

ภาคผนวก ง

ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

ภาคผนวก ง.1

ใบรับรองผลการตรวจวิเคราะห์คุณภาพอากาศในบรรยากาศ



Meteorological Monitoring Results : Wind Rose MTR-UNT&UUCP

Location : Wat Pluak Kate

Monitor period : 01-08 Jul 2022

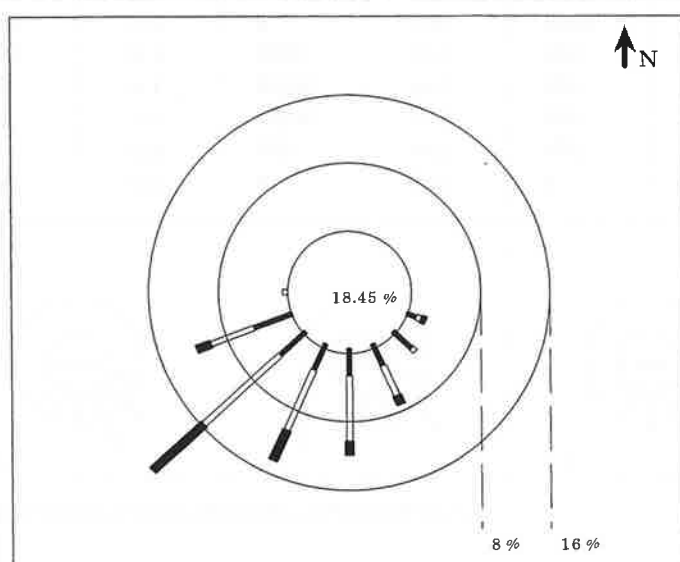
Wind Speed Model : NRG Symphonie

Serial No : 5086

Wind Direction Model : NRG Symphonie

Serial No : 5086

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0119	0.0060	0.0060	0.0000	0.0000	0.0000	0.0238
SE	0.0298	0.0060	0.0000	0.0000	0.0000	0.0000	0.0357
SSE	0.0298	0.0417	0.0119	0.0000	0.0000	0.0000	0.0833
S	0.0357	0.0833	0.0179	0.0000	0.0000	0.0000	0.1369
SSW	0.0357	0.0833	0.0417	0.0000	0.0000	0.0000	0.1607
SW	0.0417	0.1250	0.0833	0.0000	0.0000	0.0000	0.2500
WSW	0.0476	0.0536	0.0179	0.0000	0.0000	0.0000	0.1190
W	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.1845						



Application : WindPro Ver.1.0

Control : 16 Direction Calculation With
Calm Wind < 0.5 m/sData Unit : Direction in Deg.
Wind Speed in m/sNOTE : Frequencies indicate direction from which
the wind is blowing

File Control : R:\Database\Windrose\FileControl\Win-222032-Wat Pluak Kate 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-UNT&UUCP

Location : Wat Pluak Kate

Monitor period : 01-08 Jul 2022

Wind Speed Model : NRG Symphonie

Serial No : 5086

Wind Direction Model : NRG Symphonie

Serial No : 5086

Time	01-02 Jul 2022		02-03 Jul 2022		03-04 Jul 2022		04-05 Jul 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	2.1	SW	0.9	SW	2.3	SW	1.9	S
13:00 - 14:00	1.0	SSE	1.4	W	0.7	WSW	1.1	SSW
14:00 - 15:00	1.5	SSW	0.8	SSW	0.4	SSE	1.5	WSW
15:00 - 16:00	0.3	SW	2.2	SSW	1.8	S	2.0	WSW
16:00 - 17:00	2.3	SW	0.3	SSE	0.3	SW	1.0	S
17:00 - 18:00	0.7	SSE	2.3	S	2.1	SSW	1.0	SE
18:00 - 19:00	0.6	ESE	2.2	SW	0.4	SE	0.6	SSW
19:00 - 20:00	1.8	SSW	0.1	SW	1.7	SW	2.0	SW
20:00 - 21:00	2.1	ESE	1.0	S	2.2	SW	2.1	WSW
21:00 - 22:00	2.1	SSE	0.9	WSW	1.7	SW	2.1	SSW
22:00 - 23:00	1.0	SE	0.9	S	0.9	SW	1.4	SW
23:00 - 24:00	1.3	S	2.2	SSW	0.2	SSE	0.6	SSE
00:00 - 01:00	1.3	WSW	1.3	SSE	1.1	SSE	2.3	S
01:00 - 02:00	1.8	S	1.5	SSE	1.6	SW	0.3	WSW
02:00 - 03:00	0.7	WSW	1.0	SE	0.4	S	1.1	ESE
03:00 - 04:00	1.5	SW	0.4	S	0.5	SSW	2.1	SW
04:00 - 05:00	1.6	SSE	1.1	SSW	0.6	SSW	1.6	SW
05:00 - 06:00	0.6	SW	0.3	SSW	0.3	SE	1.0	SSW
06:00 - 07:00	1.3	S	1.6	SSW	2.1	S	2.0	SSW
07:00 - 08:00	1.5	SSW	1.1	SW	1.7	SSW	1.6	SSW
08:00 - 09:00	1.8	SW	2.3	SW	1.5	WSW	1.6	SSE
09:00 - 10:00	0.3	SW	2.0	SW	0.7	WSW	2.1	SSE
10:00 - 11:00	2.2	SSW	1.9	SW	1.8	SW	0.6	SE
11:00 - 12:00	0.4	WSW	1.9	S	0.7	S	2.0	SW
Wind Rose								



File Control :R:\Database\Windrose\FileControl\Win-222032-Wat Pluak Kate 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-UNT&UUCP

Location : Wat Pluak Kate

Monitor period : 01-08 Jul 2022

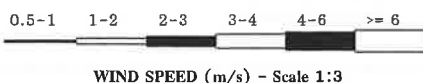
Wind Speed Model : NRG Symphonie

Serial No : 5086

Wind Direction Model : NRG Symphonie

Serial No : 5086

Time	05-06 Jul 2022		06-07 Jul 2022		07-08 Jul 2022		
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	
12:00 - 13:00	0.2	SW	1.2	WSW	1.2	SSW	
13:00 - 14:00	0.6	S	1.7	WSW	1.8	SW	
14:00 - 15:00	0.4	SE	2.2	SW	2.1	SW	
15:00 - 16:00	0.4	SW	1.3	SSE	1.4	SW	
16:00 - 17:00	2.2	SW	0.3	SSW	0.1	SE	
17:00 - 18:00	0.8	SW	0.7	SSW	2.1	SW	
18:00 - 19:00	0.6	SSW	1.6	SW	0.4	SSE	
19:00 - 20:00	0.8	WSW	0.2	SW	0.6	WSW	
20:00 - 21:00	1.9	SW	1.9	SSE	0.3	SE	
21:00 - 22:00	2.0	S	1.8	SW	1.7	S	
22:00 - 23:00	2.3	SSW	0.6	SW	1.2	SSW	
23:00 - 24:00	2.1	SSW	2.0	SW	2.0	WSW	
00:00 - 01:00	0.6	SW	0.5	SSE	1.0	WSW	
01:00 - 02:00	1.2	S	0.7	S	1.3	SE	
02:00 - 03:00	1.4	SSW	0.7	SSE	1.8	WSW	
03:00 - 04:00	1.0	SW	1.9	WSW	1.2	SSW	
04:00 - 05:00	0.2	ESE	1.7	S	0.6	SE	
05:00 - 06:00	1.8	WSW	0.3	SSW	0.2	SSW	
06:00 - 07:00	1.9	SW	0.2	SW	0.7	WSW	
07:00 - 08:00	0.5	ESE	1.9	SW	2.0	SW	
08:00 - 09:00	0.6	SW	0.5	SSE	1.3	WSW	
09:00 - 10:00	0.5	SSE	0.5	WSW	1.0	S	
10:00 - 11:00	0.4	S	1.4	S	1.0	S	
11:00 - 12:00	0.4	WSW	1.2	S	1.2	SW	
Wind Rose							



File Control :R:\Database\Windrose\FileControl\Win-222032-Wat Pluak Kate 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-UNT&UUCP

Location : Ban Na Pun R.7

Monitor period : 01-08 Jul 2022

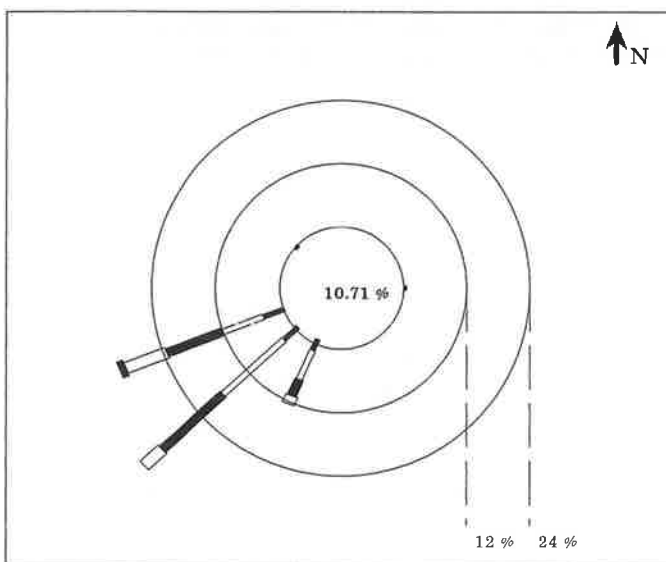
Wind Speed Model : NRG Symphonie

Serial No : 1632

Wind Direction Model : NRG Symphonie

Serial No : 1632

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSW	0.0238	0.0655	0.0357	0.0179	0.0000	0.0000	0.1429
SW	0.0357	0.1607	0.1607	0.0476	0.0000	0.0000	0.4048
WSW	0.0417	0.0833	0.1131	0.0833	0.0119	0.0000	0.3333
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.1071						



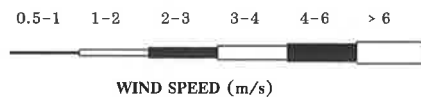
Application : WindPro Ver.1.0

Control : 16 Direction Calculation With

Calm Wind < 0.5 m/s

Data Unit : Direction in Deg.

Wind Speed in m/s



NOTE : Frequencies indicate direction from which the wind is blowing

File Control : R:\Database\Windrose\FileControl\Win-222032-Ban Na Pun R.7 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-UNT&UUCP

Location : Ban Na Pun R.7

Monitor period : 01-08 Jul 2022

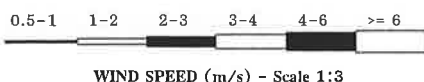
Wind Speed Model : NRG Symphonie

Serial No : 1632

Wind Direction Model : NRG Symphonie

Serial No : 1632

Time	01-02 Jul 2022		02-03 Jul 2022		03-04 Jul 2022		04-05 Jul 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.1	SSW	2.9	SW	3.8	WSW	2.3	SW
12:00 - 13:00	1.1	SW	3.1	SW	3.7	WSW	1.9	SW
13:00 - 14:00	1.3	SW	3.4	SW	3.9	WSW	1.4	SW
14:00 - 15:00	2.2	SW	3.5	SW	3.7	WSW	2.3	SW
15:00 - 16:00	2.4	SW	3.1	WSW	2.9	WSW	1.8	SW
16:00 - 17:00	1.3	SW	2.2	SW	2.9	SW	3.1	SW
17:00 - 18:00	1.9	SW	1.9	WSW	2.3	WSW	1.7	SSW
18:00 - 19:00	4.2	WSW	1.8	WSW	2.9	WSW	3.1	SSW
19:00 - 20:00	3.3	WSW	2.2	SW	2.4	SW	2.8	SSW
20:00 - 21:00	1.8	WSW	2.9	SW	2.9	WSW	1.5	SSW
21:00 - 22:00	0.8	WSW	3.1	SW	2.3	WSW	2.7	SSW
22:00 - 23:00	0.8	WSW	3.2	SW	2.5	WSW	3.4	SSW
23:00 - 24:00	0.9	WSW	3.1	WSW	1.9	SW	3.4	SW
00:00 - 01:00	1.4	WSW	3.6	WSW	1.8	SW	2.8	SW
01:00 - 02:00	2.7	WSW	3.1	WSW	3.2	SW	2.3	SW
02:00 - 03:00	3.1	WSW	4.1	WSW	1.9	SW	2.7	SSW
03:00 - 04:00	3.2	WSW	3.8	WSW	2.2	SW	1.7	SSW
04:00 - 05:00	3.1	WSW	2.7	WSW	1.6	SW	2.1	SW
05:00 - 06:00	2.2	WSW	2.6	SW	0.9	SW	2.1	SSW
06:00 - 07:00	2.5	SW	1.7	WSW	1.0	SW	1.4	SSW
07:00 - 08:00	2.6	WSW	1.6	WSW	1.2	SW	1.9	SSW
08:00 - 09:00	3.0	WSW	2.4	WSW	1.9	SW	2.0	SW
09:00 - 10:00	2.7	WSW	2.8	WSW	2.2	SW	3.3	SSW
10:00 - 11:00	2.6	WSW	3.2	WSW	2.6	WSW	2.9	SSW
Wind Rose								



File Control : R:\Database\Windrose\FileControl\Win-222032-Ban Na Pun R.7 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-UNT&UUCP

Location : Ban Na Pun R.7

Monitor period : 01-08 Jul 2022

Wind Speed Model : NRG Symphonie

Serial No : 1632

Wind Direction Model : NRG Symphonie

Serial No : 1632

Time	05-06 Jul 2022		06-07 Jul 2022		07-08 Jul 2022		
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	
11:00 - 12:00	2.9	SSW	1.8	WSW	0.9	SW	
12:00 - 13:00	2.2	SW	2.6	SW	1.9	SW	
13:00 - 14:00	2.2	SW	3.0	SW	2.5	WSW	
14:00 - 15:00	1.2	SSW	2.5	SW	2.2	WSW	
15:00 - 16:00	1.5	SW	2.4	SW	2.6	SW	
16:00 - 17:00	1.9	SSW	1.1	SW	2.8	SW	
17:00 - 18:00	1.6	SSW	1.1	SSW	1.7	SW	
18:00 - 19:00	1.3	SSW	0.3	SSW	1.9	SW	
19:00 - 20:00	1.6	SW	0.2	SSW	1.8	WSW	
20:00 - 21:00	1.8	SW	0.1	SSW	1.0	WSW	
21:00 - 22:00	1.9	SW	0.6	SSW	0.9	SW	
22:00 - 23:00	0.6	WSW	0.5	SSW	0.4	NW	
23:00 - 24:00	0.0	ENE	0.9	SSW	0.5	WSW	
00:00 - 01:00	0.4	E	0.9	SSW	1.5	WSW	
01:00 - 02:00	0.0	E	0.5	SSW	1.5	WSW	
02:00 - 03:00	0.1	N	0.8	NW	2.0	WSW	
03:00 - 04:00	0.4	E	0.4	WSW	1.9	WSW	
04:00 - 05:00	0.6	E	2.5	WSW	1.1	SW	
05:00 - 06:00	0.3	NE	1.6	WSW	0.3	WSW	
06:00 - 07:00	0.3	NNE	1.3	WSW	0.3	W	
07:00 - 08:00	0.0	ESE	1.1	SW	0.2	SSW	
08:00 - 09:00	0.3	ESE	2.2	SW	0.9	SW	
09:00 - 10:00	0.9	WSW	2.1	SW	1.8	SW	
10:00 - 11:00	1.9	SW	1.2	SW	0.9	SW	
Wind Rose							



File Control :R:\Database\Windrose\FileControl\Win-222032-Ban Na Pun R.7 01-08 Jul 2022

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Preeda Somjai)
 Technical Management Team



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. **REF. NO.** : 222032 Amb-TSP (Jul 22)

SAMPLING BY : SECOT Co., Ltd. **SAMPLING DATE** : 01-08/07/2022

RECEIVED DATE : 11/07/2022 **ANALYTICAL DATE** : 11-12/07/2022

REPORT DATE : 16/07/2022 **SAMPLE CONDITION** : Normal

SITE OPERATOR : Mr. Sittichai Sawangwongchai

STATION DESCRIPTION : 1. Wat Pluak Kate
2. Ban Na Pun R.7

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
TSP (24 hr)	01-02/07/2022	mg/m ³	0.036	0.015	0.330	High Volume Air
	02-03/07/2022	mg/m ³	0.027	0.012		Sampler/Gravimetric
	03-04/07/2022	mg/m ³	0.022	0.010		Method
	04-05/07/2022	mg/m ³	0.028	0.010		
	05-06/07/2022	mg/m ³	0.028	0.019		
	06-07/07/2022	mg/m ³	0.024	0.016		
	07-08/07/2022	mg/m ³	0.026	0.012		

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpet

(Miss Narisa Poowasanpet)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. * Notification of the National Environment Board, No.24, B.E.2547.



Ambient Air Monitoring Results : Sulfur dioxide MTR-UNT&UUCP

Location : Wat Pluak Kate

Monitor Period : 01-08 Jul 2022

Analyzer Model : Teledyne T100

Station No : Shelter 16

Serial No : 2009

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D. : EB0108319

Certified Date : 13 Jan 2022

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 12 Jan 2023

Time	SO2 Concentration (ppm)						
	01-02 Jul 2022	02-03 Jul 2022	03-04 Jul 2022	04-05 Jul 2022	05-06 Jul 2022	06-07 Jul 2022	07-08 Jul 2022
12:00 - 13:00	0.0044	0.0052	0.0042	0.0058	0.0058	0.0048	0.0034
13:00 - 14:00	0.0035	0.0036	0.0059	0.0052	0.0034	0.0034	0.0038
14:00 - 15:00	0.0052	0.0037	0.0062	0.0044	0.0047	0.0049	0.0048
15:00 - 16:00	0.0043	0.0032	0.0038	0.0046	0.0048	0.0053	0.0050
16:00 - 17:00	0.0056	0.0041	0.0055	0.0056	0.0060	0.0044	0.0045
17:00 - 18:00	0.0036	0.0047	0.0034	0.0059	0.0059	0.0039	0.0053
18:00 - 19:00	0.0033	0.0036	0.0048	0.0032	0.0060	0.0046	0.0044
19:00 - 20:00	0.0047	0.0042	0.0047	0.0047	0.0043	0.0036	0.0060
20:00 - 21:00	0.0039	0.0031	0.0058	0.0060	0.0032	0.0057	0.0051
21:00 - 22:00	0.0039	0.0032	0.0053	0.0052	0.0035	0.0056	0.0038
22:00 - 23:00	0.0035	0.0057	0.0050	0.0036	0.0052	0.0059	0.0036
23:00 - 00:00	0.0034	0.0050	0.0031	0.0045	0.0039	0.0036	0.0034
00:00 - 01:00	0.0057	0.0046	0.0055	0.0038	0.0058	0.0042	0.0047
01:00 - 02:00	0.0056	0.0042	0.0045	0.0034	0.0055	0.0041	0.0057
02:00 - 03:00	0.0059	0.0059	0.0045	0.0043	0.0054	0.0062	0.0060
03:00 - 04:00	0.0057	0.0035	0.0062	0.0036	0.0051	0.0038	0.0049
04:00 - 05:00	0.0047	0.0040	0.0053	0.0032	0.0042	0.0034	0.0038
05:00 - 06:00	0.0034	0.0031	0.0034	0.0055	0.0055	0.0032	0.0050
06:00 - 07:00	0.0031	0.0062	0.0035	0.0035	0.0052	0.0032	0.0032
07:00 - 08:00	0.0060	0.0059	0.0048	0.0061	0.0043	0.0054	0.0059
08:00 - 09:00	0.0052	0.0049	0.0052	0.0031	0.0037	0.0045	0.0050
09:00 - 10:00	0.0034	0.0033	0.0035	0.0049	0.0052	0.0050	0.0046
10:00 - 11:00	0.0042	0.0045	0.0048	0.0033	0.0053	0.0041	0.0047
11:00 - 12:00	0.0051	0.0044	0.0046	0.0054	0.0041	0.0054	0.0047
Average-24Hr*	0.0045	0.0043	0.0047	0.0045	0.0048	0.0045	0.0046
Max-1Hr	0.0060	0.0062	0.0062	0.0061	0.0060	0.0062	0.0060
Min-1Hr	0.0031	0.0031	0.0031	0.0031	0.0032	0.0032	0.0032
Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

Remark : * Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-UNT&UUCP

Location : Ban Na Pun R.7	Monitor Period : 01-08 Jul 2022
Analyzer Model : API 100A	Station No : Shelter 15
Serial No : 053	Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : Teledyne 700E	Serial No : 587
Calibration Gas Cylinder I.D.: EB0108319	
Certified Date : 13 Jan 2022	Cal Concentration (ppb) : 0,100,200,400
Expire Date : 12 Jan 2023	

Time	SO2 Concentration (ppm)						
	01-02 Jul 2022	02-03 Jul 2022	03-04 Jul 2022	04-05 Jul 2022	05-06 Jul 2022	06-07 Jul 2022	07-08 Jul 2022
11:00 - 12:00	0.0022	0.0037	0.0019	0.0037	0.0030	0.0029	0.0026
12:00 - 13:00	0.0030	0.0020	0.0031	0.0034	0.0026	0.0028	0.0018
13:00 - 14:00	0.0025	0.0031	0.0029	0.0034	0.0037	0.0023	0.0019
14:00 - 15:00	0.0024	0.0029	0.0026	0.0022	0.0029	0.0023	0.0030
15:00 - 16:00	0.0019	0.0020	0.0021	0.0023	0.0037	0.0022	0.0033
16:00 - 17:00	0.0032	0.0018	0.0029	0.0036	0.0036	0.0034	0.0035
17:00 - 18:00	0.0025	0.0037	0.0018	0.0030	0.0028	0.0027	0.0024
18:00 - 19:00	0.0030	0.0028	0.0035	0.0023	0.0029	0.0030	0.0028
19:00 - 20:00	0.0032	0.0032	0.0021	0.0034	0.0029	0.0025	0.0026
20:00 - 21:00	0.0020	0.0031	0.0024	0.0023	0.0029	0.0033	0.0036
21:00 - 22:00	0.0026	0.0036	0.0017	0.0028	0.0020	0.0028	0.0023
22:00 - 23:00	0.0033	0.0030	0.0029	0.0031	0.0017	0.0022	0.0026
23:00 - 00:00	0.0033	0.0019	0.0019	0.0037	0.0018	0.0025	0.0029
00:00 - 01:00	0.0037	0.0017	0.0027	0.0029	0.0021	0.0024	0.0022
01:00 - 02:00	0.0023	0.0033	0.0037	0.0035	0.0026	0.0029	0.0037
02:00 - 03:00	0.0027	0.0017	0.0032	0.0036	0.0017	0.0021	0.0024
03:00 - 04:00	0.0029	0.0017	0.0027	0.0025	0.0032	0.0035	0.0027
04:00 - 05:00	0.0026	0.0037	0.0024	0.0031	0.0017	0.0029	0.0036
05:00 - 06:00	0.0026	0.0020	0.0017	0.0032	0.0023	0.0021	0.0020
06:00 - 07:00	0.0021	0.0031	0.0025	0.0025	0.0018	0.0026	0.0018
07:00 - 08:00	0.0023	0.0028	0.0017	0.0026	0.0033	0.0030	0.0028
08:00 - 09:00	0.0026	0.0036	0.0029	0.0019	0.0027	0.0036	0.0035
09:00 - 10:00	0.0029	0.0021	0.0031	0.0027	0.0034	0.0019	0.0027
10:00 - 11:00	0.0037	0.0018	0.0022	0.0020	0.0027	0.0022	0.0030
Average-24Hr*	0.0027	0.0027	0.0025	0.0029	0.0027	0.0027	0.0027
Max-1Hr	0.0037	0.0037	0.0037	0.0037	0.0037	0.0036	0.0037
Min-1Hr	0.0019	0.0017	0.0017	0.0019	0.0017	0.0019	0.0018
Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

Remark : * Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Nitrogen dioxide MTR-UNT&UUCP

Location : Wat Pluak Kate

Monitor Period : 01-08 Jul 2022

Analyzer Model : Teledyne T200

Station No : Shelter 16

Serial No : 110

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D. : EB0108319

Certified Date : 13 Jan 2022

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 12 Jan 2023

Time	NO2 Concentration (ppm)						
	01-02 Jul 2022	02-03 Jul 2022	03-04 Jul 2022	04-05 Jul 2022	05-06 Jul 2022	06-07 Jul 2022	07-08 Jul 2022
12:00 - 13:00	0.0188	0.0084	0.0131	0.0163	0.0165	0.0251	0.0152
13:00 - 14:00	0.0129	0.0076	0.0261	0.0255	0.0087	0.0128	0.0231
14:00 - 15:00	0.0081	0.0135	0.0261	0.0248	0.0221	0.0167	0.0247
15:00 - 16:00	0.0207	0.0111	0.0096	0.0215	0.0099	0.0173	0.0077
16:00 - 17:00	0.0147	0.0230	0.0183	0.0238	0.0159	0.0198	0.0137
17:00 - 18:00	0.0216	0.0141	0.0206	0.0221	0.0213	0.0119	0.0123
18:00 - 19:00	0.0117	0.0234	0.0198	0.0232	0.0219	0.0189	0.0159
19:00 - 20:00	0.0149	0.0120	0.0196	0.0198	0.0135	0.0201	0.0185
20:00 - 21:00	0.0143	0.0227	0.0177	0.0222	0.0213	0.0234	0.0234
21:00 - 22:00	0.0233	0.0252	0.0122	0.0111	0.0159	0.0202	0.0251
22:00 - 23:00	0.0240	0.0161	0.0120	0.0109	0.0200	0.0218	0.0143
23:00 - 00:00	0.0208	0.0169	0.0194	0.0243	0.0255	0.0127	0.0180
00:00 - 01:00	0.0192	0.0154	0.0089	0.0133	0.0129	0.0165	0.0171
01:00 - 02:00	0.0182	0.0229	0.0229	0.0095	0.0248	0.0170	0.0127
02:00 - 03:00	0.0247	0.0239	0.0130	0.0136	0.0163	0.0098	0.0126
03:00 - 04:00	0.0128	0.0136	0.0115	0.0083	0.0199	0.0260	0.0098
04:00 - 05:00	0.0229	0.0150	0.0203	0.0159	0.0128	0.0120	0.0225
05:00 - 06:00	0.0120	0.0173	0.0120	0.0129	0.0193	0.0167	0.0135
06:00 - 07:00	0.0161	0.0089	0.0122	0.0100	0.0205	0.0173	0.0172
07:00 - 08:00	0.0221	0.0137	0.0152	0.0192	0.0222	0.0156	0.0129
08:00 - 09:00	0.0105	0.0100	0.0218	0.0203	0.0203	0.0110	0.0195
09:00 - 10:00	0.0146	0.0151	0.0126	0.0169	0.0242	0.0217	0.0171
10:00 - 11:00	0.0128	0.0084	0.0093	0.0245	0.0120	0.0176	0.0160
11:00 - 12:00	0.0173	0.0244	0.0115	0.0117	0.0216	0.0089	0.0166
Average-24Hr*	0.0170	0.0159	0.0161	0.0176	0.0183	0.0171	0.0166
Max-1Hr	0.0247	0.0252	0.0261	0.0255	0.0255	0.0260	0.0251
Min-1Hr	0.0081	0.0076	0.0089	0.0083	0.0087	0.0089	0.0077
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Preeda Somjai)
 Technical Management Team



Ambient Air Monitoring Results : Nitrogen dioxide MTR-UNT&UUCP

Location : Ban Na Pun R.7

Monitor Period : 01-08 Jul 2022

Analyzer Model : Teledyne T200

Station No : Shelter 15

Serial No : 120

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D. : EB0108319

Certified Date : 13 Jan 2022

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 12 Jan 2023

Time	NO2 Concentration (ppm)						
	01-02 Jul 2022	02-03 Jul 2022	03-04 Jul 2022	04-05 Jul 2022	05-06 Jul 2022	06-07 Jul 2022	07-08 Jul 2022
11:00 - 12:00	0.0081	0.0187	0.0157	0.0130	0.0154	0.0073	0.0079
12:00 - 13:00	0.0110	0.0078	0.0082	0.0085	0.0176	0.0115	0.0151
13:00 - 14:00	0.0139	0.0087	0.0114	0.0131	0.0059	0.0118	0.0117
14:00 - 15:00	0.0142	0.0147	0.0061	0.0177	0.0140	0.0070	0.0122
15:00 - 16:00	0.0134	0.0148	0.0164	0.0102	0.0095	0.0174	0.0069
16:00 - 17:00	0.0166	0.0078	0.0130	0.0149	0.0171	0.0179	0.0099
17:00 - 18:00	0.0165	0.0117	0.0179	0.0080	0.0081	0.0181	0.0126
18:00 - 19:00	0.0178	0.0110	0.0129	0.0179	0.0110	0.0144	0.0079
19:00 - 20:00	0.0072	0.0162	0.0175	0.0101	0.0167	0.0072	0.0105
20:00 - 21:00	0.0152	0.0156	0.0161	0.0142	0.0115	0.0189	0.0076
21:00 - 22:00	0.0147	0.0108	0.0192	0.0167	0.0091	0.0156	0.0124
22:00 - 23:00	0.0169	0.0113	0.0181	0.0157	0.0084	0.0108	0.0055
23:00 - 00:00	0.0078	0.0151	0.0124	0.0155	0.0118	0.0110	0.0101
00:00 - 01:00	0.0189	0.0108	0.0076	0.0070	0.0186	0.0166	0.0135
01:00 - 02:00	0.0096	0.0070	0.0088	0.0162	0.0144	0.0166	0.0078
02:00 - 03:00	0.0079	0.0099	0.0120	0.0181	0.0073	0.0124	0.0099
03:00 - 04:00	0.0107	0.0067	0.0105	0.0090	0.0088	0.0169	0.0082
04:00 - 05:00	0.0110	0.0102	0.0071	0.0119	0.0086	0.0149	0.0086
05:00 - 06:00	0.0115	0.0118	0.0129	0.0107	0.0162	0.0181	0.0079
06:00 - 07:00	0.0107	0.0142	0.0139	0.0172	0.0150	0.0102	0.0118
07:00 - 08:00	0.0163	0.0146	0.0102	0.0152	0.0138	0.0106	0.0175
08:00 - 09:00	0.0085	0.0129	0.0160	0.0069	0.0119	0.0099	0.0150
09:00 - 10:00	0.0168	0.0162	0.0086	0.0153	0.0114	0.0123	0.0084
10:00 - 11:00	0.0154	0.0078	0.0079	0.0124	0.0173	0.0115	0.0136
Average-24Hr*	0.0129	0.0119	0.0125	0.0131	0.0125	0.0133	0.0105
Max-1Hr	0.0189	0.0187	0.0192	0.0181	0.0186	0.0189	0.0175
Min-1Hr	0.0072	0.0067	0.0061	0.0069	0.0059	0.0070	0.0055
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Preeda Somjai)
 Technical Management Team

ภาคผนวก ง.2

ใบรับรองผลการตรวจวิเคราะห์ คุณภาพอากาศจากปล่องระบายอากาศ



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REF. NO. : 222032 Cert-Stk/Outlet_PM (Jul)
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/07/2022
RECEIVED DATE : 05/07/2022 ANALYTICAL DATE : 05-06/07/2022
REPORT DATE : 14/07/2022 SAMPLE CONDITION : Normal
STACK LOCATION : Outlet Diehead Absorber OPERATOR : Mr. Rattanachai Chobthamkij
SOURCE DESCRIPTION : Process FUEL TYPE : -

STACK DESCRIPTION

Height : 23.0 m Gas Velocity : 17.9 m/s
Diameter : 0.2 m Flow Rate* : 31.5 Ncu.m/min
Temperature : 33.0 °C Excess Oxygen : 20.8 %

PARAMETER	UNITS	RESULTS*	STANDARD	REFERENCE METHOD
Particulate Matter	mg/m ³	1.1	400 ^{1/} /54 ^{2/}	US.EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.จ-239-จ-8183

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ค-6419

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 (2006) and the Ministry of Natural Resources and Environment, B.E.2549 (2006) @ actual O₂.

5. ^{2/} Emission standard @ actual O₂ according to EIA report.



บริษัท ซีคอต จำกัด
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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REF. NO.	: 222032 Cert-Stk/Outlet_Lactam (Jul)
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 04/07/2022
RECEIVED DATE	: 05/07/2022	ANALYTICAL DATE	: 12/07/2022
REPORT DATE	: 15/07/2022	SAMPLE CONDITION	: Normal
STACK LOCATION	: Outlet Diehead Absorber	OPERATOR	: Mr. Rattanachai Chobthamkij
SOURCE DESCRIPTION	: Process	FUEL TYPE	: -

STACK DESCRIPTION

Height	: 23.0	m	Gas Velocity	: 17.9	m/s
Diameter	: 0.2	m	Flow Rate*	: 31.5	Ncu.m/min
Temperature	: 33.0	°C	Excess Oxygen	: 20.8	%

PARAMETER	UNITS	RESULTS*	STANDARD	REFERENCE METHOD
ไอ Caprolactam	mg/m ³	ND	-	HPLC

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ND (Non-detectable) means the concentration less than 0.90 mg/m³.



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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REF. NO. : 222032 Cert-Stk/Hot Oil_NO_x (Jul)
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04/07/2022
RECEIVED DATE : 05/07/2022 ANALYTICAL DATE : 07/07/2022
REPORT DATE : 15/07/2022 SAMPLE CONDITION : Normal
STACK LOCATION : Hot Oil Heater OPERATOR : Mr. Rattanachai Chobthamkij
SOURCE DESCRIPTION : Combustion FUEL TYPE : Natural Gas

STACK DESCRIPTION

Height : 20.0 m Gas Velocity : 4.3 m/s
Diameter : 0.45 m Flow Rate* : 21.4 Ncu.m/min
Temperature : 235.5 °C Excess Oxygen : 4.6 %

PARAMETER	UNITS	RESULTS*		STANDARD	REFERENCE METHOD
		4.6%O ₂	7%O ₂		
Oxide of Nitrogen	ppm	40.1	34.2	200 ^{1/} /95 ^{2/}	US.EPA Method 7

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.จ-239-จ-8183

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-6419

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 (2006) and the Ministry of Natural Resources and Environment, B.E.2549 (2006) @ 7%O₂.

5. ^{2/} Emission standard @ 7%O₂ according to EIA report.

ภาคผนวก ง.3

ใบรับรองผลการตรวจวิเคราะห์คุณภาพน้ำ



Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2271756

Date Received : Jul 06, 2022
Date Reported : Jul 15, 2022
Report Number : 2340191-1

Page 1 of 1

Sample Number 2271756-1
Sampled Date Jul 06, 2022 11:17 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Jul 07, 2022
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	404	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	881	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.9	Based on APHA (2017), 4500-H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	250	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	37.4	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	19	APHA (2017), 2540 D	Rayong

Sampled By : Tanasit Wongsachai, Panupong Manit

Remark :

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

Technical Management

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2271756

Date Received : Jul 06, 2022
Date Reported : Jul 15, 2022
Report Number : 2340191-2

Page 1 of 1

Sample Number 2271756-1
Sampled Date Jul 06, 2022 11:17 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Jul 06, 2022
Condition of Sample Contained in one amber glass bottle, two glass vials and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/hr	-	-	20.4	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	302	Based on APHA (2017), 5310 B	Bangkok

Sampled By : Tanasit Wongsachai, Panupong Manit

Remark :

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

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

N. Banchongkit

Narumon Banchongkit
Supervisor

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Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2284659

Date Received : Aug 03, 2022
Date Reported : Aug 11, 2022
Report Number : 2369831-1

Page 1 of 1

Sample Number 2284659-1
Sampled Date Aug 03, 2022 10:35 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Aug 04, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	264	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	813	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	9	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.5	Based on APHA (2017), 4500-H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	160	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	46.0	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	22	APHA (2017), 2540 D	Rayong

Sampled By : Narunat thammassaro , Jakkarin Manwicha

Remark :

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

N. Banchongkit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ๖-323-ค-9442

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2284659

Date Received : Aug 03, 2022
Date Reported : Aug 11, 2022
Report Number : 2369831-2

Page 1 of 1

Sample Number 2284659-1
Sampled Date Aug 03, 2022 10:35 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Aug 03, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/day	-	-	210	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	258	Based on APHA (2017), 5310 B	Bangkok

Sampled By : Narunat thammassaro , Jakkarin Manwicha

Remark :

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Approved by

N. Banchongkit

Narumon Banchongkit
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Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2296900

Date Received : Sep 20, 2022

Date Reported : Oct 14, 2022

Report Number : 2447857-1 Rev. No.1

Page 1 of 1

Sample Number	2296900-1
Sampled Date	Sep 20, 2022 11:38 AM
Sample Description	Wastewater
Location	S-32-111
Date Analysis Commenced	Sep 21, 2022
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	245	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	519	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.6	Based on APHA (2017), 4500-H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	186	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	32.1	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	17	APHA (2017), 2540 D	Rayong

Note : This Analysis test report is reissued to supersede report No.2447857-1, Date Reported : Sep 28, 2022 due to revise sample information.

Sampled By : Tanasit Wongsachai, Panupong Manit

Remark :

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Technical Management

N. Banphit

Narumon Banchongkit
Supervisor

ทะเบียนเลขที่ 1-323-จ-9445

Approved by

D. Changchon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ 1-323-ค-9442

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2296900

Date Received : Sep 20, 2022

Date Reported : Oct 14, 2022

Report Number : 2447857-2 Rev. No.1

Page 1 of 1

Sample Number 2296900-1
Sampled Date Sep 20, 2022 11:38 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Sep 20, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles; sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/day	-	-	250	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	184	Based on APHA (2017), 5310 B	Bangkok

Note : This Analysis test report is reissued to supersede report No.2447857-2, Date Reported : Sep 28, 2022 due to revise sample information.

Sampled By : Tanasit Wongsachai , Panupong Manit

Remark :

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Approved by

Narin Saiseng
Supervisor

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Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22112758
Date Received : Oct 05, 2022
Date Reported : Oct 14, 2022
Report Number : 2431520-1

Page 1 of 1

Sample Number 22112758-1
Sampled Date Oct 05, 2022 11:15 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Oct 06, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	332	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	848	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	9	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	Based on APHA (2017), 4500-H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	220	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	52.7	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	30	APHA (2017), 2540 D	Rayong

Sampled By : Tanasit Wongsachai, Panupong Manit

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Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ๖-323-๖-9442

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22112758
Date Received : Oct 05, 2022
Date Reported : Oct 14, 2022
Report Number : 2431520-2

Page 1 of 1

Sample Number	22112758-1					
Sampled Date	Oct 05, 2022 11:15 AM					
Sample Description	Wastewater					
Location	S-32-111					
Date Analysis Commenced	Oct 05, 2022					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/day	-	-	232	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	286	Based on APHA (2017), 5310 B	Bangkok

Sampled By : Tanasit Wongsachal, Panupong Manit

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Approved by

N. Banongkit

Narumon Banchongkit
Supervisor

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Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22121745
Date Received : Nov 03, 2022
Date Reported : Nov 11, 2022
Report Number : 2452441-1

Page 1 of 1

Sample Number 22121745-1
Sampled Date Nov 03, 2022 10:45 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Nov 04, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	266	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	755	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	19	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	Based on APHA (2017), 4500-H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	302	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	76.0	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	184	APHA (2017), 2540 D	Rayong

Sampled By : Tanasit Wongsachai, Thanasoun Namakunna

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Technical Management

N. Banphit

Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Chumon

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

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22121745

Date Received : Nov 03, 2022

Date Reported : Nov 11, 2022

Report Number : 2452441-2

Page 1 of 1

Sample Number 22121745-1
Sampled Date Nov 03, 2022 10:45 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Nov 03, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/day	-	-	133.44	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	164	Based on APHA (2017), 5310 B	Bangkok

Sampled By : Tanasit Wongsachai, Thanasoun Namakunna

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N. Banchongkit

Narumon Banchongkit
Supervisor

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Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22136956
Date Received : Dec 07, 2022
Date Reported : Dec 15, 2022
Report Number : 2521285-1

Page 1 of 1

Sample Number 22136956-1
Sampled Date Dec 07, 2022 11:25 AM
Sample Description Wastewater
Location S-32-111
Date Analysis Commenced Dec 08, 2022
Condition of Sample Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
BOD (5 days at 20 Degree C)	mg/L	-	2	116	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	5	603	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	210	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	47.6	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	18	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460 , Thanasoun Namakunna ทะเบียนเลขที่ ว-204-จ-8592

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Technical Management

N. Banchongkit

Narumon Banchongkit

Supervisor

ทะเบียนเลขที่ ว-323-จ-9445

Approved by

D. Changchon

Dej Changchon

Senior Manager

ทะเบียนเลขที่ ว-323-ค-9442

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 22136956

Date Received : Dec 07, 2022

Date Reported : Dec 15, 2022

Report Number : 2521285-2

Page 1 of 1

Sample Number	22136956-1					
Sampled Date	Dec 07, 2022 11:25 AM					
Sample Description	Wastewater					
Location	S-32-111					
Date Analysis Commenced	Dec 07, 2022					
Condition of Sample	Contained in two glass vials, one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Flow rate	m3/hr	-	-	19	Flow meter	Rayong
Total Organic Carbon	mg/L	0.01	0.1	180	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5310 B	Bangkok

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460 , Thanasoun Namakunna ทะเบียนเลขที่ ว-204-จ-8592

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Approved by

Siriluk P.

Siriluk Puengpang
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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500137400
Project Name : Environmental Monitoring
Project Location : Nylon Plant

Lot ID: 2296900

Date Received : Sep 20, 2022

Date Reported : Oct 14, 2022

Report Number : 2447858-1 Rev. No.1

Page 1 of 1

Sample Number	2296900-2					
Sampled Date	Sep 20, 2022 11:33 AM					
Sample Description	Cooling Water					
Location	หนองผือ					
Date Analysis Commenced	Sep 20, 2022					
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Oil & Grease	mg/L	-	3	<3	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	Based on APHA (2017), 4500-H (B)	Rayong
Temperature	Degree C	-	-	29.8	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	210	APHA (2017), 2540 C	Rayong

Note : This Analysis test report is reissued to supersede report No.2447858-1, Date Reported : Sep 28, 2022 due to revise sample information.

Sampled By : Tanasit Wongsachai , Panupong Manit

Remark :

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N. Banchongkit

Narumon Banchongkit
Supervisor

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000

P/O : 4500137400

Project Name : Environmental Monitoring

Project Location : Nylon Plant

Lot ID: 22136956

Date Received : Dec 07, 2022

Date Reported : Dec 15, 2022

Report Number : 2521286-1

Page 1 of 1

Sample Number 22136956-2
Sampled Date Dec 07, 2022 11:40 AM
Sample Description Cooling Water
Location ทนอลเอ็น
Date Analysis Commenced Dec 07, 2022
Condition of Sample Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
Water Testing						
Oil & Grease	mg/L	-	3	<3	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	8.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature	Degree C	-	-	28.6	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	320	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ๖-323-๖-9460 , Thanasoun Namakunna ทะเบียนเลขที่ ๖-204-๖-8592

Remark :

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

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

N. Banchongkit

Narumon Banchongkit
Supervisor

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ภาคผนวก ง.4

ใบรับรองผลการตรวจวัดระดับเสียง



Noise Monitoring Result : Community Noise MTR-UNT & UUCP

Location : Ban Pluak Kate
SLM Model : RION NL-21
Site Operator : Mr. Sittichai Sawangwongchai

Monitor Period : 01-02 Jul 2022
Serial No : 00487719

Calibrator Model : RION NC-74
Calibration Ref dB(A) : 94.0
SLM Reading / Adjust dB(A) : 93.9/0.1
Cal Sheet No. : NC-74-2022-073


Serial No : 34283648
Certified Date : 24 Dec 2021
Expire Date : 23 Dec 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	01-02 Jul 2022	
12:00 - 13:00	57.9	
13:00 - 14:00	57.7	
14:00 - 15:00	58.6	
15:00 - 16:00	59.6	
16:00 - 17:00	56.4	
17:00 - 18:00	56.0	
18:00 - 19:00	55.7	
19:00 - 20:00	54.8	
20:00 - 21:00	54.0	
21:00 - 22:00	53.0	
22:00 - 23:00	52.2	
23:00 - 00:00	51.6	
00:00 - 01:00	52.2	
01:00 - 02:00	52.1	
02:00 - 03:00	52.0	
03:00 - 04:00	53.0	
04:00 - 05:00	52.3	
05:00 - 06:00	53.3	
06:00 - 07:00	54.0	
07:00 - 08:00	55.2	
08:00 - 09:00	55.2	
09:00 - 10:00	55.1	
10:00 - 11:00	55.1	
11:00 - 12:00	55.1	
Leq(24)*	55.3	
Ldn	59.8	
Lmax **	92.2	
Standard-24Hr	70 dB(A)	
Standard-Max	115 dB(A)	

Remark : * Average time between 12:00-12:00

** Maximum Sound Pressure Level between 12:00-12:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise MTR-UNT & UUCP

Location : Ban Pluak Kate

Monitor Period : 01-02 Jul 2022

SLM Model : RION NL-21

Serial No : 00487719

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 24 Dec 2021

SLM Reading / Adjust dB(A) : 93.9/0.1

Expire Date : 23 Dec 2022

Cal Sheet No. : NC-74-2022-073

Time	L90 (dB(A))
	01-02 Jul 2022
12:00 - 13:00	55.2
13:00 - 14:00	55.5
14:00 - 15:00	56.0
15:00 - 16:00	54.1
16:00 - 17:00	54.6
17:00 - 18:00	54.0
18:00 - 19:00	52.9
19:00 - 20:00	52.9
20:00 - 21:00	52.0
21:00 - 22:00	50.6
22:00 - 23:00	49.7
23:00 - 00:00	49.6
00:00 - 01:00	50.0
01:00 - 02:00	50.4
02:00 - 03:00	50.2
03:00 - 04:00	51.2
04:00 - 05:00	50.5
05:00 - 06:00	51.4
06:00 - 07:00	51.7
07:00 - 08:00	52.6
08:00 - 09:00	53.1
09:00 - 10:00	53.3
10:00 - 11:00	53.1
11:00 - 12:00	53.2
L90(avg)*	52.8

Remark : * Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Community Noise MTR-UNT & UUCP

Location : Ban Na Pun R.7

Monitor Period : 01-02 Jul 2022

SLM Model : RION NL-21

Serial No : 00187497

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 24 Dec 2021

SLM Reading / Adjust dB(A) : 93.9/0.1


Expire Date : 23 Dec 2022


Cal Sheet No. : NC-74-2022-073

Time	Equivalent Sound Pressure Level (dB(A))	
	01-02 Jul 2022	
11:00 - 12:00	52.3	
12:00 - 13:00	49.8	
13:00 - 14:00	50.7	
14:00 - 15:00	51.9	
15:00 - 16:00	51.0	
16:00 - 17:00	51.9	
17:00 - 18:00	53.1	
18:00 - 19:00	57.8	
19:00 - 20:00	50.6	
20:00 - 21:00	50.0	
21:00 - 22:00	50.4	
22:00 - 23:00	49.5	
23:00 - 00:00	49.2	
00:00 - 01:00	49.8	
01:00 - 02:00	50.9	
02:00 - 03:00	51.3	
03:00 - 04:00	51.3	
04:00 - 05:00	49.9	
05:00 - 06:00	50.1	
06:00 - 07:00	50.6	
07:00 - 08:00	51.0	
08:00 - 09:00	49.8	
09:00 - 10:00	49.0	
10:00 - 11:00	47.9	
Leq(24)*	51.4	
Ldn	57.0	
Lmax **	91.4	
Standard-24Hr	70 dB(A)	
Standard-Max	115 dB(A)	

Remark : * Average time between 11:00-11:00

** Maximum Sound Pressure Level between 11:00-11:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise MTR-UNT & UUCP

Location : Ban Na Pun R.7

Monitor Period : 01-02 Jul 2022

SLM Model : RION NL-21

Serial No : 00187497

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 24 Dec 2021

SLM Reading / Adjust dB(A) : 93.9/0.1

Expire Date : 23 Dec 2022

Cal Sheet No. : NC-74-2022-073

Time	L90 (dB(A))
	01-02 Jul 2022
11:00 - 12:00	49.0
12:00 - 13:00	48.4
13:00 - 14:00	49.6
14:00 - 15:00	50.1
15:00 - 16:00	49.5
16:00 - 17:00	50.2
17:00 - 18:00	50.7
18:00 - 19:00	50.7
19:00 - 20:00	49.1
20:00 - 21:00	48.4
21:00 - 22:00	48.1
22:00 - 23:00	47.8
23:00 - 00:00	48.1
00:00 - 01:00	48.6
01:00 - 02:00	49.2
02:00 - 03:00	49.0
03:00 - 04:00	49.8
04:00 - 05:00	48.5
05:00 - 06:00	48.8
06:00 - 07:00	49.2
07:00 - 08:00	49.2
08:00 - 09:00	48.2
09:00 - 10:00	47.1
10:00 - 11:00	46.6
L90(avg)*	49.0

Remark : * Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Community Noise MTR-UNT & UUCP

Location : North Fence of Project Site

Monitor Period : 01-02 Jul 2022

SLM Model : RION NL-21

Serial No : 00487734

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 24 Dec 2021

SLM Reading / Adjust dB(A) : 93.9/0.1

Expire Date : 23 Dec 2022

Cal Sheet No. : NC-74-2022-073

Time	Equivalent Sound Pressure Level (dB(A))	
	01-02 Jul 2022	
13:00 - 14:00	57.4	
14:00 - 15:00	56.7	
15:00 - 16:00	56.9	
16:00 - 17:00	56.6	
17:00 - 18:00	57.2	
18:00 - 19:00	57.3	
19:00 - 20:00	56.6	
20:00 - 21:00	56.3	
21:00 - 22:00	56.1	
22:00 - 23:00	55.9	
23:00 - 00:00	56.1	
00:00 - 01:00	56.4	
01:00 - 02:00	56.7	
02:00 - 03:00	57.1	
03:00 - 04:00	57.0	
04:00 - 05:00	56.6	
05:00 - 06:00	56.1	
06:00 - 07:00	56.1	
07:00 - 08:00	56.3	
08:00 - 09:00	56.6	
09:00 - 10:00	56.8	
10:00 - 11:00	56.7	
11:00 - 12:00	56.4	
12:00 - 13:00	56.5	
Leq(24)*	56.6	
Ldn	62.9	
Lmax **	75.5	
Standard-24Hr	70 dB(A)	
Standard-Max	115 dB(A)	

Remark : * Average time between 13:00-13:00

** Maximum Sound Pressure Level between 13:00-13:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise MTR-UNT & UUCP

Location : North Fence of Project Site

Monitor Period : 01-02 Jul 2022

SLM Model : RION NL-21

Serial No : 00487734

Site Operator : Mr. Sittichai Sawangwongchai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 24 Dec 2021

SLM Reading / Adjust dB(A) : 93.9/0.1

Expire Date : 23 Dec 2022

Cal Sheet No. : NC-74-2022-073

Time	L90 (dB(A))
	01-02 Jul 2022
13:00 - 14:00	56.3
14:00 - 15:00	56.2
15:00 - 16:00	56.4
16:00 - 17:00	56.2
17:00 - 18:00	56.5
18:00 - 19:00	56.5
19:00 - 20:00	56.2
20:00 - 21:00	55.9
21:00 - 22:00	55.8
22:00 - 23:00	55.7
23:00 - 00:00	55.8
00:00 - 01:00	56.0
01:00 - 02:00	56.2
02:00 - 03:00	56.4
03:00 - 04:00	56.3
04:00 - 05:00	56.1
05:00 - 06:00	55.6
06:00 - 07:00	55.8
07:00 - 08:00	55.9
08:00 - 09:00	56.2
09:00 - 10:00	56.2
10:00 - 11:00	55.9
11:00 - 12:00	55.9
12:00 - 13:00	56.1
L90(avg)*	56.1

Remark : * Average time between 13:00-13:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT

Location : (Chemical Preparation Section)-Nylon 1
SLM Model : Cirrus CR162B
Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Monitor Period : Jul 04, 2022
Serial No : G302333

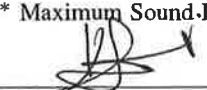
Calibrator Model : Cirrus CR:515
Calibration Ref dB(A) : 94.0
SLM Reading / Adjust dB(A) : 93.7/0.1
Cal Sheet No. : CR-515-2022-056


Serial No : 94296
Certified Date : Dec 24, 2021
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))
	Jul 04, 2022
00:00 - 01:00	
01:00 - 02:00	
02:00 - 03:00	
03:00 - 04:00	
04:00 - 05:00	
05:00 - 06:00	
06:00 - 07:00	
07:00 - 08:00	
08:00 - 09:00	
09:00 - 10:00	61.7
10:00 - 11:00	63.7
11:00 - 12:00	65.7
12:00 - 13:00	64.7
13:00 - 14:00	63.8
14:00 - 15:00	66.0
15:00 - 16:00	64.9
16:00 - 17:00	63.0
17:00 - 18:00	
18:00 - 19:00	
19:00 - 20:00	
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(8)*	64.4
Lmax **	87.5
Standard-8Hr	90 dB(A)
Standard-Max	140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound-Pressure Level between 09:00-17:00


 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist


 (Miss Sununta Sirawuttinanon)
 Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT

Location : (Drying Section)-Nylon 1

Monitor Period : Jul 04, 2022

SLM Model : Cirrus CR162B

Serial No : G302738

Site Operator : Mr. Bawom D. / Ms. Kanittha Ch.

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 93.7/0.1


Expire Date : Dec 23, 2022


Cal Sheet No. : CR-515-2022-056

Time	Equivalent Sound Pressure Level (dB(A))
	Jul 04, 2022
00:00 - 01:00	
01:00 - 02:00	
02:00 - 03:00	
03:00 - 04:00	
04:00 - 05:00	
05:00 - 06:00	
06:00 - 07:00	
07:00 - 08:00	
08:00 - 09:00	
09:00 - 10:00	83.3
10:00 - 11:00	81.9
11:00 - 12:00	84.6
12:00 - 13:00	83.9
13:00 - 14:00	83.7
14:00 - 15:00	83.8
15:00 - 16:00	84.3
16:00 - 17:00	83.2
17:00 - 18:00	
18:00 - 19:00	
19:00 - 20:00	
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(8)*	83.7
Lmax **	96.8
Standard-8Hr	90 dB(A)
Standard-Max	140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT

Location : (Under Strand Granulator)-Nylon 1
SLM Model : Cirrus CR162B
Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Monitor Period : Jul 04, 2022
Serial No : G302737

Calibrator Model : Cirrus CR:515
Calibration Ref dB(A) : 94.0
SLM Reading / Adjust dB(A) : 93.7/0.2
Cal Sheet No. : CR-515-2022-056

Serial No : 94296
Certified Date : Dec 24, 2021
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	84.1	
10:00 - 11:00	84.4	
11:00 - 12:00	84.8	
12:00 - 13:00	84.9	
13:00 - 14:00	85.1	
14:00 - 15:00	84.3	
15:00 - 16:00	84.5	
16:00 - 17:00	84.9	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	84.6	
Lmax **	94.5	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Sununta Sirawuttinanon)
 Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT

Location : (Extraction Column)-Nylon 1

Monitor Period : Jul 04, 2022

SLM Model : Cirrus CR162B

Serial No : G302743

Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 93.7/-0.1

Expire Date : Dec 23, 2022


Cal Sheet No. : CR-515-2022-056

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	84.6	
10:00 - 11:00	84.6	
11:00 - 12:00	85.3	
12:00 - 13:00	85.1	
13:00 - 14:00	85.1	
14:00 - 15:00	85.1	
15:00 - 16:00	85.3	
16:00 - 17:00	85.1	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	85.0	
Lmax **	102.7	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UUCP

Location : (Chemical Preparation Section)-Nylon 2
SLM Model : Cirrus CR162B
Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Monitor Period : Jul 04, 2022
Serial No : G302330

Calibrator Model : Cirrus CR:515
Calibration Ref dB(A) : 94.0
SLM Reading / Adjust dB(A) : 93.7/-0.2
Cal Sheet No. : CR-515-2022-057

Serial No : 94296
Certified Date : Dec 24, 2021
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	81.6	
10:00 - 11:00	82.6	
11:00 - 12:00	83.0	
12:00 - 13:00	82.5	
13:00 - 14:00	83.0	
14:00 - 15:00	82.4	
15:00 - 16:00	82.6	
16:00 - 17:00	83.1	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	82.6	
Lmax **	97.8	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UUCP

Location : (Drying Section)-Nylon 2

Monitor Period : Jul 04, 2022

SLM Model : Cirrus CR162B

Serial No : G302741

Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 93.7/-0.2

Expire Date : Dec 23, 2022

Cal Sheet No. : CR-515-2022-057

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		85.3
10:00 - 11:00		85.4
11:00 - 12:00		85.5
12:00 - 13:00		85.6
13:00 - 14:00		85.5
14:00 - 15:00		85.4
15:00 - 16:00		85.3
16:00 - 17:00		84.3
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	85.3	
Lmax **	88.6	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UUCP

Location : (Under Strand Granulator)-Nylon 2
SLM Model : Cirrus CR162B
Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Monitor Period : Jul 04, 2022
Serial No : G302237

Calibrator Model : Cirrus CR:515
Calibration Ref dB(A) : 94.0
SLM Reading / Adjust dB(A) : 93.7/0.0
Cal Sheet No. : CR-515-2022-057

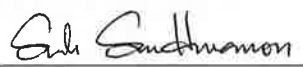
Serial No : 94296
Certified Date : Dec 24, 2021
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	84.8	
10:00 - 11:00	84.7	
11:00 - 12:00	84.7	
12:00 - 13:00	84.7	
13:00 - 14:00	84.6	
14:00 - 15:00	84.6	
15:00 - 16:00	84.6	
16:00 - 17:00	84.5	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	84.7	
Lmax **	89.1	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UUCP

Location : (Extraction Column)-Nylon 2

Monitor Period : Jul 04, 2022

SLM Model : Cirrus CR162B

Serial No : G302740

Site Operator : Mr. Baworn D. / Ms. Kanittha Ch.

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 93.7/-0.1


Expire Date : Dec 23, 2022


Cal Sheet No. : CR-515-2022-057

Time	Equivalent Sound Pressure Level (dB(A))	
	Jul 04, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	85.2	
10:00 - 11:00	85.2	
11:00 - 12:00	85.2	
12:00 - 13:00	85.2	
13:00 - 14:00	85.1	
14:00 - 15:00	85.1	
15:00 - 16:00	85.1	
16:00 - 17:00	85.1	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	85.2	
Lmax **	89.3	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT&UUCP

Location : (Chemical Preparation Section)-Nylon 1

Monitor Period : Dec 21, 2022

SLM Model : Cirrus CR162B

Serial No : G302330

Site Operator : Mr. Jeerawat Khothamhan

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 94.0/0.0

Expire Date : Dec 23, 2022


Cal Sheet No. : CR-515-2022-164

Time	Equivalent Sound Pressure Level (dB(A))	
	Dec 21, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		65.4
10:00 - 11:00		64.4
11:00 - 12:00		66.2
12:00 - 13:00		64.5
13:00 - 14:00		63.8
14:00 - 15:00		58.3
15:00 - 16:00		58.5
16:00 - 17:00		68.3
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*		64.7
Lmax **		86.6
Standard-8Hr		90 dB(A)
Standard-Max		140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT&UUCP

Location : (Drying Section)-Nylon 1

Monitor Period : Dec 21, 2022

SLM Model : Cirrus CR162B

Serial No : G302741

Site Operator : Mr. Jeerawat Khothamhan

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 94.0/0.0


Expire Date : Dec 23, 2022

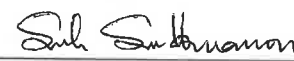
Cal Sheet No. : CR-515-2022-164

Time	Equivalent Sound Pressure Level (dB(A))	
	Dec 21, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		78.6
10:00 - 11:00		79.2
11:00 - 12:00		80.5
12:00 - 13:00		78.9
13:00 - 14:00		78.4
14:00 - 15:00		74.1
15:00 - 16:00		74.4
16:00 - 17:00		73.7
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*		77.9
Lmax **		94.8
Standard-8Hr		90 dB(A)
Standard-Max		140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT&UUCP

Location : (Under Strand Granulator)-Nylon 1

Monitor Period : Dec 21, 2022

SLM Model : Cirrus CR162B

Serial No : G300709

Site Operator : Mr. Jeerawat Khothamhan

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 94.0/0.0

Expire Date : Dec 23, 2022

Cal Sheet No. : CR-515-2022-164

Time	Equivalent Sound Pressure Level (dB(A))	
	Dec 21, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		83.6
10:00 - 11:00		83.6
11:00 - 12:00		85.7
12:00 - 13:00		82.1
13:00 - 14:00		82.0
14:00 - 15:00		82.1
15:00 - 16:00		84.1
16:00 - 17:00		82.2
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*		83.4
Lmax **		108.1
Standard-8Hr		90 dB(A)
Standard-Max		140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-UNT&UUCP

Location : (Extraction Column)-Nylon 1

Monitor Period : Dec 21, 2022

SLM Model : Cirrus CR162B

Serial No : G302740

Site Operator : Mr. Jeerawat Khothamhan

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Dec 24, 2021

SLM Reading / Adjust dB(A) : 94.0/0.0

Expire Date : Dec 23, 2022

Cal Sheet No. : CR-515-2022-164

Time	Equivalent Sound Pressure Level (dB(A))	
	Dec 21, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		84.1
10:00 - 11:00		85.9
11:00 - 12:00		86.3
12:00 - 13:00		83.1
13:00 - 14:00		83.0
14:00 - 15:00		83.0
15:00 - 16:00		84.3
16:00 - 17:00		84.0
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	84.4	
Lmax **	106.9	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Sule Sundharamon

(Miss Sununta Sirawuttinanon)
Technical Management Team

ภาคผนวก ง.5

ใบรับรองผลการตรวจวัดระดับความร้อนในพื้นที่ทำงาน



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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO. :	222032 Cert-Heat_UNT (Jul 22) (1)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor		
MEASUREMENT DATE	: 04/07/2022	MODEL NO.	: JT2011-E2A	SERIAL NO.	3522210174
MEASUREMENT LOCATION	: UNT	SITE OPERATOR	: Mr. Baworn D. / Ms. Kanittha Ch.		

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Drying Section (Nylon 1)	10.10-10.40	29.1	35.2	35.4	31.0	31.1	34.0
	10.40-11.10	29.1	35.3	35.5	31.0		
	11.10-11.40	29.2	35.2	35.4	31.1		
	11.40-12.10	29.3	35.3	35.6	31.2		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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DB = Dry Bulb Temperature
GT = Globe Temperature
WBGT = Wet Bulb Globe Temperature
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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO.	: 222032 Cert-Heat_UNT (Jul 22) (2)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor		
MEASUREMENT DATE	: 04/07/2022	MODEL NO.	: JT2011-E2A	SERIAL NO.	: 3522210173
MEASUREMENT LOCATION	: UNT	SITE OPERATOR	: Mr. Baworn D. / Ms. Kanittha Ch.		

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Chemical Preparation Section	10.11-10.41	18.5	23.8	24.1	20.2	20.3	34.0
(Nylon 1)	10.41-11.11	18.7	23.9	24.3	20.4		
	11.11-11.41	18.6	23.7	24.2	20.3		
	11.41-12.11	18.5	23.6	24.4	20.3		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO. :	222032 Cert-Heat_UNT (Jul 22) (3)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor		
MEASUREMENT DATE	: 04/07/2022	MODEL NO.	: JT2011-E2A	SERIAL NO.	3522210173
MEASUREMENT LOCATION	: UNT	SITE OPERATOR	: Mr. Baworn D. / Ms. Kanittha Ch.		

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Polymerizer (Nylon 1)	12.15-12.45	27.2	32.1	33.1	29.0	29.1	34.0
	12.45-13.15	27.3	32.0	33.2	29.1		
	13.15-13.45	27.2	32.2	33.3	29.0		
	13.45-14.15	27.4	32.3	33.2	29.1		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

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Technical Management Team

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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222032 Cert-Heat_UUCP (Jul 22) (1)
MEASUREMENT BY : SECOT Co., Ltd. INSTRUMENT : Area Heat Stress Monitor
MEASUREMENT DATE : 04/07/2022 MODEL NO. : JT2011-E2A SERIAL NO. : 3522210174
MEASUREMENT LOCATION : UUCP SITE OPERATOR : Mr. Baworn D. / Ms. Kanittha Ch.

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Drying Section	12.18-12.48	27.7	32.9	33.1	29.3	29.4	34.0
(Nylon 2)	12.48-13.18	27.8	33.0	33.2	29.4		
	13.18-13.48	27.6	33.1	33.3	29.3		
	13.48-14.18	27.9	33.2	33.4	29.6		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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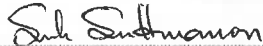
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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO. :	222032 Cert-Heat_UUCP (Jul 22) (2)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor
MEASUREMENT DATE	: 04/07/2022	MODEL NO.	: JT2011-E2A
		SERIAL NO.	: 3522210174
MEASUREMENT LOCATION	: UUCP	SITE OPERATOR	: Mr. Baworn D. / Ms. Kanittha Ch.

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Chemical Preparation Section	14.22-14.52	27.1	31.6	31.9	28.5	28.6	34.0
(Nylon 2)	14.52-15.22	27.2	31.7	32.0	28.6		
	15.22-15.52	27.1	31.8	31.8	28.5		
	15.52-16.22	27.3	31.6	31.7	28.6		


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team

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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222032 Cert-Heat_UUCP (Jul 22) (3)
MEASUREMENT BY : SECOT Co., Ltd. INSTRUMENT : Area Heat Stress Monitor
MEASUREMENT DATE : 04/07/2022 MODEL NO. : JT2011-E2A SERIAL NO. : 3522210173
MEASUREMENT LOCATION : UUCP SITE OPERATOR : Mr. Baworn D. / Ms. Kanittha Ch.

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Polymerizer	14.20-14.50	29.1	36.1	36.9	31.4	31.5	34.0
(Nylon 2)	14.50-15.20	29.2	36.2	37.0	31.5		
	15.20-15.50	29.3	36.3	36.9	31.6		
	15.50-16.20	29.2	36.1	36.9	31.5		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO.	: 222032 Cert-Heat_UNT (Dec 22) (1)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor		
MEASUREMENT DATE	: 21/12/2022	MODEL NO.	: JT2011-E2A	SERIAL NO.	3522210180
MEASUREMENT LOCATION	: UNT	SITE OPERATOR	: Mr. Jeerawat Khothamhan		

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Drying Section	10.09-10.39	24.4	32.5	32.7	26.9	27.3	34.0
(Nylon 1)	10.39-11.09	24.6	33.1	33.4	27.2		
	11.09-11.39	25.2	33.9	34.1	27.9		
	11.39-12.09	24.4	32.9	33.9	27.3		

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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DB = Dry Bulb Temperature

GT = Globe Temperature

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HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO. :	222032 Cert-Heat_UNT (Dec 22) (2)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	:	Area Heat Stress Monitor	
MEASUREMENT DATE	: 21/12/2022	MODEL NO.	:	JT2011-E2A	SERIAL NO. 3522210172
MEASUREMENT LOCATION	: UNT	SITE OPERATOR	:	Mr. Jeerawat Khothamhan	

LOCATION	TIME	MEASURED TEMPERATURE (°C)					STANDARD (°C) *
		NWB	DB	GT	WBGT _{in}	WBGT (Avg.)	WBGT
Chemical Preparation Section (Nylon 1)	10.05-10.35	14.4	18.9	19.0	15.8	15.9	34.0
	10.35-11.05	14.3	18.9	19.1	15.7		
	11.05-11.35	14.5	18.8	19.1	15.9		
	11.35-12.05	14.6	18.9	19.3	16.0		


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team

- Remark :
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 2. This report shall not be reproduced, except in full, without official approval.
 3. * WBGT Standard was notified by the Ministerial Regulation of Labour, B.E.2559 (2016).
 4. NWB = Natural Wet Bulb Temperature
DB = Dry Bulb Temperature
GT = Globe Temperature
WBGT = Wet Bulb Globe Temperature
 5. Work Load : Light work load = 34.0 °C, Moderate work load = 32.0 °C and Heavy work load = 30.0 °C



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SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

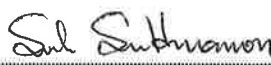
TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

HEAT STRESS MEASUREMENT REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO. :	222032 Cert-Heat_UNT (Dec 22) (3)		
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Area Heat Stress Monitor		
MEASUREMENT DATE	: 21/12/2022	MODEL NO. :	JT2011-E2A	SERIAL NO.	3522210180
MEASUREMENT LOCATION	: UNT	SITE OPERATOR :	Mr. Jeerawat Khothamhan		

LOCATION	TIME	MEASURED TEMPERATURE (°C)				STANDARD (°C) *	
		NWB	DB	GT	WBGT _{In}	WBGT (Avg.)	WBGT
Polymerizer	13.09-13.39	25.3	32.9	33.7	27.8	27.9	34.0
(Nylon 1)	13.39-14.09	25.3	32.8	33.6	27.8		
	14.09-14.39	25.1	32.6	33.6	27.7		
	14.39-15.09	25.6	33.0	33.8	28.1		


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team

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DB = Dry Bulb Temperature
GT = Globe Temperature
WBGT = Wet Bulb Globe Temperature
 5. Work Load : Light work load = 34.0 °C, Moderate work load = 32.0 °C and Heavy work load = 30.0 °C

ภาคผนวก ง.6

ใบรับรองผลการตรวจวิเคราะห์คุณภาพอากาศในพื้นที่ทำงาน



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 1421/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 04/07/2022
Address	: 140/8 Moo 4 , Ta-Phong Sub-District , Muang District , Rayong Province 21000	Received Date	: 05/07/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 11/07/2022
		Report Date	: 15/07/2022

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Filtration
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time		Method	mg/m ³	mg/m ³	mg/m ³
โรงงานโฆจภัณฑ์ (UNT) - Nylon 1						
บริเวณเตรียมสารเคมี	04/07/2022	Total dust	NIOSH 0500 /Microbalance	< 0.25	ND	15
(Chemical Preparation Section)	10:05-12:05					

Analyst By : Phatchara Samanchan
(Miss Phatchara Samanchan)

Approved By : Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

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3. Notification of the Occupational Safety and Health Administration (OSHA), B.E. 2555 (2012).

4. ND = non-detectable.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 1421/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 04/07/2022
Address	: 140/8 Moo 4 , Ta-Phong Sub-District , Muang District , Rayong Province 21000	Received Date	: 05/07/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 12/07/2022
		Report Date	: 15/07/2022

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time			ppm	ppm	ppm
โรงงานปิโตรเคมี (UNT) - Nylon 1						
กระบวนการอบแห้ง (Drying Section)	04/07/2022	Caprolactam	OSHA PV 2012/HPLC	< 0.02	ND	-
	10:04-11:44					
บริเวณหน่วยบดตัดเม็ด (Under Strand Granulator)	04/07/2022	Caprolactam	OSHA PV 2012/HPLC	< 0.02	0.02	-
	10:03-11:43					

Analyst By : Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Approved By : Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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4. - No Standard.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 1421/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 04/07/2022
Address	: 140/8 Moo 4 , Ta-Phong Sub-District , Muang District , Rayong Province 21000	Received Date	: 05/07/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 11/07/2022
		Report Date	: 15/07/2022

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Filtration
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time					
			Method	mg/m ³	mg/m ³	mg/m ³
โรงงานเพิ่มกำลังการผลิต (UUCP) - Nylon 2						
บริเวณเตรียมสารเคมี	04/07/2022	Total dust	NIOSH 0500 /Microbalance	< 0.25	ND	15
(Chemical Preparation Section)	10:13-12:13					

Analyst By : Phatchara Samanchan
(Miss Phatchara Samanchan)

Approved By : Naris Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 1421/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 04/07/2022
Address	: 140/8 Moo 4 , Ta-Phong Sub-District , Muang District , Rayong Province 21000	Received Date	: 05/07/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 12/07/2022
		Report Date	: 15/07/2022

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time			ppm	ppm	ppm
โรงงานเพิ่มกำลังการผลิต (UUCP) - Nylon 2						
กระบวนการอบแห้ง (Drying Section)	04/07/2022	Caprolactam	OSHA PV 2012/HPLC	< 0.02	ND	
	10:11-11:51					
บริเวณหน่วยตัดเม็ดใต้น้ำ (Under Water Granulator)	04/07/2022	Caprolactam	OSHA PV 2012/HPLC	< 0.02	0.02	
	10:09-11:49					

Analyst By :

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Approved By :

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 2535/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 21/12/2022
Address	: 140/8 Moo 4 , Ta-Phong Sub-District , Muang District , Rayong Province 21000	Received Date	: 23/12/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 26/12/2022
		Report Date	: 06/01/2023

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Filtration
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time		Method	mg/m ³	mg/m ³	mg/m ³
Nylon 1- โรงเก่า (UNT)						
บริเวณเตรียมสารเคมี	21/12/2022	Total dust	NIOSH 0500 /Microbalance	< 0.25	ND	15
(Chemical Preparation Section)	09:20-13:20					

Analyst By : Phatchara Samanchan
(Miss Phatchara Samanchan)

Approved By : Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 2535/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 21/12/2022
Address	: 140/8 Moo 4, Ta-Phong Sub-District, Muang District, Rayong Province 21000	Received Date	: 23/12/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 05/01/2023
		Report Date	: 06/01/2023

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling	Compound	Analytical	ND	RESULT	STANDARD
	Date/Time			Method	ppm	ppm
Nylon 1- โรงเก็บ (UNT)						
กระบวนการอบแห้ง (Drying Section)	21/12/2022	Caprolactam	OSHA PV 2012/HPLC	< 0.02	ND	
	09:32-13:32					

Analyst By :

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Approved By :

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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4. - No Standard.

ภาคผนวก จ

ใบแสดงการตรวจเทียบเครื่องมือ



High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 14, 2022

Hi-Vol Pump No. : BH-001 Indicator No. : CM-01

Amb. Temp (°C) : 25 Press (mmHg) : 760

Calibration by : Mr.Punkawin K.

Plate	Indicate (X) (cm.)	True H ₂ O (in.)	Actual Flow (Y) (cfm)	XY	X ²	Remark
18	17.40	12.60	59.07	1,027.82	302.76	
13	14.40	10.10	53.20	766.08	207.36	
10	11.40	7.80	46.90	534.66	129.96	
7	7.20	5.00	37.81	272.23	51.84	
5	4.40	3.00	226.60	997.04	19.36	
Sum	54.80	38.50	423.58	3,597.83	711.28	

Calibrated by : Punkawin Approved by : Wittaya K



High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 14, 2022
Hi-Vol Pump No. : BH-008 Indicator No. : CM-01
Amb. Temp (°C) : 25 Press (mmHg) : 760
Calibration by : Mr.Punkawin K.

Plate	Indicate (X) (cm.)	True H ₂ O (in.)	Actual Flow (Y) (cfm)	XY	X ²	Remark
18	17.40	12.50	58.84	1,023.82	302.76	
13	14.40	10.10	53.20	766.08	207.36	
10	11.60	7.80	46.90	544.04	134.56	
7	7.60	5.10	38.17	290.09	57.76	
5	4.80	3.10	30.04	144.19	23.04	
Sum	55.80	38.60	227.15	2,768.22	725.48	

Calibrated by : Punkawin Approved by : Mr. Haya K.



Analyzer Performance Test

Date : 13 Jan 22

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	No
Brand :	API
Model :	T 200
S/N :	110

Dilutor	: Teledyne T 700 1367
Zero Air	: M701 S/N 1039
STD GAS	: EB0108319

NO Single Point Calibration

Supply Gas	Ref Value	Analyzer Disp.	Zero-Span Error %	Slope - Offset
Zero	0.0	0.7	-	-
Span	450.0	449.7	-0.07	0.933

NO MultiPoint Calibration

Ref Value	Analyzer Disp.	Output Difference		
		Diff	Percent Diff	Percent Diff abs.
0.00	0.70	0.7	-	-
100.00	105.80	5.8	5.8	5.8
200.00	204.20	4.2	2.1	2.1
400.00	402.30	2.3	0.6	0.6
			Average Diff (%)	2.8

Calibrated by :

Approved by :



Analyzer Performance Test

Date : 13 Jan 22

Temp: (°C) 25

Barometric Pressure: Pb (mmHg) 760

Analyzer Type :	Nox
Brand :	API
Model :	T 200
S/N :	110

Dilutor	: Teledyne T 700 1367
Zero Air	: M701 S/N 1039
STD GAS	: EB0108319

NOx Single Point Calibration

Supply Gas	Ref Value	Analyzer Disp.	Zero-Span Error %	Slope - Offset
Zero	0.0	0.7	-	-
Span	450.0	449.6	-0.09	0.933

NOx MultiPoint Calibration

Ref Value	Analyzer Disp.	Output Difference		
		Diff	Percent Diff	Percent Diff abs.
0.00	0.70	0.7	-	-
100.00	106.70	6.7	6.7	6.7
200.00	205.10	5.1	2.6	2.6
400.00	401.80	1.8	0.5	0.5
			Average Diff (%)	3.2

Calibrated by :

Approved by :

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E15AC084	Reference Number:	82-401409170-1
Cylinder Number:	EB0108319	Cylinder Volume:	144.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52019	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 05, 2019

Expiration Date: Feb 05, 2023

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

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.93 PPM	G1	+/- 1.4% NIST Traceable	01/28/2019, 02/05/2019
NITRIC OXIDE	50.00 PPM	50.82 PPM	G1	+/- 1.4% NIST Traceable	01/28/2019, 02/05/2019
SULFUR DIOXIDE	50.00 PPM	48.82 PPM	G1	+/- 1.0% NIST Traceable	01/28/2019, 02/05/2019
CARBON MONOXIDE	0.5000 %	0.5040 %	G1	+/- 1.1% NIST Traceable	01/31/2019
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060206	CC401947	4950 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Feb 15, 2019
PRM	12367	APEX1089237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
NTRM	12010724	KAL004497	50.03 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Mar 12, 2024
GMIS	1114201601	CC506710	4.971 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019
NTRM	14010327	KAL004376	49.08 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Apr 17, 2024

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

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens Ultramat 6 J3-599 COHIGH	NDIR	Jan 18, 2019
Nicolet 6700 APW1100391 NO	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 NO2	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 SO2	FTIR	Jan 10, 2019

Triad Data Available Upon Request

PERMANENT NOTES: PRODUCED IN ACCORDANCE WITH ISO17025 REQUIREMENTS

NOTES:

Gross Weight: 27806.3 grams

Net Weight: 4733.2 grams

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All measurements are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3082.05

D. Kloss
 Approved for Release



CONTROL UNIT CALIBRATION

(Metric units, mm)

Date

9 Jan 21

Initial

Final

Average

Barometric press, Pb

757

757

757

mmHg

Dry Gas Meter Data

Console No.

M50-07

Metering System ID

DGM Number

90331

DGM Model

MST-C2-1

Calibrated by Montri P.

Reference Dry Gas Meter Data

Serial No.

358794

Model

S110

Correction factor (Yr)

1.0096

Last Calibration Date

19 Dec 20

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V _r Liters	DGM Volume V _m Liters	Temperature (°C)				Time ⊙ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T _r	Dry Gas Meter					
				Inlet T _i	Outlet T _o	Avg T _m			
12.5	100.0	100.0	25	25	25	25.0	8.19	1.0083	37.8946
25.0	100.0	99.5	25	25	25	25.0	6.45	1.0122	47.0066
50.0	100.0	99.2	25	25	25	25.0	4.22	1.0128	40.2434
76.0	100.0	100.4	25	26	26	26.0	3.55	1.0015	43.1435
100.0	100.0	100.1	25	26	26	26.0	3.55	1.0022	41.9029
150.0	100.0	99.8	25	26	26	26.0	2.55	1.0004	43.9356
Average								1.0062	42.3545

Approved by :

(Miss Katesarin Vorradetwittaya)



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 14/01/2022

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS10-01

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	7.55	10.75	0.8380	0.0032
2	7.55	10.75	0.8380	0.0032
3	7.55	11.00	0.8285	-0.0064

C_{P(A),avg} 0.8349

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	7.55	11.00	0.8285	-0.0097
2	7.55	10.75	0.8380	-0.0001
3	7.55	10.50	0.8480	0.0098

C_{P(B),avg} 0.8382

| CP(A)-CP(B) | = 0.0033

C_{P(Avg)} = 0.8365

Approved by : 
(Miss Katesarin Vorradetwittaya)

*** δ must be ≤ 0.01 for the test to be acceptable ****** | Cp(A)-Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is to be used ***



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 14/01/2022

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS10-02

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	7.55	10.75	0.8380	0.0095
2	7.55	11.00	0.8285	-0.0001
3	7.55	11.25	0.8192	-0.0094

C_{P(A),avg} 0.8286

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	7.55	10.75	0.8380	0.0000
2	7.55	10.75	0.8380	0.0000
3	7.55	10.75	0.8380	0.0000

C_{P(B),avg} 0.8380

| CP(A)-CP(B) | = 0.0095

C_{P(Avg)} = 0.8333

Approved by : 
(Miss Katesarin Vorradetwittaya)

*** δ must be ≤ 0.01 for the test to be acceptable ***
 *** | Cp(A)-Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is to be used ***

**SOUND LEVEL METER CALIBRATION**

Calibration Location: SECOT

Calibration Date: Jul 1, 22

SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
RION	NC-74	34283648	94.00	1000

No.	Brand	Model	Serial No.	Microphone Serial No.	SLM Reading (dB)	dB Adjust
42	RION	NL-21	00187497	117801	93.9	0.1
62	RION	NL-21	00487719	118988	93.9	0.1
77	RION	NL-21	00487734	119006	93.9	0.1

Calibrated by :

Approved by :

Preeda S.



**ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT**

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Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860-8 Fax: +66 2324 0917-8



Certificate No.: CP20210095EA

Operation No.: CP2021120016

Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: RION

Model/Type: NC-74

Serial No.: 34283648

ID No.: -

Customer: SECOT Co.,Ltd.

Address: 239 Rimklongprapa Rd., Bangsue,
Bangkok 10800 Thailand

Received Date: 21 December 2021

Calibrated Date: 24 December 2021

Issued Date: 28 December 2021

Calibrated by: Ms. Juntaporn Kunhakom

Approved by: _____

(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

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

Certificate No.: CP20210095EA

Calibration Report

Equipment: Sound Calibrator
Manufacturer: RION
Model/Type: NC-74
Serial No.: 34283648
ID No.: -
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-

IEC 60942:2017

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1010-21	13 June 2022
2) Waveform Generator	33511B	MY52302264	0144RF21	17 June 2022
3) Audio Analyzing DMM	2015-P	4079144	E1U210398	2 February 2022
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P210047 0255TE21	16 June 2022 7 July 2022

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

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

Reference standards instrument for Acoustic function

- National Institute of Metrology (Thailand)

Reference standards instrument for Electrical function

- Electrical and Electronics Institute; ONSC Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Normal	Specified Sound	Measured value	Deviated value ^[1]	Acceptance limit ^[3]
Frequency (Hz)	Pressure level (dB)	(dB)	(dB)	(dB)
1000	94	94.22	0.22	±0.25

2. Function : Frequency

Normal Sound	Specified Frequency	Measured value	Deviated value ^[2]	Acceptance limit ^[3]
Pressure level (dB)	(Hz)	(Hz)	(%)	(%)
94	1000	1003.0	0.3	±0.7

Certificate No.: CP20210095EA

Calibration Report

3. Function : Total distortion + noise

Normal Sound Pressure level (dB)	Normal Frequency (Hz)	Measured value ^[4] (%)	Acceptance limit ^[5] (%)
94	1000	1.3	2.5

Uncertainty of measurement

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

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

-- End of Report --

**SOUND LEVEL METER CALIBRATION**

Calibration Location: SECOT

Calibration Date: Jul 4, 22

SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
Cirrus	CR:515	94296	94.0	1000

No.	Brand	Model	Serial No.	Effective Calibration Level (dB)	SLM Reading (dB)	Offset (dB)
34	Cirrus	CR162B	G302740	93.7	93.7	-0.1
43	Cirrus	CR162B	G302741	93.7	93.7	-0.2
50	Cirrus	CR162B	G302330	93.7	93.7	-0.2
52	Cirrus	CR162B	G302237	93.7	93.7	0.0

Calibrated by :

Approved by :

**SOUND LEVEL METER CALIBRATION**

Calibration Location:

SECOT

Calibration Date:

Jul 4, 22

SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
Cirrus	CR:515	94296	94.0	1000

No.	Brand	Model	Serial No.	Effective Calibration Level (dB)	SLM Reading (dB)	Offset (dB)
23	Cirrus	CR162B	G302738	93.7	93.7	0.1
39	Cirrus	CR162B	G302743	93.7	93.7	-0.1
41	Cirrus	CR162B	G302737	93.7	93.7	0.2
51	Cirrus	CR162B	G302333	93.7	93.7	0.1

Calibrated by :

Approved by :

**SOUND LEVEL METER CALIBRATION**

Calibration Location:

SECOT

Calibration Date:

Dec 21, 22

SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
Cirrus	CR:515	94296	94.0	1000

No.	Brand	Model	Serial No.	Effective Calibration Level (dB)	SLM Reading (dB)	Offset (dB)
15	Cirrus	CR162B	G300709	94.0	94.0	0.0
21	Cirrus	CR162B	G302740	94.0	94.0	0.0
43	Cirrus	CR162B	G302741	94.0	94.0	0.0
50	Cirrus	CR162B	G302330	94.0	94.0	0.0

Calibrated by :

Approved by :



**ELECTRICAL AND ELECTRONICS INSTITUTE
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Tel: +66 2709 4860-8 Fax: +66 2324 0917-8



Certificate No.: CP20210098EA

Operation No.: CP2021120019

Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: Cirrus Research Plc

Model/Type: CR:515

Serial No.: 94296

ID No.: -

Customer: SECOT Co.,Ltd.

Address: 239 Rimklongprapa Rd., Bangsue,
Bangkok 10800 Thailand

Received Date: 21 December 2021

Calibrated Date: 24 December 2021

Issued Date: 28 December 2021

Calibrated by: Ms. Juntaporn Kunhakom

Approved by: _____

(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

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

Certificate No.: CP20210098EA

Calibration Report

Equipment: Sound Calibrator
 Manufacturer: Cirrus Research Plc
 Model/Type: CR:515
 Serial No.: 94296
 ID No.: -
 Ambient Temperature: (23 ± 2) °C
 Relative Humidity: (50 ± 15) %
 Pressure: (101.3 ± 1.5) kPa
 Method of Calibration :-
 IEC 60942:2017

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1010-21	13 June 2022
2) Waveform Generator	33511B	MY52302264	0144RF21	17 June 2022
3) Audio Analyzing DMM	2015-P	4079144	E1U210398	2 February 2022
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P210047 0255TE21	16 June 2022 7 July 2022

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

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

- Reference standards instrument for Acoustic function
 - National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
 - Electrical and Electronics Institute; ONSC Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Normal	Specified Sound	Measured value	Deviated value ^[1]	Acceptance limit ^[3]
Frequency (Hz)	Pressure level (dB)	(dB)	(dB)	(dB)
1000	94	93.80	-0.20	±0.25

2. Function : Frequency

Normal Sound	Specified Frequency	Measured value	Deviated value ^[2]	Acceptance limit ^[3]
Pressure level (dB)	(Hz)	(Hz)	(%)	(%)
94	1000	1000.3	0.0	±0.7

Certificate No.: CP20210098EA

Calibration Report

3. Function : Total distortion + noise

Norminal Sound Pressure level (dB)	Norminal Frequency (Hz)	Measured value ^[4] (%)	Acceptance limit ^[5] (%)
94	1000	1.4	2.5

Uncertainty of measurement

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

- Note:
- [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.
 - [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.
 - [3] The acceptance limit is for the deviated value.
 - [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
 - [5] The acceptance limit is for the Measured value.

Remarks: 1. Acceptance limit was IEC 60942:2017 Class 1.

- - End of Report - -

Factory Calibration Certificate

Instrument information

Name **WET BULB GLOBE TEMPERATURE (WBGT) METER**
Series No **3522210172**
Type **JT2011-E2A**

Integrity check of instrument

Appearance
Parts integrity
Screen display or touch
Instrument button
Power supply
battery
Data storage and export
Deviation degree of comparison test with
standard instrument

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	30.1	-0.1	0.2
	35.0	35.2	-0.2	0.2
	40.0	39.9	0.1	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	25.2	-0.2	0.2
	30.0	29.9	0.1	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2
GLOBE	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.9	0.1	0.2
	45.0	44.9	0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers , Manufacturer: BGRI, Model: STA, SN: 2-56,
Calibrated Date: 30 March 2021, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000073

Calibration Engineer: 

Date: 2022.3.9

质检专用章

Factory Calibration Certificate

Instrument information

Name	WET BULB GLOBE TEMPERATURE (WBGT) METER
Series No	3522210173
Type	JT2011-E2A

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	44.8	0.2	0.2
DRY	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	45.1	-0.1	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.2	-0.2	0.2
	40.0	40.1	-0.1	0.2
	45.0	44.9	0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN: 2-56,

Calibrated Date: 30 March 2021, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000073

Calibration Engineer: _____

Date: _____



Factory Calibration Certificate

Instrument information

Name	WET BULB GLOBE TEMPERATURE (WBGT) METER
Series No	3522210174
Type	JT2011-E2A

Integrity check of instrument

Appearance	√
Parts integrity	√
Screen display or touch	√
Instrument button	√
Power supply	√
battery	√
Data storage and export	√
Deviation degree of comparison test with standard instrument	√

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.1	-0.1	0.2
	45.0	44.8	0.2	0.2
DRY	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2
GLOBE	25.0	25.2	-0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	45.1	-0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers , Manufacturer: BGRI, Model: STA, SN: 2-56,
Calibrated Date: 30 March 2021, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000073

Calibration Engineer

北京世纪建通科技股份有限公司
质检专用章
Date: 2022.3.9

Factory Calibration Certificate

JANTYTECH
捷通科技

Instrument information

Name **WET BULB GLOBE TEMPERATURE (WBGT) METER**

Series No **3522210180**

Type **JT2011-E2A**

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	45.2	-0.2	0.2
	25.0	24.9	0.1	0.2
DRY	30.0	30.2	-0.2	0.2
	35.0	35.2	-0.2	0.2
	40.0	39.8	0.2	0.2
	45.0	44.8	0.2	0.2
	25.0	24.9	0.1	0.2
GLOBE	30.0	29.9	0.1	0.2
	35.0	34.8	0.2	0.2
	40.0	40.2	-0.2	0.2
	45.0	44.8	0.2	0.2
	25.0	24.9	0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN: 2-56,

Calibrated Date: 30 March 2021, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000073

Calibration Engineer: 

Date: 2022.3.10



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Mechanical Engineering Standards Laboratory Soi 1, Bangpoo Industrial Estate, Muang, Samutprakan 10280, Thailand.

Request No.23-65/0223

MTC.No.23-65/0223-02

Number of page(s) 2

CALIBRATION CERTIFICATE

Nomenclature : DRYCAL

Manufacturer : Mesa Labs

Serial No.: 160100

Model : Defender 520-L

Scale range : 5 ml/min to 500 ml/min

Subdivision : (0.001, 0.01) ml/min

Submitted by : SECOT CO.,LTD.

239, Rimklongprapa Road, Bangsue,
Bangkok 10800, Thailand.

Received date : 26 January 2022

Condition of measured item : Normal

Calibration date : 3 February 2022

Standard :

Standard	Certificate No.	Date due	Traceability
RTD Thermometer	PSL-T 336/63	6-Apr-22	TISTR
Molbox/Pressure Transducer/UpStream	MP-0013-21	25-Jan-23	NIMT
Primary Flow Calibrator S/N 117982	MW-0011-21	8-Apr-23	NIMT

Calibrated by :

Terasak Panna

(Mr.Terasak Panna)

Approved by :

(Ms.Kirana Lijanghirun)

Director
TISTR

Mechanical Engineering Standards Laboratory

Ref. 2013265012600367002

Issued Date 3 February 2022

The results relate only to the items tested/calibrated or value assigned.

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FM.BL.MTC.002 Rev.4

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Fax. (66) 0 2323 9165
E-mail : mtc@tistr.or.th

Office

196 Phahonyothin Road, Chatuchak, Bangkok 10900,
Thailand
Tel. (66) 0 2579 1121-30 ext. 5219, 5225, 5217
Fax. (66) 0 2579 8592
E-mail : sumalee@tistr.or.th



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Mechanical Engineering Standards Laboratory Soi 1, Bangpoo Industrial Estate, Muang, Samutprakan 10280, Thailand.

Request No.23-65/0223

2/2

MTC.No.23-65/0223-02

Calibration point : (20, 50, 100, 200, 400) ml/min

Ambient condition : Temperature (23 ± 3) °C , Relative humidity (55 ± 15) %

Atmospheric pressure (1010 ± 13) hPa

Calibration method : The flowmeter (UUC) was calibrated by comparison method with standard flowmeter according to CP-370.01.

The reported value is the value that converted to value at reference condition within pressure and temperature of the actual gas entering the UUC

Measurement data :

UUC Value (ml/min)	Standard Value (ml/min)	Temperature (°C)	Pressure (hPa)	Deviation (%)	Uncertainty (%)
*22.473	22.553	25.071	1009.97	-0.35	1.08
53.343	53.559	25.077	1009.93	-0.40	1.01
102.11	103.17	25.075	1010.08	-1.02	1.04
199.33	202.02	25.035	1010.16	-1.33	1.06
404.44	411.64	24.950	1010.43	-1.75	1.00

The reported expanded uncertainties are based on standard uncertainties multiplied by a coverage factor $k=2$, which provides a level of confidence of approximately 95%.

* : The calibration point is not the scope of accreditation.

The end of calibration certificate.

TS

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FM.BL.MTC.002 Rev

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Office/Laboratory
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Office
196 Phahonyothin Road, Chatuchak, Bangkok 10900

ภาคผนวก ฉ

หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
จากกรมโรงงานอุตสาหกรรม



ที่ อก ๐๓๑๐(๑)/ ๑๗๔ ๔

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๔ กุมภาพันธ์ ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ซีคอฟ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ตามหนังสือที่อ้างถึง บริษัท ซีคอฟ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๓๔
สถานที่ตั้งเลขที่ ๒๓๔ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ขอเปลี่ยนแปลง
บุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้อยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๔ ราย

- | | |
|--------------------------------------|----------------------------|
| ๑) นางสาวโชติมาส ไทยเจริญ | ทะเบียนเลขที่ ว-๒๓๔-จ-๖๐๐๖ |
| ๒) นางสาวณัฐศิริ เลิศธีรพัฒน์ | ทะเบียนเลขที่ ว-๒๓๔-จ-๖๔๒๓ |
| ๓) นางสาวเกษวรินทร์ ศิลศึก | ทะเบียนเลขที่ ว-๒๓๔-จ-๖๔๒๔ |
| ๔) นางสาวจิรนนท์ จิตุชะศรี ปิยะธนากร | ทะเบียนเลขที่ ว-๒๓๔-จ-๗๒๓๒ |

๒. ให้เพิ่มผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ราย

- | | |
|----------------------------|----------------------------|
| นางสาวณัฐศิริ เลิศธีรพัฒน์ | ทะเบียนเลขที่ ว-๒๓๔-ค-๐๐๐๑ |
|----------------------------|----------------------------|

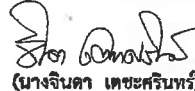
๓. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒ ราย

- | | |
|-------------------------------------|----------------------------|
| ๑) นางสาวสุดาพร สุนทร | ทะเบียนเลขที่ ว-๒๓๔-จ-๐๐๐๑ |
| ๒) นางสาวสัญญาลักษณ์ อินทรประสิทธิ์ | ทะเบียนเลขที่ ว-๒๓๔-จ-๐๐๐๒ |

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ที่ อก ๐๓๑๐(๑)/๑๑๘๐๔ ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓ คือในวันที่ ๒ พฤษภาคม ๒๕๖๖ ทั้งนี้ สามารถยื่นคำ
ขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ท้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นางจินดา เดชะศรีพันธุ์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติการตามพันธกิจกรมโรงงานอุตสาหกรรม



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๔

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๑๐(๑)/ ๑๑ ๘ ๐ ๔

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๒๑ ตุลาคม ๒๕๖๓

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอฟ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ มีนาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ซีคอฟ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ว-๒๓๔ สถานที่ตั้งเลขที่ ๒๓๔ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ
กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอฟ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย ตามสิ่งที่ส่งมาด้วย ๑

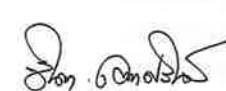
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๑ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนไว้วิเคราะห์ในน้ำเสีย จำนวน ๔๖ รายการ น้ำใต้ดิน
จำนวน ๑๒๓ รายการ อากาศเสีย จำนวน ๒๗ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๔ รายการ
และดิน จำนวน ๑๒๒ รายการ รวมทั้งสิ้นจำนวน ๓๕๒ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นางจินดา เดชะศรีพันธุ์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติการตามพันธกิจกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๐๐๒ ๐ ๒๒๐๒ ๔๑๔๖

โทรสาร ๐ ๒๒๕๔ ๓๒๐๘ ๐ ๒๒๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคोट จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๘ ๐ ๕

ลงวันที่ ๒๑

ตุลาคม ๒๕๖๓

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย

๑) นางสาวฤดี เกรียงไกรอุดม	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๘๒๐
๒) นางสาวอารยา ทิพรักษ์	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๘๖๓
๓) นายขรรชัย เกรียงไกรอุดม	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๗๕
๔) นางสาวเชมชุตตา อินทร์สร	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๗๖
๕) นางสาวปริดา สมใจ	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๗๘
๖) นางสาวอริญญา มาตา	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๗๙
๗) นางสาวลดาวัลย์ วงศ์เจริญ	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๘๐
๘) นางสาวมณีนววรรณ เกตะวันดี	ทะเบียนเลขที่	ว-๒๓๙-ค-๕๙๘๒
๙) นางสาวนริสา ภูวสรระพีชญ์	ทะเบียนเลขที่	ว-๒๓๙-ค-๖๔๑๙
๑๐) นางสาวศิริวรรณ ฉิมสง่า	ทะเบียนเลขที่	ว-๒๓๙-ค-๖๔๒๐

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคोट จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๘ ๐ ๕

ลงวันที่ ๒๑

ตุลาคม ๒๕๖๓

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๑ ราย

๑) นางสาวสุรัชต์ ชัยธรรม	ทะเบียนเลขที่	ว-๒๓๙-จ-๕๕๒๕
๒) นางสาวสุธาทิพย์ เทียนเตี้ย	ทะเบียนเลขที่	ว-๒๓๙-จ-๕๕๒๙
๓) นางสาวสุนันทา ศิริวัฒนานนท์	ทะเบียนเลขที่	ว-๒๓๙-จ-๕๕๘๓
๔) นายบวร ดีชัยยะ	ทะเบียนเลขที่	ว-๒๓๙-จ-๕๕๘๖
๕) นางสาวเกศรินทร์ วรเดโชวิทยา	ทะเบียนเลขที่	ว-๒๓๙-จ-๕๕๙๑
๖) นายอนิวัฒน์ พิมวันนา	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๐๐๑
๗) นายชิตพล สมประสงค์	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๐๐๒
๘) นางสาวศศิธร พรหมประเสริฐ	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๐๐๓
๙) นายศิวนนท์ กุลวงษ์	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๐๐๕
๑๐) นางสาวโชติมาส ไทยเจริญ	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๐๐๖
๑๑) นางสาวปิยขวัญ สุระโคตร	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๔๒๑
๑๒) นางสาวณัฐศิริ เลิศธีรพัฒน์	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๔๒๓
๑๓) นางสาวเกษรรินทร์ ศิลศึก	ทะเบียนเลขที่	ว-๒๓๙-จ-๖๔๒๔
๑๔) นางสาวอลิษา คณิรานนท์	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๑
๑๕) นางสาวจิรนนท์ จิตุทธศรี ปิยะธนากร	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๒
๑๖) นางสาวสิริวรรณ แก้วชิงดวง	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๓
๑๗) นางสาวปัทมวรรณ สุวรรณวิโรจน์	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๔
๑๘) นางสาวกนิษฐา เจริญเชื้อ	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๖
๑๙) นายจิรากร ลิมศิลา	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๗
๒๐) นายชนาธิป สิงห์เกษมศักดิ์	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๓๘
๒๑) นายวัชรกานต์ ประมาคะเต	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๔๐
๒๒) นายชอง เฮงขวัญกุล	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๒๔๒
๒๓) นางสาวกฤษณา จันทุม	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๘๐๒
๒๔) นางสาวพรนภา บุตรธรรม	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๘๐๓
๒๕) นางสาวธาริณี อากปลิว	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๘๐๔
๒๖) นายธนโชติ ช่างลื้อ	ทะเบียนเลขที่	ว-๒๓๙-จ-๗๘๐๖
๒๗) นางสาวพัชรา สมานฉันท	ทะเบียนเลขที่	ว-๒๓๙-จ-๘๑๘๓
๒๘) นางสาวจุฑารัตน์ แจ่มเรือน	ทะเบียนเลขที่	ว-๒๓๙-จ-๘๔๔๓
๒๙) นางสาวจณิสตา กุ้ยอ่อน	ทะเบียนเลขที่	ว-๒๓๙-จ-๘๔๔๗
๓๐) นางสาววรัญญา เขียนมัน	ทะเบียนเลขที่	ว-๒๓๙-จ-๘๔๔๘
๓๑) นางสาวจิรารัตน์ นุริตมนต์	ทะเบียนเลขที่	ว-๒๓๙-จ-๘๔๔๙

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอฟ จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๘ ๐ ๔

ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๕๒ รายการ

น้ำเสีย จำนวน 46 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
2	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
6	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
7	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]



(นางริกาญจน์ จัตรสกุลไชย)

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และทะเบียนห้องปฏิบัติการ

10 Chemical...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chemical Oxygen Demand	1) Open Reflux, Titrimetric method ^[4] 2) Close Reflux, Colorimetric method ^[4] 3) Closed Reflux, Titrimetric Method ^[4]
11	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[4]
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
15	Cyanide	Distillation, Colorimetric method ^[4]
16	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
17	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
18	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
19	4,4'-DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
20	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]



(นางริกาญจน์ จัตรสกุลไชย)

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21 Endosulfan I...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
22	Endosulfan II	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	Endosulfan Sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
24	Endrin	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	Endrin Aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
26	Formaldehyde	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
27	Free Chlorine	Distillation, Colorimetric Method ^[3]
28	Heptachlor	1) Iodometric Method ^[4]
29	Heptachlor epoxide	2) DPD Colorimetric Method ^[4]
30	Hexavalent Chromium	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
31	Lead	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
		1) Digestion, Direct Air-Acetylene Flame Method ^[4]
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4]
		3) Digestion, Inductively Coupled Plasma Method ^[4]

วิทย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

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32 Manganese...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ^[4]
33	Mercury	2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4]
34	Methoxychlor	3) Digestion, Inductively Coupled Plasma Method ^[4]
35	Nickel	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
36	Oil & Grease	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
37	pH	1) Digestion, Direct Air-Acetylene Flame Method ^[4]
38	Phenols	2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4]
39	Selenium	3) Digestion, Inductively Coupled Plasma Method ^[4]
40	Sulfide	1) Liquid-Liquid, Partition-Gravimetric Method ^[4]
41	Temperature	2) Soxhlet Extraction Method ^[4]
42	Total Dissolved Solids	Electrometric Method ^[4]
43	Total Kjeldahl Nitrogen	1) Distillation, Chloroform Extraction Method ^[4]
44	Total Suspended Solids	2) Distillation, Direct Photometric Method ^[4]
45	Trivalent Chromium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4]
		2) Digestion, Inductively Coupled Plasma Method ^[4]
		1) Iodometric method ^[4]
		2) Methylene blue method ^[4]
		Laboratory and Field Methods ^[4]
		Dried at 180 °C ^[4]
		1) Macro Kjeldahl Method ^[4]
		2) Semi-Micro Kjeldahl Method ^[4]
		Dried at 103-105 °C ^[4]
		1) Digestion, Direct Air-Acetylene Flame Method;
		Colorimetric Method; Calculation ^[4]
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ^[4]
		3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4]
46	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ^[4]
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4]
		3) Digestion, Inductively Coupled Plasma Method ^[4]

วิทย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

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น้ำใต้ดิน...

น้ำได้ดิน จำนวน 123 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Acetone	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method ^[4]
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
5	Antimony	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
8	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
10	Benzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

16 Beryllium...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
16	Beryllium	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
20	Bromoform	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
21	Butanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	Carbon disulfide	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
29	Chlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass spectrometric Method ^[4]
31	Chloroform	Purge and Trap Gas Chromatographic/Mass spectrometric Method ^[4]

วิมล

32 2-Chlorophenol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method; Colorimetric Method; Calculation ^[4]
35	Chromium (VI)	1) Colorimetric Method ^[4] 2) Extraction, Air-Acetylene Flame Method ^[4]
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
37	Cyanide	1) Distillation, Titrimetric Method ^[4] 2) Distillation, Colorimetric Method ^[4]
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]



42 Dibenz(a,h)...

(นางริภาญจน์ จิตตรสกุลวิไล)
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และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]



59 2,4-Dimethylphenol...

(นางริภาญจน์ จิตตรสกุลวิไล)
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และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
65	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
66	Ethylbenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
72	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

73 n-Hexane...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
73	n-Hexane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
76	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
84	Methanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]

วิมล

85 Methoxychlor...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
86	Methyl bromide	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
87	Methylene chloride	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
95	Polychlorinated Biphenyls - PCB-1016 - PCB-1221 - PCB-1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
96	Pentachlorophenol	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]


 (นางริกาญจน์ จิตพรกุลวิไล)
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 และทะเบียนห้องปฏิบัติการ

97 pH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	pH	Electrometric method ^[4]
98	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
99	Phenol	1) Distillation, Chloroform Extraction Method ^[4] 2) Distillation, Direct Photometric Method ^[4] 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
102	Silver	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
103	Styrene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
104	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
105	Tetrachloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
106	Toluene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
107	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass spectrometric Method ^[7,9]
108	TPH (C ₈ -C ₁₆)	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[6,8] 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method ^[6,9]
109	TPH (C ₁₆ -C ₃₅)	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[6,8] 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method ^[6,9]
110	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
111	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]


 (นางริกาญจน์ จิตพรกุลวิไล)
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112 1,1,2-Trichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
112	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
113	Trichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
114	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
115	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
116	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
117	Vanadium	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
118	Vinyl chloride	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
119	m-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
120	o-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
121	p-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
122	Xylene (Total)	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
123	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]

อากาศเสีย (ปล่อยระบาย) จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]



(นางริกาญจน์ จิตรสกุลไฉ)

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และทะเบียนห้องปฏิบัติการ

2 Arsenic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
5	Carbon monoxide	Instrumental Analyzer Method ^[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
10	Cresol	Adsorption Sampling, Gas Chromatographic Method ^[5]
11	Dioxin/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]



(นางริกาญจน์ จิตรสกุลไฉ)

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14 Hydrogen Sulfide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5]
18	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
19	Opacity	Ringelmann's Method ^[2]
20	Oxide of Nitrogen	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Absorption Sampling, Phenoldisulfonic acid Method ^[5] 3) Instrumental Analyzer Method ^[5]
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[5]
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
25	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]

26 Vanadium...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method ^[5] 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method ^[5]

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 34 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14]

3) Digestion...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,15,17] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,16,17]



(นางริกาญจน์ จิตตรสกุลไธ)

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และทะเบียนห้องปฏิบัติการ

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,14,17] 1) Waste Extraction, Colorimetric Method ^[1,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,24] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[24]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26]



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และทะเบียนห้องปฏิบัติการ

3) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
16	DDT	3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet...

วิธีวิเคราะห์

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
20	Lead	4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26] 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,18] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[19] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,26] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]

วิธีวิเคราะห์

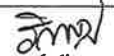
(นางริกาญจน์ ฉัตรสกุลวิไล)

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และคณะเจ้าหน้าที่ปฏิบัติการ

25 Nickel...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,23] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,23]
27	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,24] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[24]
28	pH	Electrometric Method ^[30,31]
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,20] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,20] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
32	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[1,12,25] 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[12,25]


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33 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
34	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]

ดิน จำนวน 122 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,25]
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
5	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method ^[11,22]
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]

9 Benz(a)anthracene...


 (นางริกาญจน์ จิตรสกุลไธโล)
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 และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
16	Beryllium	Digestion, Inductively Coupled Plasma Method ^[7,14]
17	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
22	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]

27 Chlordane...

(นางริกาญจน์ อัครสกุลวิไล)
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และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
32	2-Chlorophenol	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation Method ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation Method ^[7,8,14,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
37	Cyanide	1) Extraction, Distillation, Titrimetric Method ^[27,28,29] 2) Extraction, Distillation, Colorimetric Method ^[27,28,29]
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[24]
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]

41 DDT...

(นางริกาญจน์ อัครสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
42	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
43	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
47	3,3'-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]



(นางริกาญจน์ จิตรสกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
58	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
61	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
62	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
63	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
67	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
68	Fluorene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]



(นางริกาญจน์ จิตรสกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

70 Heptachlor epoxide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
71	Hexachlorobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
72	Hexachloro-1,3-butadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,25]
74	α -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
75	β -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
76	γ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
77	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
78	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
79	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
80	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]



(นางริกาญจน์ จิตตรกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และนายวิชาญ ชื่นวงษ์ วิศวกร

83 Mercury...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[19] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
84	Methanol	Ultrasonic Extraction, Direct Aqueous Injection, Gas Chromatographic Method ^[11,21]
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,25]
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,25]
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,26]
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,25]
91	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
93	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
94	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,26]
95	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	Soxhlet Extraction, Gas Chromatographic Method ^[10,23]



(นางริกาญจน์ จิตตรกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และนายวิชาญ ชื่นวงษ์ วิศวกร

96 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[24]
97	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
98	Phenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
99	Pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
100	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,20] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
101	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
102	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
103	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
104	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
105	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
106	TPH (C ₅ -C ₉)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
107	TPH (C ₈ -C ₁₆)	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,21] 2) Soxhlet Extraction, Gas Chromatographic/ Mass spectrometric Method ^[10,21]
108	TPH (C ₁₆ -C ₃₅)	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,21] 2) Soxhlet Extraction, Gas Chromatographic/ Mass spectrometric Method ^[10,25]
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]

111 1,1,2-Trichloroethane...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
112	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
113	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
114	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
116	Vanadium	Digestion, Inductively Coupled Plasma Method ^[7,14]
117	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
118	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
119	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
120	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
121	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,25]
122	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]

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(นางริกาญจน์ ฉัตรสกุลวิไล)

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ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

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(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ภาคผนวก ข

ใบรับรองความสามารถห้องปฏิบัติการและขอบข่ายการรับรอง
ห้องปฏิบัติการทดสอบ ตามมาตรฐาน ISO/IEC 17025
จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)



ใบรับรองเลขที่ 20T173/1151

ใบรับรองห้องปฏิบัติการ

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑

เลขานุการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

ออกใบรับรองฉบับนี้ให้

บริษัท ซีคอฟ จำกัด

มีห้องปฏิบัติการตั้งอยู่เลขที่

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

ได้รับการรับรองความสามารถห้องปฏิบัติการทดสอบ

ตามมาตรฐานเลขที่ มอก. 17025-2561 (ISO/IEC 17025 : 2017)

ข้อกำหนดทั่วไปว่าด้วยความสามารถห้องปฏิบัติการทดสอบและสอบเทียบ

หมายเลขการรับรองที่ ทดสอบ ๐๓๙๔

โดยมีสาขาการรับรองตามรายละเอียดแนบท้ายใบรับรอง

ตั้งแต่วันที่ ๙ กันยายน พ.ศ. ๒๕๖๓

ถึง วันที่ ๘ กันยายน พ.ศ. ๒๕๖๖

ออกให้ ณ วันที่ ๒๓ กันยายน ๒๕๖๓

(นายวีระกิตติ์ รันทกิจธนวิชัย)

รองเลขาธิการ ปฏิบัติราชการแทน

เลขานุการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ

ใบรับรองเลขที่ 20T173/1151

ชื่อห้องปฏิบัติการ

ที่อยู่

หมายเลขการรับรองที่

สถานภาพห้องปฏิบัติการ

ห้องปฏิบัติการทดสอบ บริษัท ซีคอฟ จำกัด

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

ทดสอบ 0394

☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาสิ่งแวดล้อม 1. น้ำและน้ำเสีย (water and wastewater)	- Arsenic 0.000 5 mg/l to 0.090 0 mg/l - Arsenic 0.05 mg/l to 4.50 mg/l - Barium 0.02 mg/l to 4.50 mg/l - Cadmium 0.01 mg/l to 4.50 mg/l - Chromium 0.01 mg/l to 4.50 mg/l - Copper 0.02 mg/l to 4.50 mg/l - Iron 0.05 mg/l to 9.00 mg/l - Lead 0.03 mg/l to 4.50 mg/l - Manganese 0.01 mg/l to 9.00 mg/l - Nickel 0.01 mg/l to 4.50 mg/l - Zinc 0.02 mg/l to 9.00 mg/l	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23 rd edition, 2017, Part 3030 F and Part 3114 C - Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23 rd edition, 2017, Part 3030 E and Part 3120 B

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563

หน้า 1/5

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ

ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394

สถานภาพห้องปฏิบัติการ ☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาล้างแวล้อม		
1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)	- COD 100 mg/l to 4 000 mg/l	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23 rd edition, 2017, Part 5220 D
2. คุณภาพอากาศ (air quality)		
2.1 บริเวณทำงาน (workplace)	- Total dust 0.10 mg/filter to 2.00 mg/filter	- NIOSH Manual of Analytical Methods (NMAM), method 0500, 4 th edition, 15 th August 1994 (Exclude Sampling)
	- Respirable dust 0.10 mg/filter to 2.00 mg/filter	- NIOSH Manual of Analytical Method(NMAM), method 0600, 4 th edition, 15 th January 1998 (Exclude Sampling)
	- Benzene 1.10 µg/tube to 420 µg/tube	- NIOSH Manual of Analytical Methods (NMAM), method 1501, 4 th edition, 15 th March 2003 (Exclude Sampling)
	- Toluene 1.10 µg/tube to 420 µg/tube	
	- Total xylenes 2.20 µg/tube to 840 µg/tube	
	• m,p-xylene 1.10 µg/tube to 420 µg/tube	
	• o-xylene 1.10 µg/tube to 420 µg/tube	

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563 หน้า 2/5

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สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาส่งแวดล้อม		
2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)		
2.2 อากาศในปล่องระบาย อากาศ (stack)	- Sulfur dioxide 1.00 mg/l to 16 000 mg/l (solution)	- US.EPA , Code of Federal Regulations, 40 CFR 60 appendix A, Method 6, July 2019 (Exclude Sampling)
	- Hydrogen fluoride 5 µg/sample to 400 µg/sample	- In-house method : WI-7.2-1-22 based on US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A Method 26, 2019 (Exclude Sampling)
	- Hydrogen chloride 5 µg/sample to 400 µg/sample	
2.3 บรรยากาศทั่วไป (ambient air)	- Volatile organic compounds (VOCs)	- In-house method : WI-7.2-1-24 based on US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)
	• Chloroethene 0.05 µg/m ³ to 51.00 µg/m ³	
	• 1,3 - butadiene 0.04 µg/m ³ to 44.00 µg/m ³	
	• Bromomethane 0.08 µg/m ³ to 77.00 µg/m ³	
	• Acrolein 0.05 µg/m ³ to 45.00 µg/m ³	
	• Acrylonitrile 0.04 µg/m ³ to 43.00 µg/m ³	
	• Dichloromethane 0.14 µg/m ³ to 69.00 µg/m ³	
	• Carbon disulfide 0.06 µg/m ³ to 62.00 µg/m ³	
	• Trichloromethane 0.20 µg/m ³ to 97.00 µg/m ³	

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563 หน้า 3/5

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ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394
สถานภาพห้องปฏิบัติการ ☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
<p>สาขาสิ่งแวดล้อม</p> <p>2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)</p> <p>2.3 บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- Volatile organic compounds (VOCs) (cont.)</p> <ul style="list-style-type: none"> 1,2 - dichloroethane 0.08 $\mu\text{g}/\text{m}^3$ to 80.00 $\mu\text{g}/\text{m}^3$ Benzene 0.06 $\mu\text{g}/\text{m}^3$ to 63.00 $\mu\text{g}/\text{m}^3$ Carbon tetrachloride 0.25 $\mu\text{g}/\text{m}^3$ to 125 $\mu\text{g}/\text{m}^3$ Trichloroethylene 0.21 $\mu\text{g}/\text{m}^3$ to 107 $\mu\text{g}/\text{m}^3$ 1,2 - dichloropropane 0.18 $\mu\text{g}/\text{m}^3$ to 92.00 $\mu\text{g}/\text{m}^3$ Tetrachloroethylene 0.27 $\mu\text{g}/\text{m}^3$ to 135 $\mu\text{g}/\text{m}^3$ 1,2 - dibromoethane 0.31 $\mu\text{g}/\text{m}^3$ to 153 $\mu\text{g}/\text{m}^3$ 1,1,2,2 - tetrachloroethane 0.69 $\mu\text{g}/\text{m}^3$ to 137 $\mu\text{g}/\text{m}^3$ 	<p>- In-house method :WI-7.2-1-24 US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)</p>

ฉบับที่ 1 ตั้งแต่ วันที่ 9 กันยายน 2563 หน้า 4/5
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ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394
สถานภาพห้องปฏิบัติการ ☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
<p>สาขาสิ่งแวดล้อม</p> <p>2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)</p> <p>2.3 บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- Volatile organic compounds (VOCs) (cont.)</p> <ul style="list-style-type: none"> Benzyl chloride 0.52 $\mu\text{g}/\text{m}^3$ to 103 $\mu\text{g}/\text{m}^3$ 1,4 - dichlorobenzene 0.24 $\mu\text{g}/\text{m}^3$ to 120 $\mu\text{g}/\text{m}^3$ 	<p>- In-house method :WI-7.2-1-24 US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)</p>

ออกให้ ณ วันที่ ๑3 กันยายน ๒๕๖๓



(นายวีระกิตติ์ รื่นกิจธนวิชัย)
รองเลขาธิการ ปฏิบัติราชการแทน
เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

ฉบับที่ 1 ตั้งแต่ วันที่ 9 กันยายน 2563 หน้า 5/5
กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม