resolution : 0.1 dB  
Microphone Class : 2  
Microphone Model : UC-52  
Microphone SN : 145206  
Pre-amplifier Model : NH-23  
Pre-amplifier SN : 21291  
Instrument Status : Used

### Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 23 February 2022  
Calibrated Date : 7 March 2022

Calibration Procedure : In-house method CP-SL-M-01 based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests

Location of Calibration : Lab Acoustic

### Reference Standard

Instrument	Brand	Model	SN	Date calibration	Traceability
Standard Microphone	GRAS	40AN	183273	15 September 2022	GRAS
Mid-frequency Calibrator	Quest	Quest-cal	EFAD00214	14 June 2022	TSI
Audio Generator	Swanick	Swan401	131	18 October 2022	Wk. Electric

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %

Calibration Office

Calibration Engineer Supervisor

Issue Date : 7 March 2022

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The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FIN-706-SL-M-01 Rev.0 Issue date 01/07/19

INNOVATIVE INSTRUMENT CALIBRATION LAB  
INNOVATIVE INSTRUMENT CO. LTD. HEAD OFFICE  
719 MOO 13, SOI 38 NINAKORN 11 TAMBON BANG KAE O,  
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TEL : 06-09-2116-7860-1 FAX : 06-09-2116-7140



Page: 2/6

Certificate No : 22-ACT-166  
Request No : Req-2022-0418

### 1. Indication at the calibration check frequency

UUC Setting	Nonfatal	Before Adjust	Adjust	UNCERTAINTY	Acceptance Limit
FAST : A / 30/120	Level	UUC	ERR	ERR	(± dB)
Calibrator Setting	(dB)	(dB)	(dB)	(dB)	(± dB)
1000 Hz 94.00 dB	94.08	94.2	-0.12	94.1	-0.02

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand Cirrus, Model CR-515, SN: 80411

### 2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST : 20-80		
UUC Weighting	(dB)	(± dB)
A	23.1	0.10

### 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY
FAST : 20-80		
UUC Weighting	(dB)	(± dB)
A	12.4	0.10
C	15.9	0.10
Z	21.2	0.10

### 4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve	UNCERTAINTY	Acceptance Limit
FAST : 30/120	A	C	Z
STD Setting	(dB)	(dB)	(dB)
125 Hz	0.4	0.6	0.6
1000 Hz	0.0	0.0	0.0
4000 Hz	-1.6	-1.7	-1.7
8000 Hz	-2.8	-2.9	-2.9

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FIN-706-SL-M-01 Rev.0 Issue date 01/07/19

Certificate No : 22-ACT-166  
Request No : Req-2022-0418

5. Electrical signal test of frequency weightings. Weighting network response with relative to 1 kHz.

UUC Setting	Deviation from various Frequency				UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	Weighting Response curve					
FAST 30-120	A (dB)	C (dB)	Z (dB)			
STD Setting						
63 Hz	-0.2	-0.1	-0.1			2.0
125 Hz	-0.2	0.0	0.0			1.5
250 Hz	-0.2	0.0	0.0			1.5
500 Hz	-0.1	0.0	0.0			1.5
1000 Hz	0.0	0.0	0.0		0.2	1.0
2000 Hz	0.1	0.1	0.1			2.0
4000 Hz	0.1	0.1	0.1			3.0
8000 Hz	0.2	0.2	0.1			5
16000 Hz	-1.7	-1.7	-2.4			+5, -40dB

6. Frequency and time weightings at 1kHz

UUC Setting	Measured				Acceptance Limit (± dB)
	STD	REF	UUC	ERR	
FAST / 30-120					
UUC Weighting					
A	114.00	114.00	114.0	0.0	± 0.2
C	114.00	114.00	114.1	0.1	± 0.2
Z	114.00	114.00	114.1	0.1	± 0.2

UUC Setting	Measured				Acceptance Limit (± dB)
	STD	REF	UUC	ERR	
30-120 / A					
UUC Time Response					
Fast	114.00	114.00	114.0	0.0	± 0.1
Slow	114.00	114.00	114.0	0.0	± 0.1
Long	114.00	114.00	114.0	0.0	± 0.1

Certificate No : 22-ACT-166  
Request No : Req-2022-0418

7. Long Term Stability

UUC Setting	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST / A / 30-120	UUC (dB)		
STD Setting				
Initial		114.0		
Final		114.0		
Deviation		0.0	0.1	0.3

8. Level linearity on the reference level range

UUC Setting	Anticipated		Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST / A / 30-120	REF (dB)	UUC (dB)	ERR (dB)		
STD dB						
120.00		120	120.0	0.0		1.1
110.00		110	110.0	0.0		1.1
114.00		114	114.0	0.0		1.1
100.00		100	100.0	0.0		1.1
104.00		104	104.0	0.0		1.1
90.00		90	90.0	0.0		1.1
94.00		94	94.0	0.0		1.1
80.00		80	80.1	0.1		1.1
84.00		84	84.1	0.1		1.1
70.00		70	70.0	0.0		1.1
74.00		74	74.0	0.0		1.1
60.00		60	60.0	0.0		1.1
64.00		64	64.0	0.0		1.1
50.00		50	50.0	0.0		1.1
54.00		54	54.0	0.0		1.1
40.00		40	40.0	0.0		1.1
44.00		44	44.0	0.0		1.1
30.00		30	30.0	0.0		1.1
34.00		34	33.9	-0.1		1.1
20.00		20	20.0	-0.1		1.1

Certificate No : 22-ACT-166  
Request No : Req-2022-0418

9. Level linearity including the level range control

UUC Setting	Anticipated		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	STD	REF	UUC (dB)	ERR (dB)		
FAST / A						
UUC Range						
30-120			32.50	0.2	0.3	1.1
			114	0.0		1.1

10. Tone burst response

UUC Setting	Anticipated		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	STD	Ref	UUC (dB)	ERR (dB)		
A : 30-120						
UUC Time Response						
Fast						
	200	116.0	116.0	0.0		1
	2	99.0	99.9	-0.1		+1.0, -2.5
	0.25	90.0	89.9	-0.1		+1.5, -5.0
Slow						
	200	109.6	109.6	0.0	0.3	1
	2	90.0	90.0	0.0		+1.0, -5.0
	200	110.0	110.0	0.0		1
SEL						
	2	90.0	90.0	0.0		+1.0, -2.5
	0.25	81.0	80.8	-0.2		+1.5, -5.0

11. Peak C Sound level

UUC Setting	Anticipated		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	REF	UUC (dB)	ERR (dB)			
FAST / C : 55-141						
STD Setting						
Complete cycle	136.4	135.9	-0.50		3.0	
Positive half cycle	135.4	135.1	-0.30	0.2	2.0	
Negative half cycle	135.4	135.1	-0.30		2.0	

The results related only to the items calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
P/N: 508-54.34.01 Rev.0 Issue date 01/07/19

Certificate No : 22-ACT-166  
Request No : Req-2022-0418

12. Overload indication

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A : 40-130			
STD Setting			
Positive one-half cycle	139.2		
Negative one-half cycle	139.0		
Deviated	0.2	0.2	1.5

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A : 40-130			
STD Setting			
Initial	129.0		
Final	129.0		
Deviated	0.0	0.1	0.3

End of Certificate

The results related only to the items calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
P/N: 508-54.34.01 Rev.0 Issue date 01/07/19



## Certificate of Calibration

**Customer**  
Name : SGS (Thailand) Limited  
Address : 100 Nanglaechar Road, Chongnaburi, Yamnawa Bangkok, 10120

Certificate No : 22-ACT-167  
Request No : Req-2022-0419

### Unit Under Calibration Details

Measurement Item : Sound Level Meter  
Manufacturer : RIKON  
Model : NL-21  
Serial Number : 00308340  
ID : 1  
Resolution : 0.1 dB  
Calibration Status : Used

Microphone Class : 2  
Microphone Model : UC-52  
Microphone SN : 124738  
Preamplifier Model : NH-21  
Preamplifier SN : 30073

### Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 23 February 2022  
Calibrated Date : 7 March 2022  
Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic

### Reference Standard

Instrument	Brand	Model	SN	Date calibration	Traceability
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Multi-frequency Calibrator	Quest	Quest-cal	EF A000254	14 June 2022	TISI
Audio Generator	Stank	Stank401	133	18 October 2022	WK Electric

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibration Officer

Calibration Engineer Supervisor

Issue Date :

7 March 2022

VERIFIED

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FM-789-04-M-01 Rev.0 Issue date 01/07/19

Certificate No : 22-ACT-167  
Request No : Req-2022-0419

### 1. Indication at the calibration check frequency

UUC Setting	Nominal Level	Before Adjust		Adjust		Acceptance Limit
		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)	
FAST : A, 30-120						
Calibrator Setting : 94.00		94.1	-0.02	94.1	-0.02	0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand Cirrus, Model CB-515, SN: 00411

### 2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST : 20-80		
UUC Weighting : A	24.9	(± dB)
		0.10

### 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY
FAST : 20-80		
UUC Weighting : A	18.9	(± dB)
		0.10
C	22.7	0.10
Z	28.7	0.10

### 4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Derivation from various Frequency Weighting Response curve				Acceptance Limit
	A	C	Z	UNCERTAINTY	
FAST : 30-120				(± dB)	(± dB)
STD setting					
125 Hz	-0.1	0.1	0.1	0.30	1.5
1000 Hz	0.0	0.0	0.0	0.60	1.0
4000 Hz	0.5	0.5	0.6	0.60	3.0
8000 Hz	-1.2	-1.1	-1.2	0.70	5.0

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FM-789-04-M-01 Rev.0 Issue date 01/07/19

Certificate No: 22-ACI-167  
 Request No: Req-2022-0419

Certificate No: 22-ACI-167  
 Request No: Req-2022-0419

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency			UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	Weighting Response curve				
FAST /30-120	A (dB)	C (dB)	Z (dB)	0.2	2.0
STD Setting					1.5
63 Hz	-0.2	-0.1	-0.1		1.5
125 Hz	-0.1	0.0	-0.1		
250 Hz	-0.1	-0.1	0.0		
500 Hz	-0.1	0.0	0.0		
1000 Hz	0.0	0.0	0.0		
2000 Hz	0.1	0.1	0.1		
4000 Hz	0.0	0.1	0.1		
8000 Hz	0.1	0.1	0.1		
16000 Hz	-1.8	-1.8	-2.4		±5, INF.

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC	ERR		
		(dB)	(dB)		
FAST / 30-120					
UUC Weighting					
A	114.00	114.0	0.0	0.2	0.2
C	114.00	114.0	0.0	0.2	0.2
Z	114.00	114.0	0.0	0.2	0.2

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC	ERR		
		(dB)	(dB)		
30-120 / A					
UUC Time Response					
Fast	114.00	114.0	0.0	0.1	0.1
Slow	114.00	114.0	0.0	0.1	0.1
1 eq	114.00	114.0	0.0	0.1	0.1

7. Long Term Stability

UUC Setting	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	UUC			
	(dB)			
FAST / A / 30-120				
STD Setting				
Initial		114.0		
Final		114.0		
Deviation		0.0	0.1	0.3

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC	ERR		
		(dB)	(dB)		
FAST / A / 30-120					
STD dB					
120.00	120	120.0	0.0		1.1
110.00	110	110.0	0.0		1.1
114.00	114	114.0	0.0		1.1
100.00	100	100.0	0.0		1.1
104.00	104	104.0	0.0		1.1
90.00	90	90.0	0.0		1.1
94.00	94	94.0	0.0		1.1
80.00	80	80.0	0.0		1.1
84.00	84	84.1	0.1		1.1
70.00	70	70.0	0.0		1.1
74.00	74	74.0	0.0		1.1
60.00	60	60.0	0.0		1.1
64.00	64	64.0	0.0		1.1
50.00	50	50.0	0.0		1.1
54.00	54	54.0	0.0		1.1
40.00	40	40.0	0.0		1.1
44.00	44	44.0	0.0		1.1
30.00	30	30.0	0.0		1.1
34.00	34	34.0	0.0		1.1
20.00	20	20.0	-0.1		1.1

Certificate No : 22-ACT-167  
Request No : Req-2022-0419

### 9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST / A	REF (dB)				
UUC Range		32.20	32.6	0.3	1.1
30~120		114	114.0	0.0	1.1

### 10. Tone burst response

UUC Setting	STD Toneburst (ms)	Anticipated Ref (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
			UUC (dB)	ERR (dB)		
A : 10~120						
UUC Time Response						
Fast	200	116.0	116.0	0.0	0.3	1
	2	99.0	99.0	0.0		+1.0, -2.5
	0.25	90.0	89.9	-0.1		+1.5, -5.0
Slow	200	109.6	109.6	0.0	0.3	1
	2	90.0	90.0	0.0		+1.0, -5.0
SLL	200	110.0	110.0	0.0		1
	2	90.0	90.0	0.0		+1.0, -2.5
	0.25	81.0	80.9	-0.1		+1.5, -5.0

### 11. Peak C Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST / C : 55~141					
STD Setting					
Complete cycle	136.4	135.9	-0.50	0.2	3.0
Positive half cycle	135.4	135.1	-0.30		2.0
Negative half cycle	135.4	135.1	-0.30		2.0

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
P04-706-5814-01 Rev. 0 Issue Date 01/07/19

Certificate No : 22-ACT-167  
Request No : Req-2022-0419

### 12. Overload indication

UUC Setting	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A : 40~130			
STD Setting			
Positive one-half cycle	139.2		
Negative one-half cycle	139.0		
Deviated	0.2	0.2	1.5

### 13. High Level Stability

UUC Setting	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A : 40~130			
STD Setting			
Initial	129.0		
Final	129.0		
Deviated	0.0	0.1	0.3

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
P04-706-5814-01 Rev. 0 Issue Date 01/07/19



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0851

MTC No. EEL. BP. 58/0964

## CALIBRATION CERTIFICATE

Submitted by : SGS (Thailand) Ltd.

Address : 100 Nanglinchee Rd., Chongnonsae, Yamawa, Bangkok 10120.

Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.

Sol IC, Bangpoo Industrial Estate, Sukhumvit Rd., A Muang, Samutprakan 10280.

### Instrument Calibrated :

Description : Sound Level Meter

Manufacturer : Rion

Model : NL-21

Serial No. : 00398392

Microphone : Type UC-52 No.167319

Preamplifier : Type NH-21 No.32087

### Standards used :

1. Band Pass Filter Stanford Research Systems SR 650 S/N 28712.
2. Condenser Microphone Brüel&Kjær 4180 S/N 2889871.
3. Decade Attenuator Ando AL-205 S/N 00464602.
4. Function/Arbitrary Waveform Generator Agilent 33220A S/N MY4402668.
5. Digital Function Synthesizer NF Electronic Instruments DF-193A S/N 122037.
6. Digital Multimeter Fluke 8520A S/N 4985007.
7. Pistonphone Rion NC-72 S/N 00402446.
8. Measuring Amplifier Brüel&Kjær 2636 S/N 1537484.

VERIFIED

Date of Receipt : 17 Sep. 2021

Date of Calibration : 14-15 Oct. 2021

The results relate only to the items tested/calibrated or value assigned. Adapting the Report's purpose and validity of the results except as full are prohibited unless written permission is obtained from the Governor of TISTR.

### Head Office

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FM.BL.MTC.002 Rev.4

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0851

MTC No. EEL. BP. 58/0964

9. Power Amplifier Brüel&Kjær 2706 S/N 1517650.
10. Speaker Tannoy Limited, Great Britain British Patent No. 215300.
11. Digital Multimeter Agilent 34401A S/N MY44005560.
12. Programmable Attenuator Tamagawa TPA-303A S/N 2212.

### Calibration Procedure :

This instrument was calibrated by using calibration procedures no CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electroacoustics - Sound Level Meters - Part 3 : Periodic tests (2006). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out with the direct measurement method. The acoustic signal test was performed in an anechoic room with the comparison measurement method.

This instrument has been calibrated against standards maintained at the Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

VERIFIED

Date of Calibration : 14-15 Oct. 2021

The results relate only to the items tested/calibrated or value assigned. Adapting the Report's purpose and validity of the results except as full are prohibited unless written permission is obtained from the Governor of TISTR.

### Head Office

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FM.BL.MTC.002 Rev.4



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-640851

MTC No. EEL. BP. 58/0964

### 1. Absolute Sensitivity

Reference Acoustic Signal (dB)	Unit Under Test				Tolerance Limit Class 2 (±dB)
	Measured Value (dB)		Deviation (dB)	Uncertainty (±dB)	
	Before adjust	After adjust			
113.94	113.3	113.9	0.0	0.30	1.4

Note: The external calibration adjustment was firstly performed. The internal calibration adjustment was then completed at the display of 114.3 dB.

### 2. Self-generated noise

#### 2.1 Normal test

Measured value (dB)	Uncertainty (±dB)
16.8	0.10

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

Frequency	Measured Value (dB)	Uncertainty (±dB)
Weighting		
A-Weighting	14.3	0.10
C-Weighting	19.9	0.10
Flat	26.2	0.10

VERIFIED

Date of Calibration : 14-15 Oct. 2021

The results relate only to the items tested/calibrated or value assigned. Adherence to the Report's Certificate and validity of the results except in full are prohibited unless written permission is obtained from the Governor of TISTR.

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FM.BL.MTC.002 Rev.4



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-640851

MTC No. EEL. BP. 58/0964

### 3. Acoustical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
125	0.2	0.3	-0.1	0.40	2.0
1 000	0.1	0.1	0.2	0.40	1.4
4 000	-1.0	-1.0	-1.0	0.40	3.6

### 4. Electrical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
63	0.0	-0.1	-0.2	0.20	2.5
125	0.0	0.0	-0.1	0.20	2.0
250	0.0	-0.1	-0.1	0.20	1.9
500	-0.1	0.0	0.0	0.20	1.9
1 000	0.0	0.0	0.0	0.20	1.4
2 000	0.0	0.1	0.2	0.20	2.6
4 000	0.0	0.1	0.2	0.20	3.6
8 000	0.2	0.3	0.1	0.20	5.6

VERIFIED

Date of Calibration : 14-15 Oct. 2021

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FM.BL.MTC.002 Rev.4



NSC-TISTR 17025  
CALIBRATION 0037

77-TISTR

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0851

MTC No. EEL. BP. 58/0964

## 5. Frequency and time weightings at 1 kHz

### 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
A-weighting	94.0	0.0	0.20	0.4
C-weighting	94.0	0.0	0.20	0.4
Flat	94.0	0.0	0.20	0.4

### 5.2 Time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
Fast	94.0	0.0	0.20	0.3
Slow	94.0	0.0	0.20	0.3
Leq	94.0	0.0	0.20	0.3

## 6. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
125	125.0	0.0	0.30	1.4
124	124.0	0.0	0.30	1.4
123	123.0	0.0	0.30	1.4
122	122.0	0.0	0.30	1.4
121	121.0	0.0	0.30	1.4
120	120.0	0.0	0.30	1.4
119	119.0	0.0	0.30	1.4
114	114.0	0.0	0.30	1.4
109	109.0	0.0	0.30	1.4

Date of Calibration : 14-15 Oct. 2021

VERIFIED

For results, validity only to the items listed in the certificate. The results, except in full, are prohibited. Adhering the Report's criteria and validity of the results, except in full, are prohibited.

PNBL-MTC.002 Rev.4

**Head Office**  
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NSC-TISTR 17025  
CALIBRATION 0037

77-TISTR

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0851

MTC No. EEL. BP. 58/0964

## 6. Level linearity on the reference level range (continue)

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
104	104.0	0.0	0.30	1.4
99	99.0	0.0	0.30	1.4
94	94.0	0.0	0.30	1.4
89	89.0	0.0	0.30	1.4
84	84.0	0.0	0.30	1.4
79	79.0	0.0	0.30	1.4
74	74.1	0.1	0.30	1.4
69	69.0	0.0	0.30	1.4
64	64.0	0.0	0.30	1.4
59	59.0	0.0	0.30	1.4
54	54.0	0.0	0.30	1.4
49	48.9	-0.1	0.30	1.4
44	44.0	0.0	0.30	1.4
39	38.9	-0.1	0.30	1.4
34	34.0	0.0	0.30	1.4
33	32.9	-0.1	0.30	1.4
32	31.9	-0.1	0.30	1.4
31	30.9	-0.1	0.30	1.4
30	29.9	-0.1	0.30	1.4
29	28.8	-0.2	0.30	1.4
28	27.7	-0.3	0.30	1.4

VERIFIED

Date of Calibration : 14-15 Oct. 2021

For results, validity only to the items listed in the certificate. The results, except in full, are prohibited. Adhering the Report's criteria and validity of the results, except in full, are prohibited.

PNBL-MTC.002 Rev.4

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## 9. Peak C sound level

Number of cycles in test signal	Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty ( $\pm$ dB)	Tolerance limits Class 2 ( $\pm$ dB)
Complete cycle	125.4	125.0	-0.4	0.20	2.4
Positive half cycle	124.4	124.1	-0.3	0.20	1.4
Negative half cycle	124.4	124.1	-0.3	0.20	1.4

#### 10. Overload indication

	Measured value (dB)		Deviated value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
	Positive one-half cycle	Negative one-half cycle			
	135.6	135.6	0.0	0.30	1.8

VERIFIED

W. W. H. P.	DATE Dec 1, 201
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Calibrated by:

Approved by:

**Acting Director**

Electrical and Electronic Standards Laboratory  
Industrial Metrology and Testing Service Centre

Date of Calibration : 14-15 Oct. 2021

Date of Issue : 18 Oct 2021

Ref: 2011264091703872001

End of Certificate

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The results relative to the degree of vertical integration in value-added exportation are also of interest. The results are reported in Table 1. The first column reports the degree of vertical integration and the second column reports the results on the degree of vertical integration. The results show that the degree of vertical integration is positively related to the degree of vertical integration in value-added exportation. This is consistent with the findings of the literature on the effects of vertical integration on export performance.

FAM-BL-ATC-002 Rev. d

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### 7. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
40-130	125	125.0	0.0	0.30	1.4
30-120	115	115.0	0.0	0.30	1.4
20-110	105	105.0	0.0	0.30	1.4
20-100	95	95.0	0.0	0.30	1.4
20-90	85	85.0	0.0	0.30	1.4
20-80	75	75.1	0.1	0.30	1.4

### 8. Tone burst response

Time Weighting	Toneburst Duration, Tb (ms)	Measured		Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 (dB)
		Value (dB)	Value (dB)			
Fast	200	116.1	0.1	0.20	$\pm 1.3$	
	2	99.0	0.0	0.20	$+1.3; -2.8$	
	0.25	89.9	-0.1	0.20	$+1.8; -5.3$	
Slow	200	109.6	0.0	0.20	$\pm 1.3$	
	2	90.0	0.0	0.20	$+1.3; -5.3$	
	200	110.0	0.0	0.20	$\pm 1.3$	
SEL	2	90.0	0.0	0.20	$+1.3; -2.8$	
	0.25	80.9	-0.1	0.20	$+1.8; -5.3$	

VERIFIED

Date of Calibration - 14-15 Oct 2021

- 14-15 Oct. 2021

The results relate only to the first 10 years of the study.

PM 51-MTC 003 Rev. 6

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difficult alternative

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## Certificate of Calibration

**Customer**  
Name : SAC (Thailand) Limited  
Address : 100 Nanglinchare Road, Chongnont, Yamaea Bangkok 10120  
Certificate No : 22-ACT-168  
Request No : Req-2022-0423

### Unit Under Calibration Details

Measurement Item : Sound Level Meter  
Manufacturer : Cirrus  
Model : CR171B  
Serial Number : G078054  
ID :  
Resolution : 0.1 dB  
Microphone Class : 1  
Microphone Model : MK224  
Microphone S/N : 202157A  
Preamplifier Model : MK170  
Preamplifier S/N : 0805  
Instrument Status : Used

### Calibration Environment and Details

Temperature :  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$   
Humidity :  $50\% \pm 20\% \text{RH}$   
Barometric Pressure :  $1013 \text{ hPa} \pm 10 \text{ hPa}$   
Received Date : 23 February 2022  
Calibrated Date : 7 March 2022  
Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-1 : 2011 Electromechanics - Sound level meters - Part 1: Periodic tests  
Location of Calibration : Lab Acoustic

### Reference Standard

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	GRAS	40AN	185273	15 September 2022	GRAS
Multi-frequency Calibrator	Quest	Quest-cal	EFA090214	14 June 2022	TSI
Audio Generator	Scantek	Scantek01	131	18 October 2022	WK Electric

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By :

Calibration Officer

Calibration Engineer Supervisor

7 March 2022

Issue Date :

VERIFIED

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

PM-206-SLM-01 Rev.0 Issue date 01/07/19

Certificate No : 22-ACT-168  
Request No : Req-2022-0423

### 1. Indication at the calibration check frequency

LUC Setting	Nominal Level	Before Adjust		Adjust		UNCERTAINTY	Acceptance Limit
		LUC (dB)	ERR (dB)	LUC (dB)	ERR (dB)		
FAST / A, 20-140							
Calibrator Setting	(dB)	94.1	-0.02	93.9	-0.18	0.20	0.3
1000 Hz 94.00 dB							

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand Cirrus, Model CR-515, SN: 10411

### 2. Self-generated noise, Microphone installed

LUC Setting	Measured	UNCERTAINTY
FAST, 20-140	(dB)	( $\pm$ dB)
LUC Weighting		
A	16.5	0.10

### 3. Self-generated noise, Microphone replaced by the electrical input signal device

LUC Setting	Measured	UNCERTAINTY
FAST, 20-140	(dB)	( $\pm$ dB)
LUC Weighting		
A	-	0.10
C	16.1	0.10
Z	26.5	0.10

### 4. Acoustic signal test of frequency weightings (Without Windscreen)

LUC Setting	Deviation from various Frequency Weighting Response curve				UNCERTAINTY	Acceptance Limit
	A	C	Z			
FAST, 20-140	(dB)	(dB)	(dB)		( $\pm$ dB)	( $\pm$ dB)
STD Setting						
125 Hz	0.5	-0.5	0.5	0.50	1.0	1.0
1000 Hz	0.0	0.0	0.0	0.60	0.7	0.7
4000 Hz	-0.5	-0.4	-0.5	0.60	1.0	1.0
8000 Hz	-1.0	-0.8	-1.0	0.70	+1.5 -2.5	

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

PM-206-SLM-01 Rev.0 Issue date 01/07/19

Certificate No	22-ACT-168
Request No	Req-2022-0423

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

EUC setting	Deviation from various frequency				UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	FAST: 20-140 STD setting	A (dB)	C (dB)	Z (dB)		
63 Hz		0.3	0.0	0.0	0.2	1.0
125 Hz		0.2	0.1	0.0		1.0
250 Hz		0.2	0.0	0.0		1.0
500 Hz		0.1	0.0	0.0		1.0
1000 Hz		0.0	0.0	0.0		0.7
2000 Hz		-0.2	0.0	0.0		1.0
4000 Hz		-0.4	-0.2	0.0		1.0
8000 Hz		-0.5	-0.4	-0.1		+1.5, -2.5
16000 Hz		0.1	0.2	-0.4		+2.5, -16.0

## 6. Frequency and time weightings at 1kHz

EUC Setting		STD	Measured		UNCERTAINTY	Acceptance
		REF	LUC	ERR	( $\pm$ dB)	Unit
E. frequency and time weightings at 20 Hz	FASST 20-140					( $\pm$ dB)
	EUC Weighting		(dB)	(dB)		
	A	114.00	114.0	0.0		0.2
	C	114.00	114.0	0.0	0.2	0.2
	Z	114.00	114.0	0.0		0.2

UUC Scoring	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		REF (dB)	ERR (dB)		
20 (dB) / A		114.00	0.0		0.1
UUC Time Response		114.00	0.0	0.2	0.1
Fast		114.00	0.0		
Slow		114.00	0.0		
1.00		114.00	0.0		0.1

The results related only to the items elaborated. The certificate shall not be reproduced except in full, without written approval of the Insurance Government (10, 1 Jul 1912, 101-4-14-11). Rev. D. (June 1912) 01/07/19

## 7. Long Term Stability

Long-term accuracy	Measured	Uncertainty ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
<div> <div> LUC Setting</div> <div>FAST A, 20-140</div> <div>STD Setting</div> </div> <div> <div>Initial</div> <div>Final</div> <div>Deviated</div> </div>	<div>LUC</div> <div>0 dB</div> <div>314.0</div> <div>314.0</div> <div>0.0</div>	<div>(<math>\pm</math> dB)</div> <div></div> <div></div> <div></div> <div>0.3</div>	<div></div> <div></div> <div></div> <div></div> <div>0.1</div>

### 8. Level linearity on the reference level range

UUC Setting		Anticipated REF (dB)	Deviation		UNCERTAINTY (+/- dB)	Acceptance Limit (+/- dB)
FAST (A, 20-40)	STD dB		UUC (dB)	ERR (dB)		
	130.00	139	136.0	0.0		0.8
	134.00	134	134.0	0.0		0.8
	129.00	129	129.0	0.0		0.8
	124.00	124	124.0	0.0		0.8
	119.00	119	119.0	0.0		0.8
	114.00	114	114.0	0.0		0.8
	109.00	109	109.0	0.0		0.8
	104.00	104	104.0	0.0		0.8
	99.00	99	99.0	0.0		0.8
	94.00	94	94.1	-0.1		0.8
	89.00	89	89.1	-0.1		0.8
	84.00	84	84.0	0.0	0.3	0.8
	79.00	79	79.1	-0.1		0.8
	74.00	74	74.1	-0.1		0.8
	69.00	69	69.1	-0.1		0.8
	64.00	64	64.1	-0.1		0.8
	59.00	59	59.1	-0.1		0.8
	54.00	54	54.1	-0.1		0.8
	49.00	49	49.1	-0.1		0.8
	44.00	44	44.1	-0.1		0.8
	39.00	39	39.1	-0.1		0.8
	34.00	34	34.1	-0.1		0.8
	29.00	29	29.1	-0.1		0.8
	24.00	24	23.9	-0.1		0.8

The results related only to the items highlighted. The certification shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.



Certificate No : 22-ACT-168  
Request No : Req-2022-0423

#### 9. Level linearity including the level range control

UUC Setting	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST A					
UUC Range	25.4	25.4	0.0	0.3	0.8
20-140	11.4	114.0	0.0		0.8

#### 10. Tone burst response

UUC Setting	STD Tonsburst (ms)	Anticipated		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		Ref (dB)		UUC (dB)	ERR (dB)		
A : 20-140							
UUC Time Response							
Fast	200	136.0		136.0	0.0		0.5
	2	119.0		118.9	-0.1		+1.0, -1.5
	0.25	110.0		109.8	-0.2		+1.0, -3.0
Slow	200	129.6		129.6	0.0		0.5
	2	110.0		110.0	0.0		+1.0, -3.0
	200	130.0		130.0	0.0		0.5
SEL	2	110.0		110.0	0.0		+1.0, -1.5
	0.25	101.0		100.9	-0.1		+1.0, -3.0

#### 11. Peak C Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST C : 20-140					
STD Setting					
Complete cycle	135.4	135.6	+0.20		2.0
Positive half cycle	134.4	134.2	-0.20	0.2	1.0
Negative half cycle	134.4	134.2	-0.20		1.0

The results related only to the items mentioned. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PIN: 708-54.M.01 Rev. 6 Issue Date 01/07/18

Certificate No : 22-ACT-168  
Request No : Req-2022-0423

#### 12. Overload indication

UUC Setting	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST A : 20-140			
STD Setting			
Positive one-half cycle	140.9		
Negative one-half cycle	140.9		
Deviated	0.0	0.2	1.5

#### 13. High Level Stability

UUC Setting	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST A : 20-140			
STD Setting			
Initial	139.0		
Final	139.0		
Deviated	0.0	0.1	0.1

End of Certificate

The results related only to the items mentioned. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PIN: 708-54.M.01 Rev. 6 Issue Date 01/07/18

Certificate of Calibration

Customer

Name : SCGS (Thailand) Limited.

Address : 100 Nangliachoe Road, Chongpradit, Yamaa Bangkok 10120

Certificate No : 22-ACT-366

Request No : Req-2022-0948

Unit Under Calibration Details

Measurement item : Sound Level Meter

Manufacturer : Cirrus

Model : CR-161B

Serial Number : G078569

ID : -

Resolution : 0.1 dB

Calibration Environment and Details

Temperature : 23 °C ± 2 °C

Humidity : 50 %RH ± 20 %RH

Barometric Pressure : 1013 hPa ± 10 MPa

Received Date : 24 May 2022

Calibrated Date : 8 June 2022

Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-1 : 2013 Electroacoustics - Sound level meters - Part 1: Periodic tests

Location of Calibration : Lab Acoustic

Microphone Chain : 1

Microphone Model : MK224

Microphone S/N : 210664D

Preamplifier Model : K36-170

Preamplifier S/N : 0832

Instrument Status : Used

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Multifrequency Calibrator	Quest	Quest-cal	EFA000234	14 June 2022	TSI
Audio Generator	Svante	Scas401	131	18 October 2022	WK Electric

**Note**  
The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated by : [Redacted]

Calibration Officer

VERIFIED

Issue Date : 8 June 2022

Calibration Engineer Supervisor

Certificate No : 22-ACT-366  
Request No : Req-2022-0948

1. Indication at the calibration check frequency					
UUC Setting	Nominal		Before Adjust		Acceptance Limit
	Level (dB)	Level (dB)	UUC (dB)	ERR (dB)	
FAST / A / 20-140					
Calibrator Setting					
1000 Hz 94.00 dB	94.13	93.6	-0.53	-0.23	0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTER, Model SV 36, SN. 10402

2. Self-generated noise, Microphone Installed		
UUC Setting	Measured	UNCERTAINTY
FAST / 20-140		
UUC Weighting	(dB)	(± dB)
A	18.8	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device		
UUC Setting	Measured	UNCERTAINTY
FAST / 20-140		
UUC Weighting	(dB)	(± dB)
A	-	0.10
C	19.9	0.10
Z	32.8	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)					
UUC Setting	Deviation from various Frequency Weighting Response curve				Acceptance Limit
	A	C	Z	UNCERTAINTY	
FAST / 20-140	(dB)	(dB)	(dB)	(± dB)	(± dB)
STD Setting					
125 Hz	0.4	0.2	0.2	0.50	1.0
1000 Hz	0.0	0.0	0.0	0.60	0.7
4000 Hz	0.0	0.2	0.4	0.60	1.0
8000 Hz	0.4	0.5	0.8	0.70	+1.5 -2.5

Certificate No : 22-ACT-366  
Request No : Req-2022-0948

5. Electrical signal test of frequency weightings. Weighting network response with relative to 1 Hz

UUC Setting	Deviation from various Frequency				UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	Weighting Response curve					
FAST / 20-140	A (dB)	C (dB)	Z (dB)			
STD Setting						
63 Hz	0.4	0.1	0.1		0.2	1.0
125 Hz	0.3	0.1	0.1			1.0
250 Hz	0.3	0.1	0.1			1.0
500 Hz	0.2	0.1	0.1			1.0
1000 Hz	0.0	0.1	0.1			0.7
2000 Hz	-0.1	0.1	0.1		1.0	
4000 Hz	-0.3	-0.1	0.1		1.0	
8000 Hz	-0.4	-0.3	0.0			+1.5, -2.5
16000 Hz	0.3	0.4	-0.2			+2.5, -16.0

6. Frequency and time weightings at 1kHz

UUC Setting	STD		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	REF		UUC	ERR		
FAST / 20-140						
UUC Weighting						
A	114.00	114.0	114.0	0.0	0.2	0.2
C	114.00	114.0	114.0	0.0	0.2	0.2
Z	114.00	114.0	114.0	0.0	0.2	0.2

UUC Setting	STD		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	REF		UUC	ERR		
20-140 / A						
UUC Time Response						
Fast	114.00	114.0	114.0	0.0	0.1	0.1
Slow	114.00	114.0	114.0	0.0	0.1	0.1
Leq	114.00	114.0	114.0	0.0	0.1	0.1

7. Long Term Stability

UUC Setting	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST / A / 20-140	UUC (dB)		
STD Setting				
Initial		114.0		
Final		114.0		
Deviated		0.0	0.1	0.1

8. Level linearity on the reference level range

UUC Setting	Anticipated		Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST / A / 20-140	REF (dB)	UUC (dB)	ERR (dB)		
STD dB						
139.00		139	138.9	-0.1		0.8
134.00		134	134.0	0.0		0.8
129.00		129	129.0	0.0		0.8
124.00		124	124.0	0.0		0.8
119.00		119	119.0	0.0		0.8
114.00		114	114.0	0.0		0.8
109.00		109	108.9	-0.1		0.8
104.00		104	104.0	0.0		0.8
99.00		99	99.0	0.0		0.8
94.00		94	94.0	0.0		0.8
89.00		89	89.0	0.0		0.8
84.00		84	84.0	0.0	0.3	0.8
79.00		79	79.0	0.0		0.8
74.00		74	74.0	0.0		0.8
69.00		69	69.0	0.0		0.8
64.00		64	64.0	0.0		0.8
59.00		59	59.0	0.0		0.8
54.00		54	54.0	0.0		0.8
49.00		49	49.0	0.0		0.8
44.00		44	44.0	0.0		0.8
39.00		39	39.0	0.0		0.8
34.00		34	34.0	0.0		0.8
29.00		29	28.9	-0.1		0.8
24.00		24	23.8	-0.2		0.8



Certificate No : 22-ACT-166  
 Request No : Req-2022-0948

#### 9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST / A	REF (dB)	25.4	0.2	0.3	0.8
UUC Range		114.0	0.0		0.8

#### 10. Tone burst response

UUC Setting	STD	Anticipated Ref (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
			UUC (dB)	ERR (dB)		
A / 20-140 UUC Time Response	Touchstart (ms)	200	126.0	126.0	0.0	0.5
		2	119.0	118.8	-0.2	+1.0, -1.5
		0.25	110.0	109.9	-0.1	+1.0, -3.0
Fast		200	129.6	129.6	0.0	0.5
		2	110.0	110.0	0.0	+1.0, -3.0
		0.25	100.0	100.9	-0.1	+1.0, -3.0
Slow		200	130.0	130.0	0.0	0.5
		2	110.0	110.0	0.0	+1.0, -1.5
		0.25	101.0	100.9	-0.1	+1.0, -3.0
SEL		200	130.0	130.0	0.0	0.5
		2	110.0	110.0	0.0	+1.0, -1.5
		0.25	101.0	100.9	-0.1	+1.0, -3.0

#### 11. Peak C-Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST / C / 20-140		135.4	+0.10	2.0	1.0
STD Setting		134.4	-0.20	1.0	1.0
Complete cycle		134.4	-0.20	1.0	1.0
Positive half cycle		134.4	-0.20	1.0	1.0
Negative half cycle		134.4	-0.20	1.0	1.0

#### 12. Overload indication

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 20-140	UUC (dB)		
STD Setting			
Positive one-half cycle	145.9		
Negative one-half cycle	145.9		
Deviated	0.0	0.2	1.5

#### 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 20-140	UUC (dB)		
STD Setting			
Initial	139.0		
Final	139.0		
Deviated	0.0	0.1	0.1

End of Certificate

EN5149176

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ACCREDITED  
Calibration of  
AC 2963  
Page 1 of 2

Certificate of Calibration

**Customer**  
Name : SGS (Thailand) Limited.  
Address : 100 Nanglinchee Road, Chongmonsi, Yamaswa Bangkok  
10120

Certificate No : 22-ACT-387  
Request No : Req-2022-1062

Unit Under Calibration Details

Measurement item : Acoustic Calibrator  
Manufacturer : Cirrus  
Model : CR-515  
Serial Number : 88373  
ID : -

Class : 1  
Range : 94 dB / 1000 Hz  
Instrument Status : Used

Calibration Environment and Details

Temperature : ( 23 ± 2 °C )  
Humidity : ( 50 ± 20 %RH )  
Barometric Pressure : ( 1013 ± 10.0 hPa )  
Received Date : 9 June 2022  
Calibration Date : 10 June 2022

Location of Calibration : LAB 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators



Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEL	31 May 2023
THD Multimeter	2015	1047765	NIMT	2 February 2023

**Traceability** : This certificate provides traceability of measurement to recognized national standard, and to the realization of the International System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Calibrated By :



Service Calibration Engineer  
Calibration Engineer Supervisor  
Issue Date : 10 June 2022

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Page 2 of 2

Certificate No : 22-ACT-387

Request No : Req-2022-1062

Calibration Results : Without Adjustment

Sound pressure level

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)
	Measured	Error	Measured	Error		
94 dB / 1000 Hz	93.76	-0.24	-	-	0.11	0.25

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (Hz)	Error (%)	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	1000.00	0.00	-	-	0.10	0.70

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (%)	Error (%)	Measured (%)	Error (%)		
94 dB / 1000 Hz	0.08	-	-	-	0.40	2.5

Note :

- Acceptance limit was IEC 60942:2017 Class 1
- The calibration results exclude the calibrator pressure correction
- The calibration results exclude the microphone volume correction

End of Calibration



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-640317

MTC No. EEL. BP. 26/0164

## CALIBRATION CERTIFICATE

Submitted by : SGS (Thailand) Limited.

Address : 100 Nangliachae Road, Chongnonsue, Yunnan, Bangkok, 10120.

Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.

Sat 1C, Bangpoo Industrial Estate, Sukhumvit Rd., A.Muang, Samutprakarn 10280.

### Instrument Calibrated :

Description : Sound Level Meter

Manufacturer : Rion

Model : NL-21

Serial No. : 00965939

Microphone : Type UC-52 No.125433

Preamplifier : Type NH-21 No.30226

### Standards used :

1. Band Pass Filter Stanford Research Systems SR 650 S/N 28712.
2. Condenser Microphone Brüel&Kjær 4180 S/N 2889871.
3. Decade Attenuator Ando AL-205 S/N 00464602.
4. Function/Arbitrary Waveform Generator Agilent 33220A S/N MY44042668.
5. Digital Function Synthesizer NF Electronic Instruments DF-193A S/N 122037.
6. Digital Multimeter Fluke 8520A S/N 4985007.
7. Multifunction Acoustic Calibrator Brüel&Kjær 4226 S/N 2810358.
8. Measuring Amplifier Brüel&Kjær 2636 S/N 1537484.

VERIFIED

Date of Receipt : 7 Jan. 2021

Date of Calibration : 27-28 Jan. 2021

Adopting the Report Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the government.

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FM.BL.MTC.002 Rev.3



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-640217

MTC No. EEL. BP. 26/0164

9. Power Amplifier Brüel&Kjær 2706 S/N 1517650.
10. Speaker Tannoy Limited, Great Britain Patent No. 215300.
11. Digital Multimeter Agilent 34401A S/N MY44005560.
12. Programmable Attenuator Tamagawa TPA-303A S/N 2212.

### Calibration Procedure :

This instrument was calibrated by using calibration procedures no CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electroacoustics - Sound Level Meters - Part 3 : Periodic tests (2006). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out with the direct measurement method. The acoustic signal test was performed in an anechoic room with the comparison measurement method.

This instrument has been calibrated against standards maintained at the Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

Date of Calibration : 27-28 Jan. 2021

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0217

MTC No. EEL. BP. 26/0164

### 1. Absolute Sensitivity

Reference Acoustic Signal (dB)	Unit Under Test				Tolerance Limit Class 2 ( $\pm$ dB)
	Measured Value (dB)		Deviation (dB)	Uncertainty ( $\pm$ dB)	
	Before adjust	After adjust			
113.94	114.3	113.9	0.0	0.30	1.4

Note: The external calibration adjustment was firstly performed. The internal calibration adjustment was then completed at the display of 114.9 dB.

### 2. Self-generated noise

#### 2.1 Normal test

Measured value (dB)	Uncertainty ( $\pm$ dB)
19.8	0.10

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

Frequency	Measured Value (dB)	Uncertainty ( $\pm$ dB)
Weighting		
A-Weighting	14.2	0.10
C-Weighting	19.9	0.10
Flat	25.7	0.10

Date of Calibration : 27-28 Jan. 2021

The results relate only to the items tested or calibrated.  
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FM-BL-MTC.002 Rev.3

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0217

MTC No. EEL. BP. 26/0164

### 3. Acoustical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Tolerance Limits Class 2 ( $\pm$ dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)	
125	0.3	0.4	0.2	0.40
1 000	-0.4	-0.4	-0.3	0.40
4 000	-1.7	-1.7	-1.8	0.40

### 4. Electrical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Tolerance Limits Class 2 ( $\pm$ dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)	
63	0.0	-0.2	-0.1	0.20
125	-0.1	0.0	-0.1	0.20
250	-0.1	-0.1	-0.1	0.20
500	-0.1	0.0	0.0	0.20
1 000	0.0	0.0	0.0	0.20
2 000	0.0	0.1	0.2	0.20
4 000	0.0	0.1	0.2	0.20
8 000	0.3	0.3	0.2	0.20

Date of Calibration : 27-28 Jan. 2021

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Request No. 21-64-0217

MTC No. EEL BP. 26/0164

### 5. Frequency and time weightings at 1 kHz

#### 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
A-weighting	94.0	0.0	0.20	0.4
C-weighting	94.0	0.0	0.20	0.4
Flat	94.0	0.0	0.20	0.4

#### 5.2 Time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
Fast	94.0	0.0	0.20	0.3
Slow	94.0	0.0	0.20	0.3
Leq	94.0	0.0	0.20	0.3

#### 6. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
125	125.0	0.0	0.30	1.4
124	124.1	0.1	0.30	1.4
123	123.1	0.1	0.30	1.4
122	122.0	0.0	0.30	1.4
121	121.0	0.0	0.30	1.4
120	120.0	0.0	0.30	1.4
119	119.0	0.0	0.30	1.4
114	114.0	0.0	0.30	1.4
109	109.0	0.0	0.30	1.4

Date of Calibration : 27-28 Jan. 2021

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CALIBRATION 0037

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64-0217

MTC No. EEL BP. 26/0164

### 6. Level linearity on the reference level range (cont.)

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
104	104.0	0.0	0.30	1.4
99	99.0	0.0	0.30	1.4
94	94.0	0.0	0.30	1.4
89	89.0	0.0	0.30	1.4
84	84.1	0.1	0.30	1.4
79	79.1	0.1	0.30	1.4
74	74.1	0.1	0.30	1.4
69	69.0	0.0	0.30	1.4
64	64.0	0.0	0.30	1.4
59	59.0	0.0	0.30	1.4
54	54.0	0.0	0.30	1.4
49	49.1	0.1	0.30	1.4
44	44.1	0.1	0.30	1.4
39	38.9	-0.1	0.30	1.4
34	34.0	0.0	0.30	1.4
33	33.0	0.0	0.30	1.4
32	31.9	-0.1	0.30	1.4
31	31.0	0.0	0.30	1.4
30	29.9	-0.1	0.30	1.4
29	28.9	-0.1	0.30	1.4
28	27.9	-0.1	0.30	1.4

Date of Calibration : 27-28 Jan. 2021

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Request No. 21-64/0217

MTC No. EEL, BP. 26/0164

7. Level linearity including the level range control

Range	Anticipated Value (dB)		Deviated Value (dB)	Tolerance Limits	
	Value (dB)	Uncertainty ( $\pm$ dB)	Value (dB)	Uncertainty ( $\pm$ dB)	Class 2 ( $\pm$ dB)
40-130	125	0.30	0.0	0.30	1.4
30-120	115	0.30	0.0	0.30	1.4
20-110	105	0.30	0.0	0.30	1.4
20-100	95	0.30	0.0	0.30	1.4
20-90	85	0.30	0.1	0.30	1.4
20-80	75	0.30	0.1	0.30	1.4

8. Tone burst response

Time Weighting	Toneburst Duration, T <sub>b</sub> (ms)		Deviated Value (dB)	Tolerance Limits	
	Value (dB)	Uncertainty ( $\pm$ dB)	Value (dB)	Uncertainty ( $\pm$ dB)	Class 2 (dB)
Fast	200	0.20	0.0	0.20	$\pm 1.3$
	2	0.20	-0.1	0.20	$+1.3; -2.8$
	0.25	0.20	-0.1	0.20	$+1.8; -5.3$
Slow	200	0.20	0.0	0.20	$\pm 1.3$
	2	0.20	0.0	0.20	$+1.3; -5.3$
	0.25	0.20	0.0	0.20	$+1.3; -5.3$

Date of Calibration : 27-28 Jan. 2021

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Request No. 21-64/0217

MTC No. EEL, BP. 26/0164

9. Peak C sound level

Number of cycles in test signal	Anticipated value (dB)		Deviated value (dB)	Tolerance Limits	
	Value (dB)	Uncertainty ( $\pm$ dB)	Value (dB)	Uncertainty ( $\pm$ dB)	Class 2 ( $\pm$ dB)
Complete cycle	125.4	0.20	-0.4	0.20	2.4
Positive half cycle	124.4	0.20	-0.3	0.20	1.4
Negative half cycle	124.4	0.20	-0.3	0.20	1.4

10. Overload indication

Measured value (dB)		Deviated value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits
Positive one-half cycle	Negative one-half cycle			
135.6	135.6	0.0	0.30	1.8

Calibrated by :

Approved by :

Electrical and Electronic Standards Laboratory  
Industrial Metrology and Testing Service Centre

Date of Calibration : 27-28 Jan. 2021

Date of Issue : 4 Feb. 2021

Ref : 2011264010700062009

End of Certificate

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0217 MTC No. EEL BP. 29/0164

### CALIBRATION CERTIFICATE

Submitted by : SGS (Thailand) Limited.  
Address : 100 Nangliachae Road, Chongnasee, Yamawa, Bangkok, 10120.  
Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.  
Sol 1C, Bangpoo Industrial Estate, Sukhumvit Rd., A.Muang, Samutprakan 10280.

#### Instrument Calibrated :

Description	Sound Level Meter	Temperature	(23 ± 3) °C
Manufacturer	Rson	Relative Humidity	(50 ± 15) %
Model	NL-21	Ambient Pressure	(101.325 ± 1.5) kPa

Serial No. : 00398395

Microphone : Type UC-52 No.177386

Preamplifier : Type NH-21 No.30053

#### Standards used :

1. Band Pass Filter Stanford Research Systems SR 650 S/N 28712.
2. Condenser Microphone Brüel&Kjær 4180 S/N 2889871.
3. Decade Attenuator Ando AL-205 S/N 00464602.
4. Function/Arbitrary Waveform Generator Agilent 33220A S/N MY44042668.
5. Digital Function Synthesizer NF Electronic Instruments DF-193A S/N 122037.
6. Digital Multimeter Fluke 8520A S/N 4985007.
7. Multifunction Acoustic Calibrator Brüel&Kjær 4226 S/N 2810358.
8. Measuring Amplifier Brüel&Kjær 2636 S/N 1537484.

VERIFIED

Date of Receipt : 7 Jun. 2021

Date of Calibration : 27-28 Jan. 2021

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64/0217 MTC No. EEL BP. 29/0164

9. Power Amplifier Brüel&Kjær 2706 S/N 1517650.
10. Speaker Tannoy Limited, Great Britain Patent No. 215300.
11. Digital Multimeter Agilent 34401A S/N MY44005560.
12. Programmable Attenuator Tamagawa TPA-303A S/N 2212.

#### Calibration Procedure :

This instrument was calibrated by using calibration procedures no CP-102-02 and CP-102-03, which were based on IEC 61672-3 Electroacoustics - Sound Level Meters - Part 3 : Periodic tests (2006). These calibration procedures were related to the electrical and acoustic signal tests. The electrical signal test was carried out with the direct measurement method. The acoustic signal test was performed in an anechoic room with the comparison measurement method.

This instrument has been calibrated against standards maintained at the Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only.

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Date of Calibration : 27-28 Jan. 2021

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64-0217

MTC No. EEL. BP. 29/0164

### 1. Absolute Sensitivity

Reference Acoustic Signal (dB)	Unit Under Test				Tolerance Limit Class 2 ( $\pm$ dB)
	Measured Value (dB)		Deviation (dB)	Uncertainty ( $\pm$ dB)	
	Before adjust	After adjust			
113.94	114.1	113.9	0.0	0.30	1.4

Note: The external calibration adjustment was firstly performed. The internal calibration adjustment was then completed at the display of 114.7 dB.

### 2. Self-generated noise

#### 2.1 Normal test

Measured value (dB)	Uncertainty ( $\pm$ dB)
24.3	0.10

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

Frequency	Measured Value (dB)	Uncertainty ( $\pm$ dB)
Weighting		
A-Weighting	16.6	0.10
C-Weighting	22.5	0.10
Flat	27.8	0.10

Date of Calibration : 27-28 Jan. 2021

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THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-64-0217

MTC No. EEL. BP. 29/0164

### 3. Acoustical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
125	0.3	0.3	0.2	0.40	2.0
1 000	-0.3	-0.5	-0.4	0.40	1.4
4 000	-1.2	-0.9	-1.1	0.40	3.6

### 4. Electrical signal test of frequency weightings

Frequency (Hz)	Deviation from response curve			Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
	A-weighting (dB)	C-weighting (dB)	Flat (dB)		
63	0.0	-0.2	-0.2	0.20	2.5
125	-0.2	-0.1	-0.1	0.20	2.0
250	0.0	0.0	0.0	0.20	1.9
500	-0.1	0.0	0.0	0.20	1.9
1 000	0.0	0.0	0.0	0.20	1.4
2 000	0.0	0.1	0.1	0.20	2.6
4 000	0.0	0.0	0.1	0.20	3.6
8 000	0.2	0.3	0.1	0.20	5.6

Date of Calibration : 27-28 Jan. 2021

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NSC-TISTR 115 1025  
CALIBRATION 0017

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

MTC No. EEL-BP-29/0164

Request No. 21-64/0217

## 5. Frequency and time weightings at 1 kHz

### 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
A-weighting	94.0	0.0	0.20	0.4
C-weighting	94.0	0.0	0.20	0.4
Flat	94.0	0.0	0.20	0.4

### 5.2 Time weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
Fast	94.0	0.0	0.20	0.3
Slow	94.0	0.0	0.20	0.3
Leq	94.0	0.0	0.20	0.3

## 6. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
125	125.0	0.0	0.30	1.4
124	124.0	0.0	0.30	1.4
123	123.0	0.0	0.30	1.4
122	122.0	0.0	0.30	1.4
121	121.0	0.0	0.30	1.4
120	120.0	0.0	0.30	1.4
119	119.0	0.0	0.30	1.4
114	114.0	0.0	0.30	1.4
109	109.0	0.0	0.30	1.4

Date of Calibration : 27-28 Jan. 2021

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## 6. Level linearity on the reference level range (cont.)

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty ( $\pm$ dB)	Tolerance Limits Class 2 ( $\pm$ dB)
104	104.0	0.0	0.30	1.4
99	99.0	0.0	0.30	1.4
94	94.0	0.0	0.30	1.4
89	89.0	0.0	0.30	1.4
84	84.1	0.1	0.30	1.4
79	79.0	0.0	0.30	1.4
74	74.0	0.0	0.30	1.4
69	69.0	0.0	0.30	1.4
64	64.0	0.0	0.30	1.4
59	58.9	-0.1	0.30	1.4
54	54.0	0.0	0.30	1.4
49	48.9	-0.1	0.30	1.4
44	44.0	0.0	0.30	1.4
39	38.9	-0.1	0.30	1.4
34	33.9	-0.1	0.30	1.4
33	33.0	0.0	0.30	1.4
32	31.9	-0.1	0.30	1.4
31	31.0	0.0	0.30	1.4
30	29.9	-0.1	0.30	1.4
29	28.9	-0.1	0.30	1.4
28	27.9	-0.1	0.30	1.4

Date of Calibration : 27-28 Jan. 2021

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7. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
40-140	125	125.0	0.0	0.30	1.4
30-120	115	115.0	0.0	0.30	1.4
20-110	105	105.0	0.0	0.30	1.4
20-100	95	95.0	0.0	0.30	1.4
20-90	85	85.1	0.1	0.30	1.4
20-80	75	75.1	0.1	0.30	1.4

8. Tone burst response

Time Weighting	Toneburst Duration, T <sub>b</sub> (ms)	Measured Value (dB)	Deviated Value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (dB)
Fast	200	116.0	0.0	0.20	±1.3
	2	98.9	-0.1	0.20	+1.3; -2.8
	0.25	89.9	-0.1	0.20	+1.8; -5.3
Slow	200	109.6	0.0	0.20	±1.3
	2	90.0	0.0	0.20	+1.3; -5.3
	200	110.0	0.0	0.20	±1.3
SEL	2	90.0	0.0	0.20	+1.3; -2.8
	0.25	80.9	-0.1	0.20	+1.8; -5.3

Date of Calibration : 27-28 Jan. 2021

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9. Peak C sound level

Number of cycles in test signal	Anticipated value (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
Complete cycle	125.4	125.0	-0.4	0.20	2.4
Positive half cycle	124.4	124.1	-0.3	0.20	1.4
Negative half cycle	124.4	124.1	-0.3	0.20	1.4

10. Overload indication

Measured value (dB)		Deviated value (dB)	Uncertainty (±dB)	Tolerance Limits Class 2 (±dB)
Positive one-half cycle	135.6	0.0	0.30	1.8
Negative one-half cycle	135.6	0.0	0.30	1.8

Calibrated by :



Approved by :



(Mg. Wajeeh Kijpana)  
Acting Director

Electrical and Electronic Standards Laboratory  
Industrial Metrology and Testing Service Centre

Date of Calibration : 27-28 Jan. 2021

Date of Issue : 4 Feb. 2021

Ref : 201264010700062012

End of Certificate

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## Meter Console Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 23/10/2021  
Instrument Brand : Apex / Model 572 Calibrated By : OC

### Wet gas meter information

Wet gas Brand : Shingawa Wet gas S/N : 544122  
Wet gas Model : WI-NK-2.5A Expire Date : 27 July 2022

Orifice Setting $\Delta H @$ (mm H <sub>2</sub> O)	Wet gas		Metering System		Time (min)	YI	$\Delta H @$
	V <sub>w</sub> (L)	T <sub>w</sub> (°C)	V <sub>a</sub> (L)	T <sub>m</sub> (°C)			
13	135.32	25.3	140.0	25.5	12-13	0.9661	50.230
13	135.82	25.1	140.0	25.0	12-12	0.9686	49.758
26	135.26	25.0	140.0	25.0	8-29	0.9637	48.546
26	134.99	25.1	140.0	25.5	8-28	0.9633	48.477
40	269.41	24.9	280.0	25.0	13-29	0.9588	47.687
40	268.05	24.9	280.0	24.5	13-27	0.9525	47.898
50	267.05	24.8	280.0	24.0	11-56	0.9467	47.579
50	266.19	24.7	280.0	24.0	11-55	0.9438	47.738
70	265.81	24.7	280.0	24.5	10-01	0.9422	47.369
70	265.93	24.7	280.0	24.0	10-01	0.9411	47.404
90	264.26	24.6	280.0	24.0	8-53	0.9337	48.603
90	264.10	24.6	280.0	24.0	8-51	0.9333	48.281
Average							48.269

Remark : YI  $\leq \pm 0.02$  from average  
YI = 1.00  $\pm$  0.05  
 $\Delta H @ \leq 5.08$  mm H<sub>2</sub>O from average  
 $\Delta H @ = 46.7 \pm 6.4$  mm H<sub>2</sub>O

Checked By :

Position :  
Date :

Operation Manager  
Date : 25 / 10 / 2021

Approved By :

Position :  
Date : 25 / 10 / 2021

Technical Manager



## Manometer Verification

Dry Gas Meter ID. : ENSS 16114 Date of Calibration : 23/10/2021  
Instrument Brand : Apex / Model 572 Calibrated By : OC.MW

### Manometric gauge information

Manometric Brand : Dwyer Industries, Inc. Manometric S/N : R060822A1109  
Manometric Model : 2000-100MM Expire Date : 14/10/2022

Manometer data				
Test No.	Manometer Reference $\Delta P$ (mm H <sub>2</sub> O):A	Manometer monitoring $\Delta P$ (mm H <sub>2</sub> O):B	Difference	Reference/Monitoring A/B
1	2.0	2.0	0.00	1.00
2	6.0	6.0	0.00	1.00
3	10.0	10.0	0.00	1.00
4	16.0	16.5	0.50	0.97
5	20.0	20.0	0.00	1.00
Average			0.10	0.99

Remark : [ Reference(Avg) / Monitoring(Avg) ] must be = 0.95 to 1.05

Checked By :

Position :  
Date :

Operation Manager  
Date : 25 / 10 / 2021

Approved By :

Position :  
Date : 25 / 10 / 2021

Technical Manager

## Temperature Display Verification

Dry Gas Meter ID. : ENS5 16114 Date of Calibration : 23/10/2021  
Instrument Brand : Apex / Model 572 Calibrated By : MW

## Temperature Simulator Information

Simulator Brand : Handy Cal Simulator S/N : TIL1015  
Simulator Model : CA11E Expire Date : 15/06/2022

Standard Value	Instrument Display				
	Stack	Probe	Filter	Aux	Exit
300	299	299	298	298	-
200	200	199	198	198	-
150	151	150	148	149	-
100	101	101	99	99	102
50	50	50	49	49	51
0	0	0	0	0	0
Difference	0.4 %	1.0	2.0	2.0	2.0

Remark : Stack  $\leq \pm 1.5$  % Absolute Aux  $\leq \pm 3.0$  °C  
Probe  $\leq \pm 3.0$  °C Exit  $\leq \pm 3.0$  °C  
Filter  $\leq \pm 3.0$  °C

Checked By :

Approved By :

Position :

Position : Technical Manager

Date :

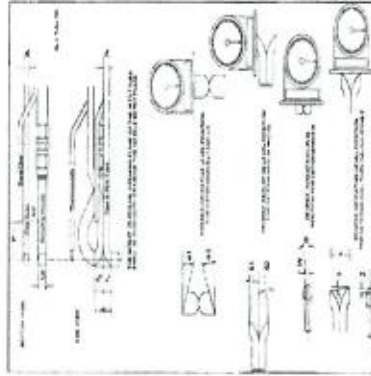
Date : 25/10/2021

Operation Manager

Date : 25/10/2021

## Certificate of Calibration

S-Type Generative Pilot Tube Calibration  
See the Code of Federal Regulations, Title 40, Part 60, Appendix A,  
Method 2, item 4



Pilot tube/Probe No. : No.35/A8461

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or y	PASS
Ports Damaged?	N	No or n	PASS
$\alpha 1$	-3.2	$-10^\circ < \alpha 1 < +10^\circ$	PASS
$\alpha 2$	-3.4	$-10^\circ < \alpha 2 < +10^\circ$	PASS
$\beta 1$	-3.5	$-5^\circ < \beta 1 < +5^\circ$	PASS
$\beta 2$	-0.8	$-5^\circ < \beta 2 < +5^\circ$	PASS
T	3.4	N/A	-
$\theta$	1.6	N/A	-
$\theta_1$	0.375	0.188" to 0.375"	PASS
A	1.124	2 ID <sub>1</sub> $\leq A \leq 3$ ID <sub>1</sub>	PASS
A/2D <sub>1</sub>	1.498	1.05 $\leq A/D_1 \leq 1.5$	PASS
Z = A tan $\theta$	0.067	Z $\leq 0.125$ "	PASS
W = A tan $\theta$	0.031	W $\leq 0.031$ "	PASS

I certify that pilot tube/probe \_\_\_\_\_ No. 35/A8461 \_\_\_\_\_ meets or exceeds all specifications, criteria and/or applicable design tolerances and is hereby assigned a pilot tube certification factor of 0.84. See 40 CFR Pt. 60, App A, EPA Method 2.

Standard Device  
Device Name : Digital inclinometer  
Manufacturer : BASSELINE  
Model : 12-1057  
ID No. : \_\_\_\_\_

Expiration date : 07-Dec-22  
ENSS No. : ENSS 22159

Certified by :

Approved by :

Date

Date



## CERTIFICATE OF CALIBRATION

Certificate No.: T0-0908009/21 Page 1 of total 2 pages

**Customer**  
SGS (THAILAND) LIMITED  
100 Nanglinchee Road, Chongnonsi,  
Yamawa, Bangkok 10120 Thailand

**Equipment**  
**Manufacturer** HANNA  
**Model** HI98195  
**Serial No.** 04260060101  
**Description** Digital Thermometer with Probe  
ID No. ENWA19103  
Temperature range : 20 °C to 40 °C, Resolution of UUC : 0.01 °C

**Environmental Conditions**  
Ambient Temperature: (23 ± 3) °C  
Relative Humidity: (50 ± 15) %  
Atmospheric Pressure: -

**Calibration Location**  
Blue Devils Laboratory (TL)  
**Received Date** 9 August 2021  
**Calibration Date** 9 August 2021  
**Date of Issue** 10 August 2021

**Checked by** [Redacted]  
**Approved by** [Redacted]  
Representative of Managing Director  
( Dr. Ekachai Puttitwong )  
**Act as Technical Manager**  
( ) ( Krityosi K. ) ( ) ( Sakda Y. )  
( ) ( Patiphan K. ) ( ) ( Onnapa P. )  
( ) ( Pongsak H. ) ( ) ( Nitiphong K. )  
( ) ( Kanung C. ) ( ) ( Noonthachai K. )  
( ) ( Pramong P. ) ( ) ( Noppol P. )

VERIFIED

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

FE-169

REV.02 02/24/21

Certificate No.: T0-0908009/21 Page 2 of total 2 pages

**Reference Method:**

- The calibration method used was CP-096 based on an in-house method.
- The temperature scale used was an ITS-90.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard Instruments:**

Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Thermometer Readout	1529-R	B7C853	20E3985	Nov. 9, 2021	TPA
Platinum Resistance Thermometer	5626	4853	C0A30046	Oct. 28, 2023	FLUKE
Liquid Bath	XORTS-40A	XO111019	10-0306002/21	Jun. 3, 2023	THC

**Remark:** This certificate is traceable to the International System of Unit (SI Unit) through:

- TPA, Technology Promotion Association (Thailand-Japan).
- FLUKE, Fluke Corporation, U.S.A.
- THC, Thai Heart Calibration Co., Ltd.

**Measurement Results:**

Dimension of probe : Diameter 3 mm. Sensor Type : RTD (PT100)

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
75	20.003	20.00	0.003	0.0070
75	30.003	29.99	0.013	0.0070
75	40.003	39.98	0.023	0.0070

UUC : Unit Under Calibration

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

VERIFIED

- End of Certificate -

Calibrated by \_\_\_\_\_  
Apisit  
REV.02 02/24/21

FE-169

## CERTIFICATE OF CALIBRATION

Certificate No.: CO-0908008/21

Page 1 of total 2 pages

**Customer**  
SGS (THAILAND) LIMITED  
100 Nanglinchee Road, Chongnonsee,  
Yannawa, Bangkok 10120 Thailand

**Equipment**  
pH Meter  
**Manufacturer**  
HANNA  
**Model**  
HI98195  
**Serial No.**  
04260060101  
**ID No.**  
ENWA19103  
**Description**  
Range : 0 - 14 pH, Resolution : 0.01 pH

**Environmental Conditions**  
Ambient Temperature: (20 ± 2) °C  
Relative Humidity: (50 ± 10) %  
Atmospheric Pressure: -

**Calibration Location**  
Jayhawks Laboratory (CL&GL)  
**Received Date**  
9 August 2021  
**Calibration Date**  
10 August 2021

**Date of Issue**  
11 August 2021

**Checked by** [Signature]

**Approved by** [Signature]

Act as Technical Manager

Representative of Managing Director

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( Dr. Ekachai Puttiwong )

VERIFIED

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

Certificate No.: CO-0908008/21

Page 2 of total 2 pages

**Reference Method:**

- The calibration method used was CP-178 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard:**

Type	pH Value	Lot No.	Due Date	Traceability
pH Standard Solution	4.01	081020	Feb. 1, 2022	NIMT
	7.01	020221	Dec. 25, 2021	
	10.00	091020	Jan. 19, 2022	

Type	Model	Serial No.	Certificate No.	Due Date	Traceability
Digital Thermometer with Sensor	1523 / 5622	1709138 / 4605984-005	10-1006001/21	Jun. 10, 2022	THC

**Remark:** This certificate is traceable to the International System of Unit (SI Unit) through:

- NIMT, National Institute of Metrology (Thailand).
- THC, Thai Heart Calibration Co., Ltd.

**Measurement Results:**

Calibration of pH Electrode (Serial No.: L79078)

pH Standard Solution (pH)	Measured Value		Uncertainty (± pH)
	(pH)	(mV)	
4.01	4.04	166.6	0.013
7.01	7.03	-8.8	0.013
10.00	10.03	-177.6	0.013

Note : Adjust Curve to Buffer Solution pH (4.7,10)

Temperature stability of micro bath : 25 ± 0.2°C

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

VERIFIED

- End of Certificate -

Calibrated by Onnapa





SKC Certificate of Compliance  
Universal XR Sampler

This is to certify that the item listed below is in accordance with factory specifications. SKC test equipment is calibrated in accordance with ISO/IEC 17025 utilizing NIST and/or UKAS traceability standards.

Model Number 834-PXR4 Serial Number 853846

Settings		Acceptance Criteria	
Flow ml/min	BP Inches of water	Minimum ml/min	Maximum ml/min
5000	0	5000	5000
	10	4750	5250
4000	0	4000	4000
	20	3800	4200
3000	0	3000	3000
	35	2850	3150
2500	0	2500	2500
	40	2375	2625
2000	0	2000	2000
	20	1900	2100
	40	1900	2100
1000	0	1000	1000
	20	950	1050
	40	950	1050

Check Points	
Set Regulator 20"	✓
Keyboard Check	✓
Flow Fault	✓

Technician # ///

Quality Assurance Administrator



SKC Certificate of Compliance  
Universal XR Sampler

This is to certify that the item listed below is in accordance with factory specifications. SKC test equipment is calibrated in accordance with ISO/IEC 17025 utilizing NIST and/or UKAS traceability standards.

Model Number 834-PXR4 Serial Number 853838

Settings		Acceptance Criteria	
Flow ml/min	BP Inches of water	Minimum ml/min	Maximum ml/min
5000	0	5000	5000
	10	4750	5250
4000	0	4000	4000
	20	3800	4200
3000	0	3000	3000
	35	2850	3150
2500	0	2500	2500
	40	2375	2625
2000	0	2000	2000
	20	1900	2100
	40	1900	2100
1000	0	1000	1000
	20	950	1050
	40	950	1050

Check Points	
Set Regulator 20"	✓
Keyboard Check	✓
Flow Fault	✓

Technician # ///

Quality Assurance Administrator



# Certificate of Conformity and Calibration

**TUFF 3 Plus I.S. Personal Air Sampler**

98063026  
938 18

1598-99

#### Applicable standards:-

EN1252 - Workplace Atmospheres: Pump for Personal Sampling of Chemical Agents  
 MD515145 - General Methods for Sampling and Surveilance: Analysis of Respirable and Inhalable Dust  
 NORM-0003 - Particulates Not Otherwise Regulated: Respirable

### Test Conditions

Temperature	30	°C
Humidity	65	%RH
Pressure	997	mbBar

**Test Engineer:-** **Malika Dorian**

**Date of Issue:-** **November 16, 2016**

## Equipment Used

Air Flow Calibrator:	Serial Number:	000103-L
Type:	BCI Challenger	

**Declaration of conformity**

This test certificate certifies that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.

Tests are performed using equipment traceable to national standards, in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

#### Test and Calibration Results :-

## General tests

Item	Measured value	Lower Limit	Upper Limit	Status
Pump temperature (°C)	30	35	35	Pass
Battery voltage (V)	8.19	4.4	8.8	Pass
General hardware	N/A	N/A	N/A	Pass
Infrared communication	N/A	N/A	N/A	Pass

## Flow rate accuracy

Self-flow policy (times/day)	Measured flow rate (litres/day)	Error (%)	Error Limits (%)	Setting
1.50	1.48	-1.33%	-5%	Phase
2.20	2.21	0.45%	-5%	Phase
3.00	2.98	-0.67%	-5%	Phase

## Flow control accuracy

Set flow point (atmosphere)	Inlet pressure loading (cm H <sub>2</sub> O)	Measured flow rate (percentage)	Error (%)		Error Limits (%)		Status
			Rel.	Abs.	Min	Max	
2.25	10	2.21					Rel.
2.42	10						Rel.
2.42	40						Rel.

Flow control accuracy

**Cassella C&L**  
Regent House, Wicksteed Road,  
Warrington, Cheshire  
WA2 7JY  
United Kingdom

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Fax: +44 (0) 1294 941400  
E-mail: [info@cassellaclearwater.co.uk](mailto:info@cassellaclearwater.co.uk)  
Web: [www.cassellaclearwater.co.uk](http://www.cassellaclearwater.co.uk)



**GIIC** lab **GIIC Calibration Laboratory**

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Bangkok 10400 Thailand

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Fax : +86 (02) 615 1644

E-mail: [cal@calica.co.th](mailto:cal@calica.co.th)

CERTIFICATE No. CAL00045-22 PAGE 1 OF 3

# Certificate of Calibration

Equipment •

Manufacture -

TENMARS

Model / Type : TM-201L

Serial No. : 210101092

ENWP21205

Customer : SGS (Thailand) Limited.

100 Nandintree Road, Chongnonsae, Yannawa, Bangkok 10120.

C.S.R. No. : L0000035-22

Received Date : 10 January 2022

Calibration Date : 13 January 2022

Calibrated By :  
TONTRAKARN SRIKACHA

Approved By : NATTAPOL KINGKAEW

Issue Date : 13 January 2022

VERIFIED

The uncertainties are for a level of confidence of approximately 95%.

This is certified to be a true and correct copy of the original as submitted to the laboratory.

GLICLAB-FM-7.8-001 Rev 00 (20M1/20)

## CALIBRATION REPORT

### Condition of this calibration result :

1. Environment : Temperature : (23 ± 3) °C  
Relative Humidity : (50 ± 15) %

### 2. Reference / Procedure Used :

- This instrument was calibrated by substitution with reference illuminance meter, the instrument and reference illuminance meter were mounted with the plane of its diffuser vertical and normal to the direction of measurement
- Calibration was illuminated by the luminous standard lamp (operated at colour temperature 2856K) according to GIC Calibration Laboratory calibration procedure No.GICLAB-CP-L01.

### 3. Reference Standard Instrument :

Instrument	Model	Serial No	Certificate No	Due Dated
Illuminance meter	PHA2200 / PHA2130	25531 / 025000	TP-1010-21	27 May 22

### 4. This Certification is traceable to the SI unit through :

- The National Institute of Metrology (Thailand) .

### 5. Uncertainty :

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

## CALIBRATION REPORT

All data shown below were as received value : After adjustment

### Calibration result :

Function: Illuminance Measurement

U.U.C. Range (lux)	Standard Setting (lux)	U.U.C. Reading Before / After (lux)	Error (lux)	Uncertainty of measurement ± (lux)
2000	0	0 / 0	0	0.82
	50	48 / 49	-1	1.6
	250	245 / 249	-1	6.5
	500	491 / 500	0	13
	1000	983 / 1001	1	26
	1950	1918 / 1952	2	47
20000	2000	1960 / 2000	0	48
	3000	2950 / 3000	0	72
	4000	3930 / 4000	0	96
	5000	4910 / 4990	-10	0.12 klux

- U.U.C. = Unit Under Calibration

This result of calibration was found accurate as shown on data and place of calibration only.

- END -