

ภาคผนวก ก-13

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เอกสารการตรวจสอบความพร้อมของอุปกรณ์ป้องกันอัคคีภัย



บริษัท บ้านไร่ผลิตไฟฟ้า จำกัด

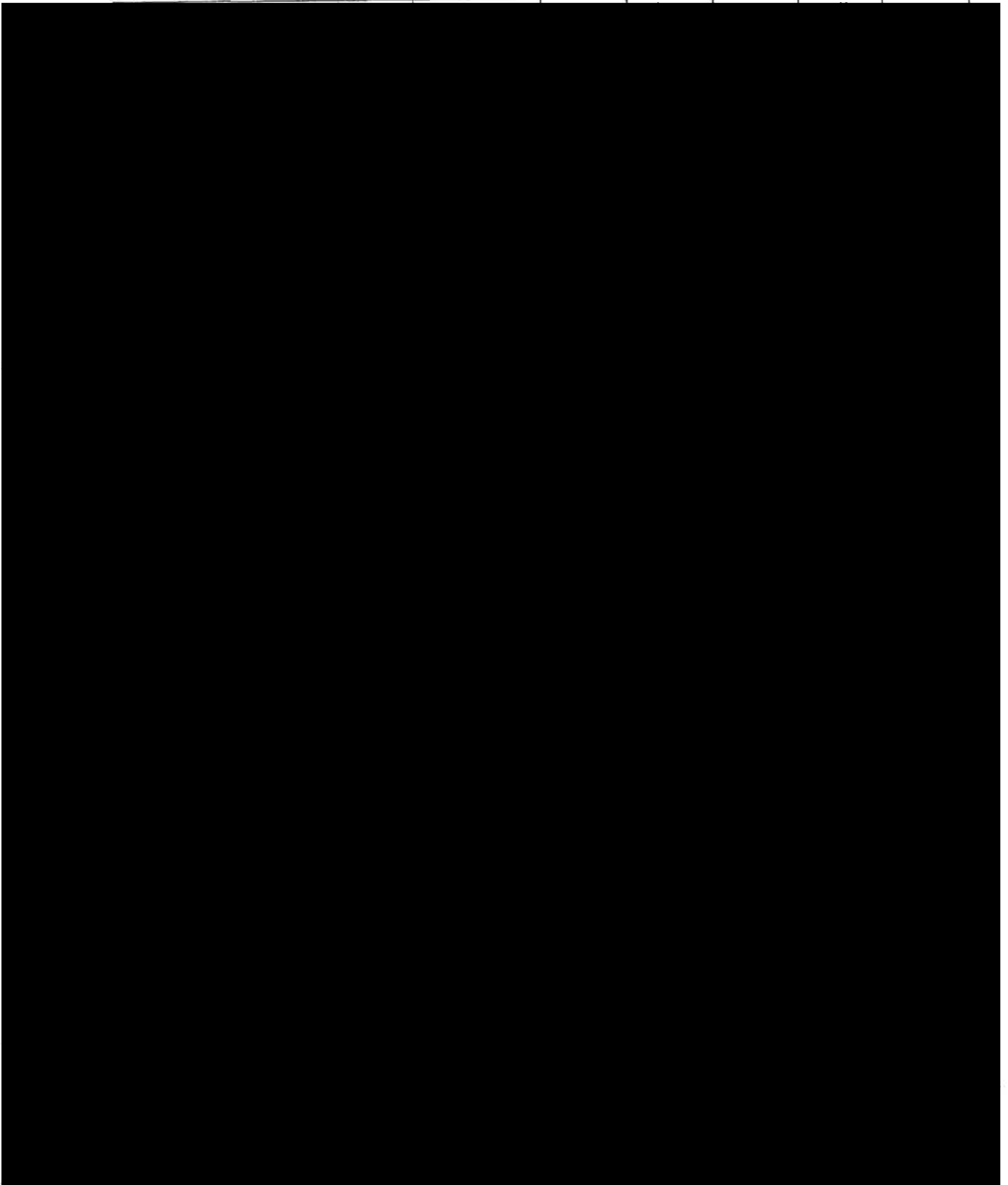
แบบตรวจถังดับเพลิง ( FIRE EXTINGUISHER CHECKLIST)

FM-SE01-02

ฉบับที่ : 2

วันที่ตรวจ : 6 มิ.ย. - 11 มิ.ย. 65

สถานที่ :





บริษัท บ้านไร่ผลิตไฟฟ้า จำกัด

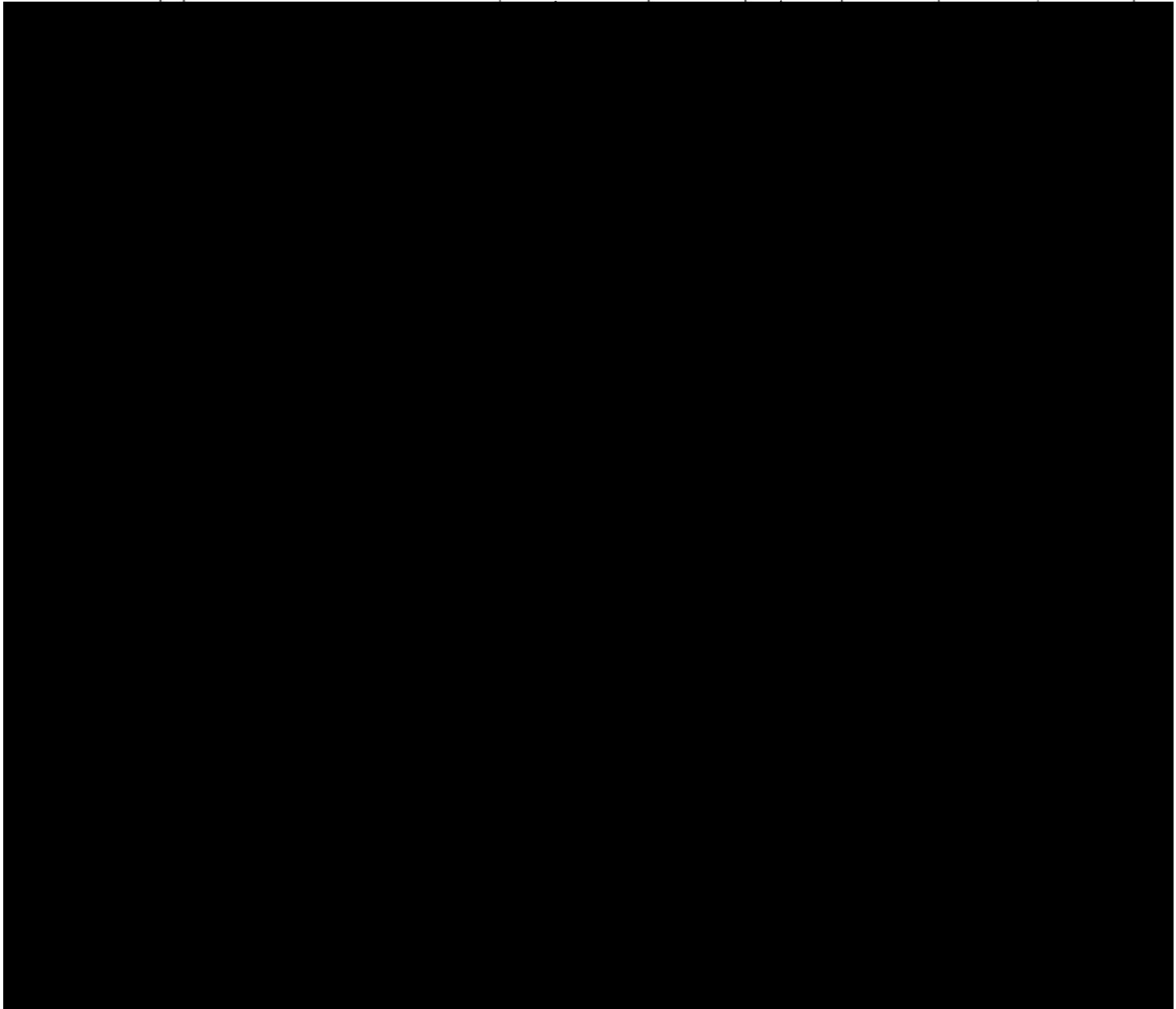
แบบตรวจดับเพลิง ( FIRE EXTINGUISHER CHECKLIST )

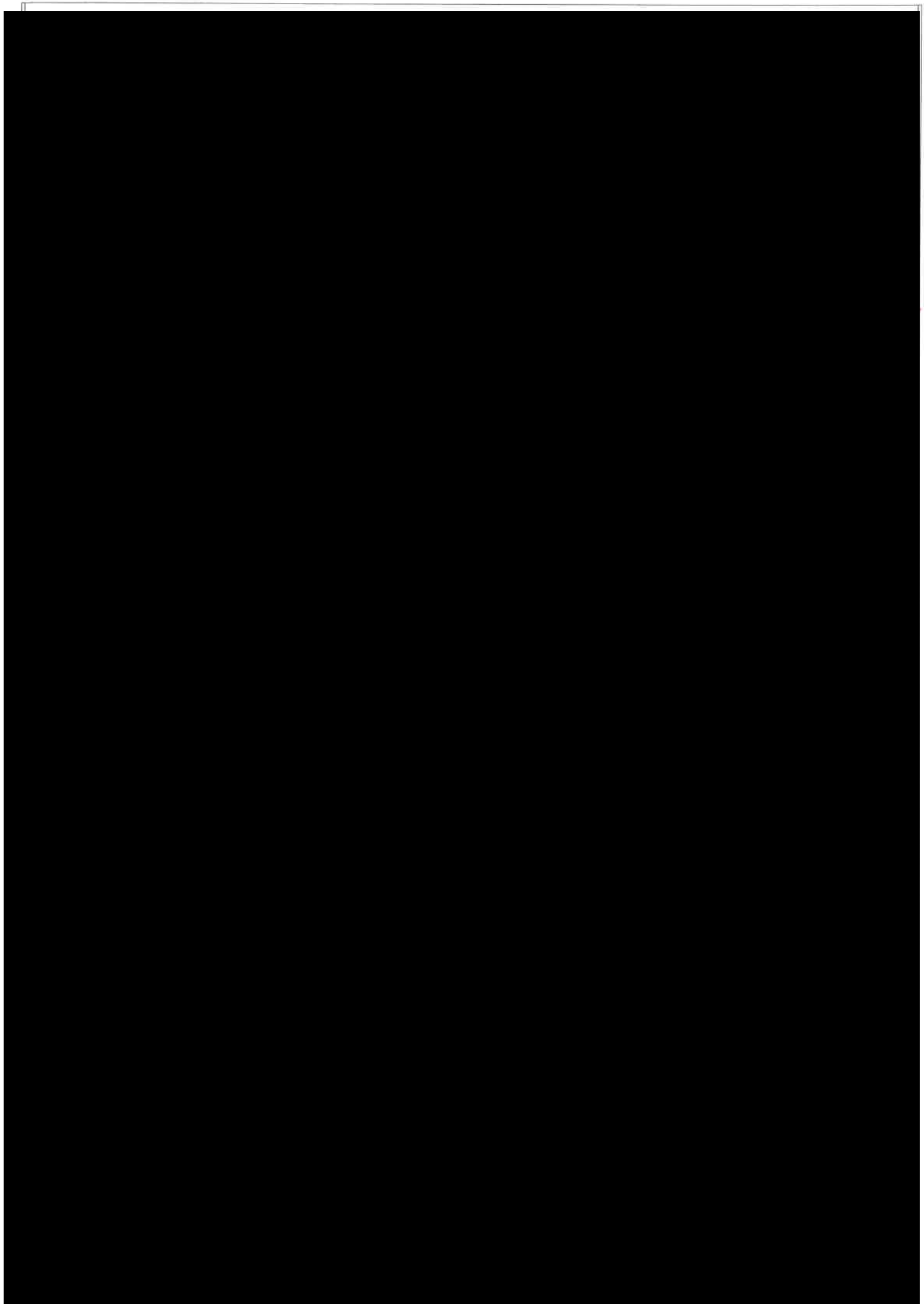
FM-SE01-02

ฉบับที่ : 2

วันที่ตรวจ :

สถานที่ :



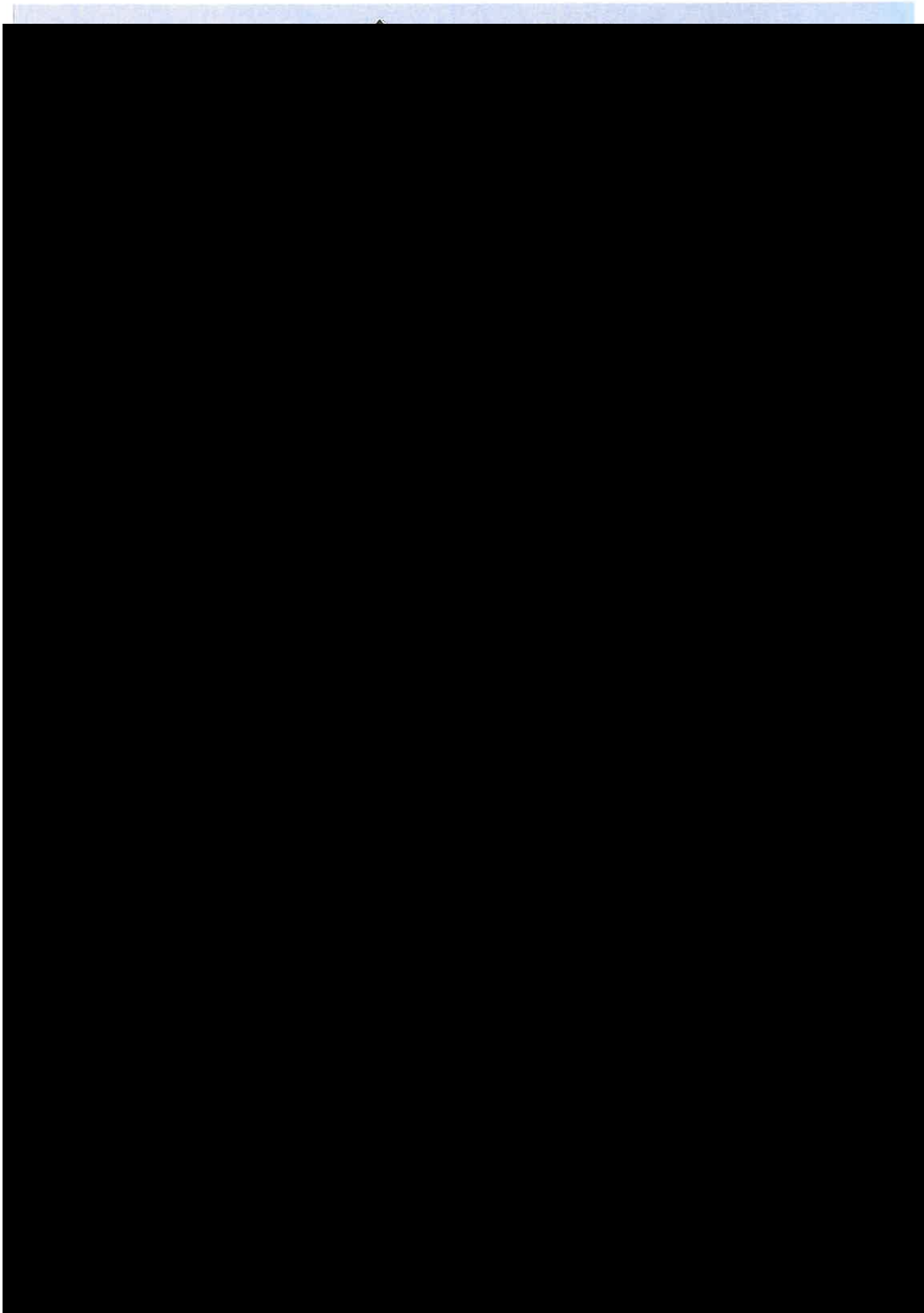




ภาคผนวก ก-14

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หนังสือนำเสนอรายงานผลการปฏิบัติตามมาตรการป้องกัน และแก้ไขผลกระทบ  
สิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม  
ครั้งที่ 2/2564



ภาคผนวก ข-1

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รายงานผลการตรวจวัด

## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**SAMPLING SOURCE** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**SAMPLE TYPE** : STACK  
**RECEIVED DATE** : FEBRUARY 28, 2022  
**SAMPLING DATE** : FEBRUARY 25, 2022  
**ANALYTICAL DATE** : FEBRUARY 28-MARCH 4, 2022  
**SAMPLING TIME** : 11:30-12:12 HOUR  
**REPORT NO.** : 2022-U016916  
**SAMPLING BY** : MR RONNAPOB PUTRAGULPATTANA ๖-145-๑-0049  
**WORK NO.** : 2022-000024  
**ANALYZED BY** : MISS SUWAN KONGTHONG ๖-145-๑-0025  
**ANALYSIS NO.** : T22AD634-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	
			กรณีเดินเครื่องที่เต็มกำลังการผลิตสูงสุด (FULL LOAD) ในสภาวะปกติ (NORMAL OPERATION) (BOILER NO.9) T22AD634-0001	
			ACTUAL OXYGEN	7% OXYGEN
TOTAL SUSPENDED PARTICULATE	mg/m <sup>3</sup>	ISOKINETIC, GRAVIMETRIC METHOD (US EPA METHOD 5)	17.7	33.3
SAMPLE CONDITION			COMPLETE	

### REMARK

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

(MISS BUDSAKORN LERDPANUMAS)  
LABORATORY SUPERVISOR  
๖-145-๑-0011  
JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING SOURCE** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**MEASURING TYPE** : STACK  
**RECEIVED DATE** : FEBRUARY 25, 2022  
**MEASURING DATE** : FEBRUARY 25, 2022  
**ANALYTICAL DATE** : FEBRUARY 25, 2022  
**MEASURING TIME** : 11:40-11:50 HOUR  
**REPORT NO.** : 2022-U016917  
**MEASURING METHOD** : U.S. EPA METHOD 6C, 7E, 10  
**WORK NO.** : 2022-000024  
**MEASURED BY** : MR RONNAPOB PUTRAGULPATTANA ๖-145-๖-0049  
**ANALYSIS NO.** : T22AD634-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	
			กรณีเดินเครื่องที่เต็มกำลังการผลิตสูงสุด (FULL LOAD) ในสภาวะปกติ (NORMAL OPERATION) (BOILER NO.9) T22AD634-0001	
			ACTUAL OXYGEN	7% OXYGEN
SULPHUR DIOXIDE	ppm	PORTABLE ANALYZER, ELECTROCHEMICAL METHOD AT SITE (US EPA METHOD 6C)	< 1	< 1
OXIDES OF NITROGEN AS NITROGEN DIOXIDE	ppm	PORTABLE ANALYZER, ELECTROCHEMICAL METHOD AT SITE (US EPA METHOD 7E)	89	168
CARBON MONOXIDE	ppm	PORTABLE ANALYZER, ELECTROCHEMICAL METHOD AT SITE (US EPA METHOD 10)	3	6
SAMPLE CONDITION			COMPLETE	

**REMARK**

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

(MR NATTAWAT DANGSAWAT)  
LABORATORY SUPERVISOR  
๖-145-๖-0021  
JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING SOURCE** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**MEASURING TYPE** : STACK **RECEIVED DATE** : FEBRUARY 25, 2022  
**MEASURING DATE** : FEBRUARY 25, 2022 **ANALYTICAL DATE** : FEBRUARY 25, 2022  
**MEASURING TIME** : 11:340-11:55 HOUR **REPORT NO.** : 2022-U016918  
**MEASURING METHOD** : RINGELMANN'S METHOD **WORK NO.** : 2022-000024  
**MEASURED BY** : MR RONNAPOB PUTRAGULPATTANA ๖-145-๖-0049 **ANALYSIS NO.** : T22AD634-0001  
MR AKAWUT SANOEJAI ๖-145-๖-0054

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT
			กรณีเดินเครื่องที่เต็มกำลังการผลิตสูงสุด (FULL LOAD) ในสภาวะปกติ (NORMAL OPERATION) (BOILER NO.9) T22AD634-0001
OPACITY	%	RINGELMANN 'S METHOD	5

(MR NATTAWAT DANGSAWAT)  
LABORATORY SUPERVISOR  
๖-145-๓-0021  
JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**SAMPLING SOURCE** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**SAMPLE TYPE** : STACK  
**RECEIVED DATE** : FEBRUARY 28, 2022  
**SAMPLING DATE** : FEBRUARY 25, 2022  
**ANALYTICAL DATE** : FEBRUARY 28-MARCH 4, 2022  
**SAMPLING TIME** : 12:30-13:06 HOUR  
**REPORT NO.** : 2022-U016919  
**SAMPLING BY** : MR RONNAPOB PUTRAGULPATTANA ๖-145-๖-0049  
**WORK NO.** : 2022-000024  
**ANALYZED BY** : MISS SUWAN KONGTHONG ๖-145-๓-0025  
**ANALYSIS NO.** : T22AD634-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	
			ปล่องกรณีพ่นเขม่า (SOOT BLOW) (BOILER NO.9) T22AD634-0002	
			ACTUAL OXYGEN	7% OXYGEN
TOTAL SUSPENDED PARTICULATE	mg/m <sup>3</sup>	ISOKINETIC, GRAVIMETRIC METHOD (US EPA METHOD 5)	21.4	40.2
<b>SAMPLE CONDITION</b>			COMPLETE	

REMARK

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

*Budsakorn ✓*

(MISS BUDSAKORN LERDPANUMAS)  
LABORATORY SUPERVISOR  
๖-145-๓-0011  
JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING SOURCE** : บ้านคิลาทอง  
**MEASURING TYPE** : AMBIENT (NOISE)  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \*  
**MEASURING METHOD** : INTEGRATED SOUND LEVEL METER  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET

**RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**REPORT NO.** : 2022-U020008  
**WORK NO.** : 2022-000024  
**ANALYSIS NO.** : T22AE131-0001 - T22AE131-0003

TIME*	RESULT dB(A)		
	บ้านคิลาทอง		
	FEBRUARY 27-28, 2022		
	T22AE131-0001		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	46.0	66.8	42.0
08:00-09:00 HOUR	44.2	67.9	40.3
09:00-10:00 HOUR	41.2	59.7	37.5
10:00-11:00 HOUR	41.1	57.5	37.0
11:00-12:00 HOUR	41.5	58.4	37.6
12:00-13:00 HOUR	41.4	62.3	37.5
13:00-14:00 HOUR	41.2	55.3	38.0
14:00-15:00 HOUR	41.1	66.2	37.5
15:00-16:00 HOUR	42.0	65.9	37.6
16:00-17:00 HOUR	42.0	59.4	37.9
17:00-18:00 HOUR	48.1	67.6	39.0
18:00-19:00 HOUR	44.3	65.7	39.5
19:00-20:00 HOUR	45.9	68.6	41.9
20:00-21:00 HOUR	46.6	65.4	44.6
21:00-22:00 HOUR	43.1	64.3	40.0
22:00-23:00 HOUR	41.9	58.7	39.4
23:00-00:00 HOUR	42.6	55.1	40.1
00:00-01:00 HOUR	41.6	53.8	39.7
01:00-02:00 HOUR	43.0	58.5	39.8
02:00-03:00 HOUR	41.8	52.9	39.9
03:00-04:00 HOUR	43.3	56.9	41.2
04:00-05:00 HOUR	42.3	56.6	39.6
05:00-06:00 HOUR	42.8	54.2	40.5
06:00-07:00 HOUR	47.2	83.9	41.0
L <sub>Aeq</sub> 24 hours		43.7	





TIME*	RESULT dB(A)		
	มาตรฐาน FEBRUARY 28 - MARCH 1, 2022 T22AE131-0002		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	46.5	64.0	42.3
08:00-09:00 HOUR	46.4	72.9	40.6
09:00-10:00 HOUR	47.0	66.3	37.0
10:00-11:00 HOUR	46.9	78.1	34.4
11:00-12:00 HOUR	45.6	94.7	36.3
12:00-13:00 HOUR	47.3	75.0	36.3
13:00-14:00 HOUR	44.9	68.3	37.5
14:00-15:00 HOUR	48.0	74.5	36.8
15:00-16:00 HOUR	49.8	75.3	37.2
16:00-17:00 HOUR	45.4	75.8	36.6
17:00-18:00 HOUR	44.1	67.2	38.3
18:00-19:00 HOUR	44.3	63.8	39.2
19:00-20:00 HOUR	45.4	58.3	44.2
20:00-21:00 HOUR	47.4	61.0	44.7
21:00-22:00 HOUR	44.0	54.2	42.4
22:00-23:00 HOUR	44.2	59.3	42.5
23:00-00:00 HOUR	43.5	54.6	41.6
00:00-01:00 HOUR	42.2	58.2	40.2
01:00-02:00 HOUR	41.8	53.7	39.6
02:00-03:00 HOUR	39.9	50.1	38.3
03:00-04:00 HOUR	40.5	49.6	39.0
04:00-05:00 HOUR	41.6	59.5	39.2
05:00-06:00 HOUR	42.3	57.5	40.3
06:00-07:00 HOUR	49.0	72.4	41.9
L <sub>Aeq</sub> 24 hours		45.6	

TIME*	RESULT dB(A)		
	มาตรฐาน MARCH 1-2, 2022 T22AE131-0003		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	46.6	61.0	43.4
08:00-09:00 HOUR	43.4	64.9	39.0
09:00-10:00 HOUR	42.6	67.6	37.2
10:00-11:00 HOUR	42.2	62.2	36.0
11:00-12:00 HOUR	46.1	67.5	34.0
12:00-13:00 HOUR	44.9	66.8	34.4
13:00-14:00 HOUR	42.7	59.8	37.9
14:00-15:00 HOUR	42.8	64.9	39.8
15:00-16:00 HOUR	42.4	65.6	38.2
16:00-17:00 HOUR	43.7	58.7	40.6
17:00-18:00 HOUR	44.8	59.3	41.5
18:00-19:00 HOUR	43.1	57.9	40.7
19:00-20:00 HOUR	45.2	64.7	42.5
20:00-21:00 HOUR	48.0	59.3	46.3
21:00-22:00 HOUR	49.1	60.4	47.9
22:00-23:00 HOUR	44.3	55.6	41.7
23:00-00:00 HOUR	42.7	55.6	40.7
00:00-01:00 HOUR	43.3	56.4	41.3
01:00-02:00 HOUR	42.1	54.6	40.3
02:00-03:00 HOUR	43.4	54.4	41.9
03:00-04:00 HOUR	41.8	54.9	40.0
04:00-05:00 HOUR	41.4	51.0	39.8
05:00-06:00 HOUR	40.9	54.4	38.9
06:00-07:00 HOUR	48.8	75.4	41.9
L <sub>Aeq</sub> 24 hours		44.7	

(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022

## ANALYSIS REPORT

<b>CUSTOMER NAME</b>	: BANRAI ELECTRICITY GENERATING COMPANY LIMITED	<b>RECEIVED DATE</b>	: FEBRUARY 27 - MARCH 2, 2022
<b>ADDRESS</b>	: 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140	<b>ANALYTICAL DATE</b>	: FEBRUARY 27 - MARCH 2, 2022
<b>CONTACT INFORMATION</b>	: TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com	<b>REPORT NO.</b>	: 2022-U020009
<b>MEASURING SOURCE</b>	: โรงเรียนวัดทัพพนม	<b>WORK NO.</b>	: 2022-000024
<b>MEASURING TYPE</b>	: AMBIENT (NOISE)	<b>ANALYSIS NO.</b>	: T22AE131-0004 - T22AE131-0006
<b>MEASURING DATE</b>	: FEBRUARY 27 - MARCH 2, 2022		
<b>MEASURING TIME</b>	: *		
<b>MEASURING METHOD</b>	: INTEGRATED SOUND LEVEL METER		
<b>MEASURED BY</b>	: MR SIRAPAT JONGPHADUNGKIET		

TIME*	RESULT dB(A)		
	โรงเรียนวัดทัพพนม		
	FEBRUARY 27-28, 2022		
	T22AE131-0004		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.3	84.5	49.6
08:00-09:00 HOUR	53.3	74.9	43.1
09:00-10:00 HOUR	49.8	69.1	44.6
10:00-11:00 HOUR	49.1	69.6	42.6
11:00-12:00 HOUR	49.2	68.9	43.3
12:00-13:00 HOUR	51.5	86.4	44.8
13:00-14:00 HOUR	47.9	69.1	43.2
14:00-15:00 HOUR	54.4	86.2	44.3
15:00-16:00 HOUR	52.5	86.3	44.4
16:00-17:00 HOUR	50.1	76.2	43.0
17:00-18:00 HOUR	48.9	70.8	43.4
18:00-19:00 HOUR	50.3	76.0	44.3
19:00-20:00 HOUR	48.8	71.4	44.4
20:00-21:00 HOUR	49.4	70.0	41.7
21:00-22:00 HOUR	47.3	75.9	39.3
22:00-23:00 HOUR	41.9	76.4	38.7
23:00-00:00 HOUR	43.6	77.2	40.0
00:00-01:00 HOUR	45.1	55.3	43.0
01:00-02:00 HOUR	46.7	59.2	44.9
02:00-03:00 HOUR	48.4	56.0	47.1
03:00-04:00 HOUR	48.1	59.4	47.0
04:00-05:00 HOUR	46.8	60.7	44.4
05:00-06:00 HOUR	45.9	61.5	39.3
06:00-07:00 HOUR	53.9	85.1	46.5
L <sub>Aeq</sub> 24 hours		50.2	



TIME*	RESULT dB(A)		
	โรงเรียนวัดทัพพมณีน		
	FEBRUARY 28 - MARCH 1, 2022		
	T22AE131-0005		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.6	80.7	48.4
08:00-09:00 HOUR	52.5	71.2	44.5
09:00-10:00 HOUR	50.7	73.5	43.0
10:00-11:00 HOUR	48.0	65.7	42.6
11:00-12:00 HOUR	47.8	63.4	43.2
12:00-13:00 HOUR	50.5	71.0	45.5
13:00-14:00 HOUR	49.1	71.7	42.3
14:00-15:00 HOUR	49.2	86.0	42.1
15:00-16:00 HOUR	51.0	77.5	43.9
16:00-17:00 HOUR	50.5	75.3	42.9
17:00-18:00 HOUR	55.0	80.2	43.6
18:00-19:00 HOUR	51.8	72.1	44.0
19:00-20:00 HOUR	51.1	76.2	43.6
20:00-21:00 HOUR	50.2	79.1	41.0
21:00-22:00 HOUR	49.7	77.1	39.8
22:00-23:00 HOUR	43.2	54.7	39.9
23:00-00:00 HOUR	41.7	62.4	38.8
00:00-01:00 HOUR	46.8	60.4	44.4
01:00-02:00 HOUR	48.0	59.1	46.1
02:00-03:00 HOUR	47.4	64.1	45.4
03:00-04:00 HOUR	47.5	55.0	45.4
04:00-05:00 HOUR	45.6	58.6	43.3
05:00-06:00 HOUR	45.3	61.1	38.7
06:00-07:00 HOUR	51.1	86.3	42.9
L <sub>Aeq</sub> 24 hours		50.1	

TIME*	RESULT dB(A)		
	โรงเรียนวัดทัพพมณ		
	MARCH 1-2, 2022		
	T22AE131-0006		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	49.8	85.4	43.1
08:00-09:00 HOUR	53.1	81.1	41.0
09:00-10:00 HOUR	49.2	74.2	37.5
10:00-11:00 HOUR	49.5	71.2	40.4
11:00-12:00 HOUR	53.5	87.6	42.0
12:00-13:00 HOUR	47.1	71.2	41.7
13:00-14:00 HOUR	50.6	75.7	42.1
14:00-15:00 HOUR	47.5	67.9	42.1
15:00-16:00 HOUR	47.6	68.2	41.5
16:00-17:00 HOUR	52.0	87.2	42.9
17:00-18:00 HOUR	48.9	71.7	43.0
18:00-19:00 HOUR	49.1	69.6	43.5
19:00-20:00 HOUR	49.2	77.2	44.7
20:00-21:00 HOUR	48.4	74.9	43.2
21:00-22:00 HOUR	50.4	72.3	41.4
22:00-23:00 HOUR	44.5	71.7	41.5
23:00-00:00 HOUR	43.2	57.3	39.8
00:00-01:00 HOUR	42.9	53.8	39.9
01:00-02:00 HOUR	42.9	58.7	38.8
02:00-03:00 HOUR	43.3	59.6	36.9
03:00-04:00 HOUR	46.9	62.2	45.8
04:00-05:00 HOUR	46.4	60.4	44.0
05:00-06:00 HOUR	45.6	76.2	39.2
06:00-07:00 HOUR	52.4	82.9	41.8
L <sub>Aeq</sub> 24 hours		49.1	

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTRICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING PLACE** : บ้านศิลาทอง  
**MEASURING TYPE** : AMBIENT (ANNOYANCE NOISE)  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \*  
**MEASURING EQUIPMENT** : INTEGRATED SOUND LEVEL METER AND CALCULATION  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET

**RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**REPORT NO.** : 2022-U020006  
**WORK NO.** : 2022-000024  
**ANALYSIS NO.** : T22AE131-0001 - T22AE131-0003

DATE	TIME*	RESULT (dB(A))				
		บ้านศิลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 27, 2022	<b>DAY TIME</b> <sup>1/</sup>					
T22AE131-0001	07:00-08:00 HOUR	46.0 <sup>1/</sup>	41.1 **	44.5 <sup>1/</sup>	39.4 **	5.1
	08:00-09:00 HOUR	44.2 <sup>1/</sup>	41.1 **	41.2 <sup>1/</sup>	39.4 **	1.8
	09:00-10:00 HOUR	41.2 <sup>1/</sup>	41.1 **	34.2 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	10:00-11:00 HOUR	41.1 <sup>1/</sup>	41.1 **	34.1 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	11:00-12:00 HOUR	41.5 <sup>1/</sup>	41.1 **	34.5 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	12:00-13:00 HOUR	41.4 <sup>1/</sup>	41.1 **	34.4 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	13:00-14:00 HOUR	41.2 <sup>1/</sup>	41.1 **	34.2 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	14:00-15:00 HOUR	41.1 <sup>1/</sup>	41.1 **	34.1 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	15:00-16:00 HOUR	42.0 <sup>1/</sup>	41.1 **	35.0 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	16:00-17:00 HOUR	42.0 <sup>1/</sup>	41.1 **	35.0 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	17:00-18:00 HOUR	48.1 <sup>1/</sup>	41.1 **	47.1 <sup>1/</sup>	39.4 **	7.7
	18:00-19:00 HOUR	44.3 <sup>1/</sup>	41.1 **	41.3 <sup>1/</sup>	39.4 **	1.9
	19:00-20:00 HOUR	45.9 <sup>1/</sup>	41.1 **	44.4 <sup>1/</sup>	39.4 **	5.0
	20:00-21:00 HOUR	46.6 <sup>1/</sup>	41.1 **	45.1 <sup>1/</sup>	39.4 **	5.7
	21:00-22:00 HOUR	43.1 <sup>1/</sup>	41.1 **	38.6 <sup>1/</sup>	39.4 **	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:05-22:10 HOUR	39.9 <sup>2/</sup>	40.5 ***	35.9 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:10-22:15 HOUR	45.3 <sup>2/</sup>	40.5 ***	46.8 <sup>2/</sup>	38.6 ***	8.2
	22:15-22:20 HOUR	40.7 <sup>2/</sup>	40.5 ***	36.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:20-22:25 HOUR	40.9 <sup>2/</sup>	40.5 ***	36.9 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:25-22:30 HOUR	40.8 <sup>2/</sup>	40.5 ***	36.8 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:30-22:35 HOUR	40.8 <sup>2/</sup>	40.5 ***	36.8 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:35-22:40 HOUR	42.3 <sup>2/</sup>	40.5 ***	40.8 <sup>2/</sup>	38.6 ***	2.2
	22:40-22:45 HOUR	42.4 <sup>2/</sup>	40.5 ***	40.9 <sup>2/</sup>	38.6 ***	2.3
	22:45-22:50 HOUR	42.8 <sup>2/</sup>	40.5 ***	41.3 <sup>2/</sup>	38.6 ***	2.7
	22:50-22:55 HOUR	41.4 <sup>2/</sup>	40.5 ***	37.4 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:55-23:00 HOUR	41.2 <sup>2/</sup>	40.5 ***	37.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:00-23:05 HOUR	42.1 <sup>2/</sup>	40.5 ***	40.6 <sup>2/</sup>	38.6 ***	2.0
	23:05-23:10 HOUR	43.8 <sup>2/</sup>	40.5 ***	43.8 <sup>2/</sup>	38.6 ***	5.2
	23:10-23:15 HOUR	43.6 <sup>2/</sup>	40.5 ***	43.6 <sup>2/</sup>	38.6 ***	5.0
	23:15-23:20 HOUR	43.0 <sup>2/</sup>	40.5 ***	43.0 <sup>2/</sup>	38.6 ***	4.4
	23:20-23:25 HOUR	41.6 <sup>2/</sup>	40.5 ***	37.6 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:25-23:30 HOUR	42.3 <sup>2/</sup>	40.5 ***	40.8 <sup>2/</sup>	38.6 ***	2.2



DATE	TIME*	RESULT (dB(A))				
		บ้านติลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 27, 2022 T22AE131-0001	<b>NIGHT TIME</b> <sup>2/</sup>					
	23:30-23:35 HOUR	43.7 <sup>2/</sup>	40.5 ***	43.7 <sup>2/</sup>	38.6 ***	5.1
	23:35-23:40 HOUR	42.1 <sup>2/</sup>	40.5 ***	40.6 <sup>2/</sup>	38.6 ***	2.0
	23:40-23:45 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:45-23:50 HOUR	40.7 <sup>2/</sup>	40.5 ***	36.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:50-23:55 HOUR	44.3 <sup>2/</sup>	40.5 ***	45.3 <sup>2/</sup>	38.6 ***	6.7
FEBRUARY 28, 2022 T22AE131-0001	23:55-00:00 HOUR	41.0 <sup>2/</sup>	40.5 ***	37.0 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	00:00-00:05 HOUR	41.0 <sup>2/</sup>	40.5 ***	37.0 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:05-00:10 HOUR	41.1 <sup>2/</sup>	40.5 ***	37.1 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:10-00:15 HOUR	41.2 <sup>2/</sup>	40.5 ***	37.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:15-00:20 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:20-00:25 HOUR	39.9 <sup>2/</sup>	40.5 ***	35.9 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:25-00:30 HOUR	40.2 <sup>2/</sup>	40.5 ***	36.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:30-00:35 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:35-00:40 HOUR	42.6 <sup>2/</sup>	40.5 ***	41.1 <sup>2/</sup>	38.6 ***	2.5
	00:40-00:45 HOUR	40.8 <sup>2/</sup>	40.5 ***	36.8 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:45-00:50 HOUR	41.7 <sup>2/</sup>	40.5 ***	37.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:50-00:55 HOUR	41.6 <sup>2/</sup>	40.5 ***	37.6 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:55-01:00 HOUR	44.3 <sup>2/</sup>	40.5 ***	45.3 <sup>2/</sup>	38.6 ***	6.7
	01:00-01:05 HOUR	45.8 <sup>2/</sup>	40.5 ***	47.3 <sup>2/</sup>	38.6 ***	8.7
	01:05-01:10 HOUR	43.5 <sup>2/</sup>	40.5 ***	43.5 <sup>2/</sup>	38.6 ***	4.9
	01:10-01:15 HOUR	45.4 <sup>2/</sup>	40.5 ***	46.9 <sup>2/</sup>	38.6 ***	8.3
	01:15-01:20 HOUR	44.7 <sup>2/</sup>	40.5 ***	45.7 <sup>2/</sup>	38.6 ***	7.1
	01:20-01:25 HOUR	40.5 <sup>2/</sup>	40.5 ***	36.5 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:25-01:30 HOUR	41.4 <sup>2/</sup>	40.5 ***	37.4 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:30-01:35 HOUR	41.2 <sup>2/</sup>	40.5 ***	37.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:35-01:40 HOUR	41.6 <sup>2/</sup>	40.5 ***	37.6 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:40-01:45 HOUR	40.2 <sup>2/</sup>	40.5 ***	36.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:45-01:50 HOUR	44.2 <sup>2/</sup>	40.5 ***	45.2 <sup>2/</sup>	38.6 ***	6.6
	01:50-01:55 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:55-02:00 HOUR	40.2 <sup>2/</sup>	40.5 ***	36.2 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:00-02:05 HOUR	40.4 <sup>2/</sup>	40.5 ***	36.4 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:05-02:10 HOUR	39.6 <sup>2/</sup>	40.5 ***	35.6 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:10-02:15 HOUR	40.5 <sup>2/</sup>	40.5 ***	36.5 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:15-02:20 HOUR	40.7 <sup>2/</sup>	40.5 ***	36.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:20-02:25 HOUR	42.5 <sup>2/</sup>	40.5 ***	41.0 <sup>2/</sup>	38.6 ***	2.4
	02:25-02:30 HOUR	41.9 <sup>2/</sup>	40.5 ***	37.9 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:30-02:35 HOUR	41.7 <sup>2/</sup>	40.5 ***	37.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:35-02:40 HOUR	41.7 <sup>2/</sup>	40.5 ***	37.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:40-02:45 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:45-02:50 HOUR	42.7 <sup>2/</sup>	40.5 ***	41.2 <sup>2/</sup>	38.6 ***	2.6
	02:50-02:55 HOUR	43.6 <sup>2/</sup>	40.5 ***	43.6 <sup>2/</sup>	38.6 ***	5.0
	02:55-03:00 HOUR	42.9 <sup>2/</sup>	40.5 ***	41.4 <sup>2/</sup>	38.6 ***	2.8
	03:00-03:05 HOUR	43.8 <sup>2/</sup>	40.5 ***	43.8 <sup>2/</sup>	38.6 ***	5.2
	03:05-03:10 HOUR	44.6 <sup>2/</sup>	40.5 ***	45.6 <sup>2/</sup>	38.6 ***	7.0

DATE	TIME*	RESULT (dB(A))				
		มาตรฐาน				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 28, 2022 T22AE131-0001	<b>NIGHT TIME <sup>2/</sup></b>					
	03:10-03:15 HOUR	45.1 <sup>2/</sup>	40.5 ***	46.6 <sup>2/</sup>	38.6 ***	8.0
	03:15-03:20 HOUR	43.8 <sup>2/</sup>	40.5 ***	43.8 <sup>2/</sup>	38.6 ***	5.2
	03:20-03:25 HOUR	42.6 <sup>2/</sup>	40.5 ***	41.1 <sup>2/</sup>	38.6 ***	2.5
	03:25-03:30 HOUR	42.9 <sup>2/</sup>	40.5 ***	41.4 <sup>2/</sup>	38.6 ***	2.8
	03:30-03:35 HOUR	41.1 <sup>2/</sup>	40.5 ***	37.1 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:35-03:40 HOUR	42.3 <sup>2/</sup>	40.5 ***	40.8 <sup>2/</sup>	38.6 ***	2.2
	03:40-03:45 HOUR	43.7 <sup>2/</sup>	40.5 ***	43.7 <sup>2/</sup>	38.6 ***	5.1
	03:45-03:50 HOUR	41.8 <sup>2/</sup>	40.5 ***	37.8 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:50-03:55 HOUR	42.5 <sup>2/</sup>	40.5 ***	41.0 <sup>2/</sup>	38.6 ***	2.4
	03:55-04:00 HOUR	43.3 <sup>2/</sup>	40.5 ***	43.3 <sup>2/</sup>	38.6 ***	4.7
	04:00-04:05 HOUR	43.0 <sup>2/</sup>	40.5 ***	43.0 <sup>2/</sup>	38.6 ***	4.4
	04:05-04:10 HOUR	41.4 <sup>2/</sup>	40.5 ***	37.4 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:10-04:15 HOUR	40.9 <sup>2/</sup>	40.5 ***	36.9 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:15-04:20 HOUR	42.4 <sup>2/</sup>	40.5 ***	40.9 <sup>2/</sup>	38.6 ***	2.3
	04:20-04:25 HOUR	40.7 <sup>2/</sup>	40.5 ***	36.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:25-04:30 HOUR	43.5 <sup>2/</sup>	40.5 ***	43.5 <sup>2/</sup>	38.6 ***	4.9
	04:30-04:35 HOUR	42.8 <sup>2/</sup>	40.5 ***	41.3 <sup>2/</sup>	38.6 ***	2.7
	04:35-04:40 HOUR	40.7 <sup>2/</sup>	40.5 ***	36.7 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:40-04:45 HOUR	44.2 <sup>2/</sup>	40.5 ***	45.2 <sup>2/</sup>	38.6 ***	6.6
	04:45-04:50 HOUR	43.3 <sup>2/</sup>	40.5 ***	43.3 <sup>2/</sup>	38.6 ***	4.7
	04:50-04:55 HOUR	41.1 <sup>2/</sup>	40.5 ***	37.1 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:55-05:00 HOUR	41.6 <sup>2/</sup>	40.5 ***	37.6 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:00-05:05 HOUR	41.8 <sup>2/</sup>	40.5 ***	37.8 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:05-05:10 HOUR	43.7 <sup>2/</sup>	40.5 ***	43.7 <sup>2/</sup>	38.6 ***	5.1
	05:10-05:15 HOUR	43.0 <sup>2/</sup>	40.5 ***	43.0 <sup>2/</sup>	38.6 ***	4.4
	05:15-05:20 HOUR	43.5 <sup>2/</sup>	40.5 ***	43.5 <sup>2/</sup>	38.6 ***	4.9
	05:20-05:25 HOUR	42.8 <sup>2/</sup>	40.5 ***	41.3 <sup>2/</sup>	38.6 ***	2.7
	05:25-05:30 HOUR	41.3 <sup>2/</sup>	40.5 ***	37.3 <sup>2/</sup>	38.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:30-05:35 HOUR	42.1 <sup>2/</sup>	40.5 ***	40.6 <sup>2/</sup>	38.6 ***	2.0
	05:35-05:40 HOUR	43.7 <sup>2/</sup>	40.5 ***	43.7 <sup>2/</sup>	38.6 ***	5.1
	05:40-05:45 HOUR	42.4 <sup>2/</sup>	40.5 ***	40.9 <sup>2/</sup>	38.6 ***	2.3
	05:45-05:50 HOUR	43.9 <sup>2/</sup>	40.5 ***	43.9 <sup>2/</sup>	38.6 ***	5.3
	05:50-05:55 HOUR	42.2 <sup>2/</sup>	40.5 ***	40.7 <sup>2/</sup>	38.6 ***	2.1
	05:55-06:00 HOUR	42.1 <sup>2/</sup>	40.5 ***	40.6 <sup>2/</sup>	38.6 ***	2.0
FEBRUARY 28, 2022 T22AE131-0002	<b>DAY TIME <sup>1/</sup></b>					
	06:00-07:00 HOUR	47.2 <sup>1/</sup>	41.1 **	45.7 <sup>1/</sup>	39.4 **	6.3
	<b>DAY TIME <sup>1/</sup></b>					
	07:00-08:00 HOUR	46.5 <sup>1/</sup>	44.0 **	43.5 <sup>1/</sup>	42.8 **	0.7
	08:00-09:00 HOUR	46.4 <sup>1/</sup>	44.0 **	41.9 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	09:00-10:00 HOUR	47.0 <sup>1/</sup>	44.0 **	44.0 <sup>1/</sup>	42.8 **	1.2
	10:00-11:00 HOUR	46.9 <sup>1/</sup>	44.0 **	43.9 <sup>1/</sup>	42.8 **	1.1
	11:00-12:00 HOUR	45.6 <sup>1/</sup>	44.0 **	41.1 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	12:00-13:00 HOUR	47.3 <sup>1/</sup>	44.0 **	44.3 <sup>1/</sup>	42.8 **	1.5
	13:00-14:00 HOUR	44.9 <sup>1/</sup>	44.0 **	37.9 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	14:00-15:00 HOUR	48.0 <sup>1/</sup>	44.0 **	46.0 <sup>1/</sup>	42.8 **	3.2



DATE	TIME*	RESULT (dB(A))				
		บ้านติลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 28, 2022 T22AE131-0002	<b>DAY TIME</b> <sup>1/</sup>					
	15:00-16:00 HOUR	49.8 <sup>1/</sup>	44.0 **	48.3 <sup>1/</sup>	42.8 **	5.5
	16:00-17:00 HOUR	45.4 <sup>1/</sup>	44.0 **	38.4 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	17:00-18:00 HOUR	44.1 <sup>1/</sup>	44.0 **	37.1 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	18:00-19:00 HOUR	44.3 <sup>1/</sup>	44.0 **	37.3 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	19:00-20:00 HOUR	45.4 <sup>1/</sup>	44.0 **	38.4 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	20:00-21:00 HOUR	47.4 <sup>1/</sup>	44.0 **	44.4 <sup>1/</sup>	42.8 **	1.6
	21:00-22:00 HOUR	44.0 <sup>1/</sup>	44.0 **	37.0 <sup>1/</sup>	42.8 **	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	45.0 <sup>2/</sup>	39.7 ***	46.5 <sup>2/</sup>	37.9 ***	8.6
	22:05-22:10 HOUR	44.4 <sup>2/</sup>	39.7 ***	45.9 <sup>2/</sup>	37.9 ***	8.0
	22:10-22:15 HOUR	45.3 <sup>2/</sup>	39.7 ***	46.8 <sup>2/</sup>	37.9 ***	8.9
	22:15-22:20 HOUR	43.9 <sup>2/</sup>	39.7 ***	44.9 <sup>2/</sup>	37.9 ***	7.0
	22:20-22:25 HOUR	44.8 <sup>2/</sup>	39.7 ***	46.3 <sup>2/</sup>	37.9 ***	8.4
	22:25-22:30 HOUR	44.4 <sup>2/</sup>	39.7 ***	45.9 <sup>2/</sup>	37.9 ***	8.0
	22:30-22:35 HOUR	45.1 <sup>2/</sup>	39.7 ***	46.6 <sup>2/</sup>	37.9 ***	8.7
	22:35-22:40 HOUR	43.1 <sup>2/</sup>	39.7 ***	43.1 <sup>2/</sup>	37.9 ***	5.2
	22:40-22:45 HOUR	42.2 <sup>2/</sup>	39.7 ***	42.2 <sup>2/</sup>	37.9 ***	4.3
	22:45-22:50 HOUR	42.9 <sup>2/</sup>	39.7 ***	42.9 <sup>2/</sup>	37.9 ***	5.0
	22:50-22:55 HOUR	45.1 <sup>2/</sup>	39.7 ***	46.6 <sup>2/</sup>	37.9 ***	8.7
	22:55-23:00 HOUR	43.0 <sup>2/</sup>	39.7 ***	43.0 <sup>2/</sup>	37.9 ***	5.1
	23:00-23:05 HOUR	43.4 <sup>2/</sup>	39.7 ***	44.4 <sup>2/</sup>	37.9 ***	6.5
	23:05-23:10 HOUR	44.3 <sup>2/</sup>	39.7 ***	45.8 <sup>2/</sup>	37.9 ***	7.9
	23:10-23:15 HOUR	44.2 <sup>2/</sup>	39.7 ***	45.7 <sup>2/</sup>	37.9 ***	7.8
	23:15-23:20 HOUR	43.0 <sup>2/</sup>	39.7 ***	43.0 <sup>2/</sup>	37.9 ***	5.1
	23:20-23:25 HOUR	43.2 <sup>2/</sup>	39.7 ***	44.2 <sup>2/</sup>	37.9 ***	6.3
	23:25-23:30 HOUR	44.9 <sup>2/</sup>	39.7 ***	46.4 <sup>2/</sup>	37.9 ***	8.5
	23:30-23:35 HOUR	45.1 <sup>2/</sup>	39.7 ***	46.6 <sup>2/</sup>	37.9 ***	8.7
	23:35-23:40 HOUR	43.0 <sup>2/</sup>	39.7 ***	43.0 <sup>2/</sup>	37.9 ***	5.1
	23:40-23:45 HOUR	42.9 <sup>2/</sup>	39.7 ***	42.9 <sup>2/</sup>	37.9 ***	5.0
	23:45-23:50 HOUR	42.1 <sup>2/</sup>	39.7 ***	40.6 <sup>2/</sup>	37.9 ***	2.7
	23:50-23:55 HOUR	43.2 <sup>2/</sup>	39.7 ***	44.2 <sup>2/</sup>	37.9 ***	6.3
	23:55-00:00 HOUR	41.4 <sup>2/</sup>	39.7 ***	39.9 <sup>2/</sup>	37.9 ***	2.0
MARCH 1, 2022 T22AE131-0002	<b>NIGHT TIME</b> <sup>2/</sup>					
	00:00-00:05 HOUR	43.1 <sup>2/</sup>	39.7 ***	43.1 <sup>2/</sup>	37.9 ***	5.2
	00:05-00:10 HOUR	40.1 <sup>2/</sup>	39.7 ***	36.1 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:10-00:15 HOUR	41.8 <sup>2/</sup>	39.7 ***	40.3 <sup>2/</sup>	37.9 ***	2.4
	00:15-00:20 HOUR	42.3 <sup>2/</sup>	39.7 ***	42.3 <sup>2/</sup>	37.9 ***	4.4
	00:20-00:25 HOUR	42.5 <sup>2/</sup>	39.7 ***	42.5 <sup>2/</sup>	37.9 ***	4.6
	00:25-00:30 HOUR	42.0 <sup>2/</sup>	39.7 ***	40.5 <sup>2/</sup>	37.9 ***	2.6
	00:30-00:35 HOUR	41.3 <sup>2/</sup>	39.7 ***	39.8 <sup>2/</sup>	37.9 ***	1.9
	00:35-00:40 HOUR	41.9 <sup>2/</sup>	39.7 ***	40.4 <sup>2/</sup>	37.9 ***	2.5
	00:40-00:45 HOUR	42.1 <sup>2/</sup>	39.7 ***	40.6 <sup>2/</sup>	37.9 ***	2.7
	00:45-00:50 HOUR	41.9 <sup>2/</sup>	39.7 ***	40.4 <sup>2/</sup>	37.9 ***	2.5
	00:50-00:55 HOUR	43.0 <sup>2/</sup>	39.7 ***	43.0 <sup>2/</sup>	37.9 ***	5.1
	00:55-01:00 HOUR	43.6 <sup>2/</sup>	39.7 ***	44.6 <sup>2/</sup>	37.9 ***	6.7

DATE	TIME*	RESULT (dB(A))				
		บ้านคิลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0002	<b>NIGHT TIME <sup>2/</sup></b>					
	01:00-01:05 HOUR	44.6 <sup>2/</sup>	39.7 ***	46.1 <sup>2/</sup>	37.9 ***	8.2
	01:05-01:10 HOUR	42.2 <sup>2/</sup>	39.7 ***	42.2 <sup>2/</sup>	37.9 ***	4.3
	01:10-01:15 HOUR	42.7 <sup>2/</sup>	39.7 ***	42.7 <sup>2/</sup>	37.9 ***	4.8
	01:15-01:20 HOUR	41.4 <sup>2/</sup>	39.7 ***	39.9 <sup>2/</sup>	37.9 ***	2.0
	01:20-01:25 HOUR	41.4 <sup>2/</sup>	39.7 ***	39.9 <sup>2/</sup>	37.9 ***	2.0
	01:25-01:30 HOUR	41.3 <sup>2/</sup>	39.7 ***	39.8 <sup>2/</sup>	37.9 ***	1.9
	01:30-01:35 HOUR	41.2 <sup>2/</sup>	39.7 ***	39.7 <sup>2/</sup>	37.9 ***	1.8
	01:35-01:40 HOUR	39.7 <sup>2/</sup>	39.7 ***	35.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:40-01:45 HOUR	41.0 <sup>2/</sup>	39.7 ***	37.0 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:45-01:50 HOUR	43.0 <sup>2/</sup>	39.7 ***	43.0 <sup>2/</sup>	37.9 ***	5.1
	01:50-01:55 HOUR	39.7 <sup>2/</sup>	39.7 ***	35.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:55-02:00 HOUR	40.2 <sup>2/</sup>	39.7 ***	36.2 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:00-02:05 HOUR	42.0 <sup>2/</sup>	39.7 ***	40.5 <sup>2/</sup>	37.9 ***	2.6
	02:05-02:10 HOUR	40.0 <sup>2/</sup>	39.7 ***	36.0 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:10-02:15 HOUR	39.9 <sup>2/</sup>	39.7 ***	35.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:15-02:20 HOUR	39.6 <sup>2/</sup>	39.7 ***	35.6 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:20-02:25 HOUR	38.8 <sup>2/</sup>	39.7 ***	34.8 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:25-02:30 HOUR	39.6 <sup>2/</sup>	39.7 ***	35.6 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:30-02:35 HOUR	38.9 <sup>2/</sup>	39.7 ***	34.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:35-02:40 HOUR	38.4 <sup>2/</sup>	39.7 ***	34.4 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:40-02:45 HOUR	40.4 <sup>2/</sup>	39.7 ***	36.4 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:45-02:50 HOUR	40.0 <sup>2/</sup>	39.7 ***	36.0 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:50-02:55 HOUR	40.0 <sup>2/</sup>	39.7 ***	36.0 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:55-03:00 HOUR	40.5 <sup>2/</sup>	39.7 ***	36.5 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:00-03:05 HOUR	41.2 <sup>2/</sup>	39.7 ***	39.7 <sup>2/</sup>	37.9 ***	1.8
	03:05-03:10 HOUR	40.9 <sup>2/</sup>	39.7 ***	36.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:10-03:15 HOUR	40.1 <sup>2/</sup>	39.7 ***	36.1 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:15-03:20 HOUR	40.5 <sup>2/</sup>	39.7 ***	36.5 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:20-03:25 HOUR	40.9 <sup>2/</sup>	39.7 ***	36.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:25-03:30 HOUR	40.1 <sup>2/</sup>	39.7 ***	36.1 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:30-03:35 HOUR	41.1 <sup>2/</sup>	39.7 ***	37.1 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:35-03:40 HOUR	39.8 <sup>2/</sup>	39.7 ***	35.8 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:40-03:45 HOUR	39.1 <sup>2/</sup>	39.7 ***	35.1 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:45-03:50 HOUR	40.9 <sup>2/</sup>	39.7 ***	36.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:50-03:55 HOUR	40.7 <sup>2/</sup>	39.7 ***	36.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:55-04:00 HOUR	40.7 <sup>2/</sup>	39.7 ***	36.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:00-04:05 HOUR	40.9 <sup>2/</sup>	39.7 ***	36.9 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:05-04:10 HOUR	40.4 <sup>2/</sup>	39.7 ***	36.4 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:10-04:15 HOUR	40.7 <sup>2/</sup>	39.7 ***	36.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:15-04:20 HOUR	41.7 <sup>2/</sup>	39.7 ***	40.2 <sup>2/</sup>	37.9 ***	2.3
	04:20-04:25 HOUR	40.5 <sup>2/</sup>	39.7 ***	36.5 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:25-04:30 HOUR	43.6 <sup>2/</sup>	39.7 ***	44.6 <sup>2/</sup>	37.9 ***	6.7
	04:30-04:35 HOUR	40.8 <sup>2/</sup>	39.7 ***	36.8 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:35-04:40 HOUR	40.7 <sup>2/</sup>	39.7 ***	36.7 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:40-04:45 HOUR	42.8 <sup>2/</sup>	39.7 ***	42.8 <sup>2/</sup>	37.9 ***	4.9

DATE	TIME*	RESULT (dB(A))				
		บ้านติลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0002	<b>NIGHT TIME</b> <sup>2/</sup>					
	04:45-04:50 HOUR	43.4 <sup>2/</sup>	39.7 ***	44.4 <sup>2/</sup>	37.9 ***	6.5
	04:50-04:55 HOUR	41.3 <sup>2/</sup>	39.7 ***	39.8 <sup>2/</sup>	37.9 ***	1.9
	04:55-05:00 HOUR	40.2 <sup>2/</sup>	39.7 ***	36.2 <sup>2/</sup>	37.9 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:00-05:05 HOUR	41.3 <sup>2/</sup>	39.7 ***	39.8 <sup>2/</sup>	37.9 ***	1.9
	05:05-05:10 HOUR	41.8 <sup>2/</sup>	39.7 ***	40.3 <sup>2/</sup>	37.9 ***	2.4
	05:10-05:15 HOUR	42.4 <sup>2/</sup>	39.7 ***	42.4 <sup>2/</sup>	37.9 ***	4.5
	05:15-05:20 HOUR	42.0 <sup>2/</sup>	39.7 ***	40.5 <sup>2/</sup>	37.9 ***	2.6
	05:20-05:25 HOUR	41.9 <sup>2/</sup>	39.7 ***	40.4 <sup>2/</sup>	37.9 ***	2.5
	05:25-05:30 HOUR	43.8 <sup>2/</sup>	39.7 ***	44.8 <sup>2/</sup>	37.9 ***	6.9
	05:30-05:35 HOUR	43.9 <sup>2/</sup>	39.7 ***	44.9 <sup>2/</sup>	37.9 ***	7.0
	05:35-05:40 HOUR	42.5 <sup>2/</sup>	39.7 ***	42.5 <sup>2/</sup>	37.9 ***	4.6
	05:40-05:45 HOUR	41.4 <sup>2/</sup>	39.7 ***	39.9 <sup>2/</sup>	37.9 ***	2.0
	05:45-05:50 HOUR	41.3 <sup>2/</sup>	39.7 ***	39.8 <sup>2/</sup>	37.9 ***	1.9
	05:50-05:55 HOUR	42.3 <sup>2/</sup>	39.7 ***	42.3 <sup>2/</sup>	37.9 ***	4.4
	05:55-06:00 HOUR	42.6 <sup>2/</sup>	39.7 ***	42.6 <sup>2/</sup>	37.9 ***	4.7
	<b>DAY TIME</b> <sup>1/</sup>					
	06:00-07:00 HOUR	49.0 <sup>1/</sup>	44.0 **	47.5 <sup>1/</sup>	42.8 **	4.7
MARCH 1, 2022 T22AE131-0003	<b>DAY TIME</b> <sup>1/</sup>					
	07:00-08:00 HOUR	46.6 <sup>1/</sup>	42.1 **	45.1 <sup>1/</sup>	40.9 **	4.2
	08:00-09:00 HOUR	43.4 <sup>1/</sup>	42.1 **	36.4 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	09:00-10:00 HOUR	42.6 <sup>1/</sup>	42.1 **	35.6 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	10:00-11:00 HOUR	42.2 <sup>1/</sup>	42.1 **	35.2 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	11:00-12:00 HOUR	46.1 <sup>1/</sup>	42.1 **	44.1 <sup>1/</sup>	40.9 **	3.2
	12:00-13:00 HOUR	44.9 <sup>1/</sup>	42.1 **	41.9 <sup>1/</sup>	40.9 **	1.0
	13:00-14:00 HOUR	42.7 <sup>1/</sup>	42.1 **	35.7 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	14:00-15:00 HOUR	42.8 <sup>1/</sup>	42.1 **	35.8 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	15:00-16:00 HOUR	42.4 <sup>1/</sup>	42.1 **	35.4 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	16:00-17:00 HOUR	43.7 <sup>1/</sup>	42.1 **	39.2 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	17:00-18:00 HOUR	44.8 <sup>1/</sup>	42.1 **	41.8 <sup>1/</sup>	40.9 **	0.9
	18:00-19:00 HOUR	43.1 <sup>1/</sup>	42.1 **	36.1 <sup>1/</sup>	40.9 **	NOT SIGNIFICANT <sup>3/</sup>
	19:00-20:00 HOUR	45.2 <sup>1/</sup>	42.1 **	42.2 <sup>1/</sup>	40.9 **	1.3
	20:00-21:00 HOUR	48.0 <sup>1/</sup>	42.1 **	46.5 <sup>1/</sup>	40.9 **	5.6
	21:00-22:00 HOUR	49.1 <sup>1/</sup>	42.1 **	48.1 <sup>1/</sup>	40.9 **	7.2
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	44.5 <sup>2/</sup>	41.3 ***	44.5 <sup>2/</sup>	39.7 ***	4.8
	22:05-22:10 HOUR	44.6 <sup>2/</sup>	41.3 ***	44.6 <sup>2/</sup>	39.7 ***	4.9
	22:10-22:15 HOUR	47.0 <sup>2/</sup>	41.3 ***	48.5 <sup>2/</sup>	39.7 ***	8.8
	22:15-22:20 HOUR	45.7 <sup>2/</sup>	41.3 ***	46.7 <sup>2/</sup>	39.7 ***	7.0
	22:20-22:25 HOUR	43.9 <sup>2/</sup>	41.3 ***	43.9 <sup>2/</sup>	39.7 ***	4.2
	22:25-22:30 HOUR	44.6 <sup>2/</sup>	41.3 ***	44.6 <sup>2/</sup>	39.7 ***	4.9
	22:30-22:35 HOUR	43.3 <sup>2/</sup>	41.3 ***	41.8 <sup>2/</sup>	39.7 ***	2.1
	22:35-22:40 HOUR	43.0 <sup>2/</sup>	41.3 ***	41.5 <sup>2/</sup>	39.7 ***	1.8
	22:40-22:45 HOUR	43.3 <sup>2/</sup>	41.3 ***	41.8 <sup>2/</sup>	39.7 ***	2.1
	22:45-22:50 HOUR	43.5 <sup>2/</sup>	41.3 ***	42.0 <sup>2/</sup>	39.7 ***	2.3
	22:50-22:55 HOUR	43.2 <sup>2/</sup>	41.3 ***	41.7 <sup>2/</sup>	39.7 ***	2.0



DATE	TIME*	RESULT (dB(A))				
		บ้านคิลาทอง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0003	<b>NIGHT TIME <sup>2/</sup></b>					
	22:55-23:00 HOUR	43.3 <sup>2/</sup>	41.3 ***	41.8 <sup>2/</sup>	39.7 ***	2.1
	23:00-23:05 HOUR	43.7 <sup>2/</sup>	41.3 ***	42.2 <sup>2/</sup>	39.7 ***	2.5
	23:05-23:10 HOUR	42.9 <sup>2/</sup>	41.3 ***	41.4 <sup>2/</sup>	39.7 ***	1.7
	23:10-23:15 HOUR	43.4 <sup>2/</sup>	41.3 ***	41.9 <sup>2/</sup>	39.7 ***	2.2
	23:15-23:20 HOUR	42.1 <sup>2/</sup>	41.3 ***	38.1 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:20-23:25 HOUR	43.6 <sup>2/</sup>	41.3 ***	42.1 <sup>2/</sup>	39.7 ***	2.4
	23:25-23:30 HOUR	41.6 <sup>2/</sup>	41.3 ***	37.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:30-23:35 HOUR	42.4 <sup>2/</sup>	41.3 ***	38.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:35-23:40 HOUR	42.9 <sup>2/</sup>	41.3 ***	41.4 <sup>2/</sup>	39.7 ***	1.7
	23:40-23:45 HOUR	42.8 <sup>2/</sup>	41.3 ***	41.3 <sup>2/</sup>	39.7 ***	1.6
	23:45-23:50 HOUR	42.2 <sup>2/</sup>	41.3 ***	38.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:50-23:55 HOUR	42.8 <sup>2/</sup>	41.3 ***	41.3 <sup>2/</sup>	39.7 ***	1.6
	23:55-00:00 HOUR	41.2 <sup>2/</sup>	41.3 ***	37.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
MARCH 2, 2022 T22AE131-0003	<b>NIGHT TIME <sup>2/</sup></b>					
	00:00-00:05 HOUR	40.8 <sup>2/</sup>	41.3 ***	36.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:05-00:10 HOUR	42.0 <sup>2/</sup>	41.3 ***	38.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:10-00:15 HOUR	42.6 <sup>2/</sup>	41.3 ***	38.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:15-00:20 HOUR	44.0 <sup>2/</sup>	41.3 ***	44.0 <sup>2/</sup>	39.7 ***	4.3
	00:20-00:25 HOUR	44.3 <sup>2/</sup>	41.3 ***	44.3 <sup>2/</sup>	39.7 ***	4.6
	00:25-00:30 HOUR	43.5 <sup>2/</sup>	41.3 ***	42.0 <sup>2/</sup>	39.7 ***	2.3
	00:30-00:35 HOUR	44.9 <sup>2/</sup>	41.3 ***	45.9 <sup>2/</sup>	39.7 ***	6.2
	00:35-00:40 HOUR	44.1 <sup>2/</sup>	41.3 ***	44.1 <sup>2/</sup>	39.7 ***	4.4
	00:40-00:45 HOUR	43.6 <sup>2/</sup>	41.3 ***	42.1 <sup>2/</sup>	39.7 ***	2.4
	00:45-00:50 HOUR	43.6 <sup>2/</sup>	41.3 ***	42.1 <sup>2/</sup>	39.7 ***	2.4
	00:50-00:55 HOUR	43.2 <sup>2/</sup>	41.3 ***	41.7 <sup>2/</sup>	39.7 ***	2.0
	00:55-01:00 HOUR	41.9 <sup>2/</sup>	41.3 ***	37.9 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:00-01:05 HOUR	42.0 <sup>2/</sup>	41.3 ***	38.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:05-01:10 HOUR	43.7 <sup>2/</sup>	41.3 ***	42.2 <sup>2/</sup>	39.7 ***	2.5
	01:10-01:15 HOUR	43.5 <sup>2/</sup>	41.3 ***	42.0 <sup>2/</sup>	39.7 ***	2.3
	01:15-01:20 HOUR	42.6 <sup>2/</sup>	41.3 ***	38.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:20-01:25 HOUR	42.4 <sup>2/</sup>	41.3 ***	38.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:25-01:30 HOUR	41.5 <sup>2/</sup>	41.3 ***	37.5 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:30-01:35 HOUR	41.4 <sup>2/</sup>	41.3 ***	37.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:35-01:40 HOUR	42.0 <sup>2/</sup>	41.3 ***	38.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:40-01:45 HOUR	41.5 <sup>2/</sup>	41.3 ***	37.5 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:45-01:50 HOUR	40.8 <sup>2/</sup>	41.3 ***	36.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:50-01:55 HOUR	40.8 <sup>2/</sup>	41.3 ***	36.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:55-02:00 HOUR	42.4 <sup>2/</sup>	41.3 ***	38.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:00-02:05 HOUR	45.0 <sup>2/</sup>	41.3 ***	46.0 <sup>2/</sup>	39.7 ***	6.3
	02:05-02:10 HOUR	43.8 <sup>2/</sup>	41.3 ***	43.8 <sup>2/</sup>	39.7 ***	4.1
	02:10-02:15 HOUR	43.2 <sup>2/</sup>	41.3 ***	41.7 <sup>2/</sup>	39.7 ***	2.0
	02:15-02:20 HOUR	43.4 <sup>2/</sup>	41.3 ***	41.9 <sup>2/</sup>	39.7 ***	2.2
	02:20-02:25 HOUR	44.6 <sup>2/</sup>	41.3 ***	44.6 <sup>2/</sup>	39.7 ***	4.9
	02:25-02:30 HOUR	44.1 <sup>2/</sup>	41.3 ***	44.1 <sup>2/</sup>	39.7 ***	4.4
	02:30-02:35 HOUR	43.6 <sup>2/</sup>	41.3 ***	42.1 <sup>2/</sup>	39.7 ***	2.4

DATE	TIME*	RESULT (dB(A))				
		ปานกลาง				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 2, 2022 T22AE131-0003	<b>NIGHT TIME <sup>2/</sup></b>					
	02:35-02:40 HOUR	44.0 <sup>2/</sup>	41.3 ***	44.0 <sup>2/</sup>	39.7 ***	4.3
	02:40-02:45 HOUR	42.7 <sup>2/</sup>	41.3 ***	38.7 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:45-02:50 HOUR	42.1 <sup>2/</sup>	41.3 ***	38.1 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:50-02:55 HOUR	42.0 <sup>2/</sup>	41.3 ***	38.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:55-03:00 HOUR	40.7 <sup>2/</sup>	41.3 ***	36.7 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:00-03:05 HOUR	40.8 <sup>2/</sup>	41.3 ***	36.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:05-03:10 HOUR	40.9 <sup>2/</sup>	41.3 ***	36.9 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:10-03:15 HOUR	42.2 <sup>2/</sup>	41.3 ***	38.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:15-03:20 HOUR	42.2 <sup>2/</sup>	41.3 ***	38.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:20-03:25 HOUR	41.5 <sup>2/</sup>	41.3 ***	37.5 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:25-03:30 HOUR	41.4 <sup>2/</sup>	41.3 ***	37.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:30-03:35 HOUR	40.5 <sup>2/</sup>	41.3 ***	36.5 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:35-03:40 HOUR	40.6 <sup>2/</sup>	41.3 ***	36.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:40-03:45 HOUR	41.6 <sup>2/</sup>	41.3 ***	37.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:45-03:50 HOUR	41.7 <sup>2/</sup>	41.3 ***	37.7 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:50-03:55 HOUR	44.4 <sup>2/</sup>	41.3 ***	44.4 <sup>2/</sup>	39.7 ***	4.7
	03:55-04:00 HOUR	42.1 <sup>2/</sup>	41.3 ***	38.1 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:00-04:05 HOUR	40.4 <sup>2/</sup>	41.3 ***	36.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:05-04:10 HOUR	42.1 <sup>2/</sup>	41.3 ***	38.1 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:10-04:15 HOUR	41.5 <sup>2/</sup>	41.3 ***	37.5 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:15-04:20 HOUR	42.4 <sup>2/</sup>	41.3 ***	38.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:20-04:25 HOUR	40.7 <sup>2/</sup>	41.3 ***	36.7 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:25-04:30 HOUR	41.9 <sup>2/</sup>	41.3 ***	37.9 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:30-04:35 HOUR	42.2 <sup>2/</sup>	41.3 ***	38.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:35-04:40 HOUR	41.6 <sup>2/</sup>	41.3 ***	37.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:40-04:45 HOUR	41.6 <sup>2/</sup>	41.3 ***	37.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:45-04:50 HOUR	41.0 <sup>2/</sup>	41.3 ***	37.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:50-04:55 HOUR	40.4 <sup>2/</sup>	41.3 ***	36.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:55-05:00 HOUR	39.7 <sup>2/</sup>	41.3 ***	35.7 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:00-05:05 HOUR	40.9 <sup>2/</sup>	41.3 ***	36.9 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:05-05:10 HOUR	41.8 <sup>2/</sup>	41.3 ***	37.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:10-05:15 HOUR	41.6 <sup>2/</sup>	41.3 ***	37.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:15-05:20 HOUR	40.6 <sup>2/</sup>	41.3 ***	36.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:20-05:25 HOUR	41.4 <sup>2/</sup>	41.3 ***	37.4 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:25-05:30 HOUR	41.8 <sup>2/</sup>	41.3 ***	37.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:30-05:35 HOUR	40.2 <sup>2/</sup>	41.3 ***	36.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:35-05:40 HOUR	41.0 <sup>2/</sup>	41.3 ***	37.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:40-05:45 HOUR	40.6 <sup>2/</sup>	41.3 ***	36.6 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:45-05:50 HOUR	39.8 <sup>2/</sup>	41.3 ***	35.8 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:50-05:55 HOUR	40.2 <sup>2/</sup>	41.3 ***	36.2 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:55-06:00 HOUR	40.0 <sup>2/</sup>	41.3 ***	36.0 <sup>2/</sup>	39.7 ***	NOT SIGNIFICANT <sup>3/</sup>
	<b>DAY TIME <sup>1/</sup></b>					
	06:00-07:00 HOUR	48.8 <sup>1/</sup>	42.1 **	47.8 <sup>1/</sup>	40.9 **	6.9

**REMARK :**

- 1/ CASE 1 CALCULATION (DURING 06:00 TO 22:00 HOUR) : SPECIFIC NOISE LEVEL CONTINUOUSLY OCCUR AT LEAST 1 HOUR, MEASURING AS  $L_{Aeq}$  1 hour.
- 2/ CASE 4 CALCULATION (DURING 22:00 TO 06:00 HOUR) : SPECIFIC NOISE LEVEL OCCUR IN RESTFUL AREA OR NIGHT TIME, MEASURING AS  $L_{Aeq}$  5 minutes.
- 3/ NOT SIGNIFICANT MEANS ANNOYING NOISE LEVEL IS LOWER THAN 0.
- \*\* PERCENTILE LEVEL 90 ( $L_{A90}$ ) IS MIDDLE VALUE OF 3 TIMES MEASURING.  
(15 MINUTES MEASURING DURING 06:00 TO 22:00 HOUR)  
AND RESIDUAL NOISE LEVEL ( $L_{Aeq}$  5 minutes) IS CHOSE AT THE SAME TIME AS PERCENTILE LEVEL 90 ABOVE.
- \*\*\* PERCENTILE LEVEL 90 ( $L_{A90}$ ) IS MIDDLE VALUE OF 3 TIMES MEASURING.  
(15 MINUTES MEASURING DURING 22:00 TO 06:00 HOUR)  
AND RESIDUAL NOISE LEVEL ( $L_{Aeq}$  5 minutes) IS CHOSE AT THE SAME TIME AS PERCENTILE LEVEL 90 ABOVE.

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022

## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTRICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING PLACE** : โรงเรียนวัดทัพพนัน  
**MEASURING TYPE** : AMBIENT (ANNOYANCE NOISE)  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \*  
**MEASURING EQUIPMENT** : INTEGRATED SOUND LEVEL METER AND CALCULATION  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET

**RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**REPORT NO.** : 2022-U020007  
**WORK NO.** : 2022-000024  
**ANALYSIS NO.** : T22AE131-0004 - T22AE131-0006

DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดทัพพนัน				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 27, 2022 T22AE131-0004	<b>DAY TIME</b> <sup>1/</sup>					
	07:00-08:00 HOUR	54.3 <sup>1/</sup>	47.3 **	53.3 <sup>1/</sup>	45.0 **	8.3
	08:00-09:00 HOUR	53.3 <sup>1/</sup>	47.3 **	51.8 <sup>1/</sup>	45.0 **	6.8
	09:00-10:00 HOUR	49.8 <sup>1/</sup>	47.3 **	46.8 <sup>1/</sup>	45.0 **	1.8
	10:00-11:00 HOUR	49.1 <sup>1/</sup>	47.3 **	44.6 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	11:00-12:00 HOUR	49.2 <sup>1/</sup>	47.3 **	44.7 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	12:00-13:00 HOUR	51.5 <sup>1/</sup>	47.3 **	49.5 <sup>1/</sup>	45.0 **	4.5
	13:00-14:00 HOUR	47.9 <sup>1/</sup>	47.3 **	40.9 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	14:00-15:00 HOUR	54.4 <sup>1/</sup>	47.3 **	53.4 <sup>1/</sup>	45.0 **	8.4
	15:00-16:00 HOUR	52.5 <sup>1/</sup>	47.3 **	51.0 <sup>1/</sup>	45.0 **	6.0
	16:00-17:00 HOUR	50.1 <sup>1/</sup>	47.3 **	47.1 <sup>1/</sup>	45.0 **	2.1
	17:00-18:00 HOUR	48.9 <sup>1/</sup>	47.3 **	44.4 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	18:00-19:00 HOUR	50.3 <sup>1/</sup>	47.3 **	47.3 <sup>1/</sup>	45.0 **	2.3
	19:00-20:00 HOUR	48.8 <sup>1/</sup>	47.3 **	44.3 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	20:00-21:00 HOUR	49.4 <sup>1/</sup>	47.3 **	44.9 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	21:00-22:00 HOUR	47.3 <sup>1/</sup>	47.3 **	40.3 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	41.6 <sup>2/</sup>	43.5 ***	37.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:05-22:10 HOUR	42.0 <sup>2/</sup>	43.5 ***	38.0 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:10-22:15 HOUR	41.6 <sup>2/</sup>	43.5 ***	37.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:15-22:20 HOUR	40.6 <sup>2/</sup>	43.5 ***	36.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:20-22:25 HOUR	42.1 <sup>2/</sup>	43.5 ***	38.1 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:25-22:30 HOUR	43.6 <sup>2/</sup>	43.5 ***	39.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:30-22:35 HOUR	42.0 <sup>2/</sup>	43.5 ***	38.0 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:35-22:40 HOUR	39.5 <sup>2/</sup>	43.5 ***	35.5 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:40-22:45 HOUR	43.8 <sup>2/</sup>	43.5 ***	39.8 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:45-22:50 HOUR	42.6 <sup>2/</sup>	43.5 ***	38.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:50-22:55 HOUR	41.7 <sup>2/</sup>	43.5 ***	37.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:55-23:00 HOUR	39.8 <sup>2/</sup>	43.5 ***	35.8 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:00-23:05 HOUR	39.8 <sup>2/</sup>	43.5 ***	35.8 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:05-23:10 HOUR	44.3 <sup>2/</sup>	43.5 ***	40.3 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:10-23:15 HOUR	43.6 <sup>2/</sup>	43.5 ***	39.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:15-23:20 HOUR	43.5 <sup>2/</sup>	43.5 ***	39.5 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:20-23:25 HOUR	43.9 <sup>2/</sup>	43.5 ***	39.9 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:25-23:30 HOUR	41.9 <sup>2/</sup>	43.5 ***	37.9 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>





DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดเทพนิมิต				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 27, 2022 T22AE131-0004	<b>NIGHT TIME</b> <sup>2/</sup>					
	23:30-23:35 HOUR	42.7 <sup>2/</sup>	43.5 ***	38.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:35-23:40 HOUR	46.4 <sup>2/</sup>	43.5 ***	46.4 <sup>2/</sup>	41.6 ***	4.8
	23:40-23:45 HOUR	42.4 <sup>2/</sup>	43.5 ***	38.4 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:45-23:50 HOUR	43.7 <sup>2/</sup>	43.5 ***	39.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:50-23:55 HOUR	43.9 <sup>2/</sup>	43.5 ***	39.9 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
FEBRUARY 28, 2022 T22AE131-0004	23:55-00:00 HOUR	44.4 <sup>2/</sup>	43.5 ***	40.4 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	00:00-00:05 HOUR	44.7 <sup>2/</sup>	43.5 ***	40.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:05-00:10 HOUR	42.6 <sup>2/</sup>	43.5 ***	38.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:10-00:15 HOUR	43.9 <sup>2/</sup>	43.5 ***	39.9 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:15-00:20 HOUR	44.7 <sup>2/</sup>	43.5 ***	40.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:20-00:25 HOUR	43.6 <sup>2/</sup>	43.5 ***	39.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:25-00:30 HOUR	45.5 <sup>2/</sup>	43.5 ***	44.0 <sup>2/</sup>	41.6 ***	2.4
	00:30-00:35 HOUR	45.7 <sup>2/</sup>	43.5 ***	44.2 <sup>2/</sup>	41.6 ***	2.6
	00:35-00:40 HOUR	45.8 <sup>2/</sup>	43.5 ***	44.3 <sup>2/</sup>	41.6 ***	2.7
	00:40-00:45 HOUR	44.3 <sup>2/</sup>	43.5 ***	40.3 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:45-00:50 HOUR	45.8 <sup>2/</sup>	43.5 ***	44.3 <sup>2/</sup>	41.6 ***	2.7
	00:50-00:55 HOUR	47.0 <sup>2/</sup>	43.5 ***	48.0 <sup>2/</sup>	41.6 ***	6.4
	00:55-01:00 HOUR	45.6 <sup>2/</sup>	43.5 ***	44.1 <sup>2/</sup>	41.6 ***	2.5
	01:00-01:05 HOUR	45.6 <sup>2/</sup>	43.5 ***	44.1 <sup>2/</sup>	41.6 ***	2.5
	01:05-01:10 HOUR	46.1 <sup>2/</sup>	43.5 ***	46.1 <sup>2/</sup>	41.6 ***	4.5
	01:10-01:15 HOUR	46.5 <sup>2/</sup>	43.5 ***	46.5 <sup>2/</sup>	41.6 ***	4.9
	01:15-01:20 HOUR	46.9 <sup>2/</sup>	43.5 ***	46.9 <sup>2/</sup>	41.6 ***	5.3
	01:20-01:25 HOUR	46.7 <sup>2/</sup>	43.5 ***	46.7 <sup>2/</sup>	41.6 ***	5.1
	01:25-01:30 HOUR	46.2 <sup>2/</sup>	43.5 ***	46.2 <sup>2/</sup>	41.6 ***	4.6
	01:30-01:35 HOUR	46.5 <sup>2/</sup>	43.5 ***	46.5 <sup>2/</sup>	41.6 ***	4.9
	01:35-01:40 HOUR	47.0 <sup>2/</sup>	43.5 ***	48.0 <sup>2/</sup>	41.6 ***	6.4
	01:40-01:45 HOUR	46.1 <sup>2/</sup>	43.5 ***	46.1 <sup>2/</sup>	41.6 ***	4.5
	01:45-01:50 HOUR	47.5 <sup>2/</sup>	43.5 ***	48.5 <sup>2/</sup>	41.6 ***	6.9
	01:50-01:55 HOUR	46.5 <sup>2/</sup>	43.5 ***	46.5 <sup>2/</sup>	41.6 ***	4.9
	01:55-02:00 HOUR	48.4 <sup>2/</sup>	43.5 ***	49.9 <sup>2/</sup>	41.6 ***	8.3
	02:00-02:05 HOUR	48.7 <sup>2/</sup>	43.5 ***	50.2 <sup>2/</sup>	41.6 ***	8.6
	02:05-02:10 HOUR	48.9 <sup>2/</sup>	43.5 ***	50.4 <sup>2/</sup>	41.6 ***	8.8
	02:10-02:15 HOUR	48.5 <sup>2/</sup>	43.5 ***	50.0 <sup>2/</sup>	41.6 ***	8.4
	02:15-02:20 HOUR	47.8 <sup>2/</sup>	43.5 ***	48.8 <sup>2/</sup>	41.6 ***	7.2
	02:20-02:25 HOUR	48.3 <sup>2/</sup>	43.5 ***	49.8 <sup>2/</sup>	41.6 ***	8.2
	02:25-02:30 HOUR	48.6 <sup>2/</sup>	43.5 ***	50.1 <sup>2/</sup>	41.6 ***	8.5
	02:30-02:35 HOUR	48.0 <sup>2/</sup>	43.5 ***	49.5 <sup>2/</sup>	41.6 ***	7.9
	02:35-02:40 HOUR	47.9 <sup>2/</sup>	43.5 ***	48.9 <sup>2/</sup>	41.6 ***	7.3
	02:40-02:45 HOUR	48.3 <sup>2/</sup>	43.5 ***	49.8 <sup>2/</sup>	41.6 ***	8.2
	02:45-02:50 HOUR	48.6 <sup>2/</sup>	43.5 ***	50.1 <sup>2/</sup>	41.6 ***	8.5
	02:50-02:55 HOUR	48.8 <sup>2/</sup>	43.5 ***	50.3 <sup>2/</sup>	41.6 ***	8.7
	02:55-03:00 HOUR	48.1 <sup>2/</sup>	43.5 ***	49.6 <sup>2/</sup>	41.6 ***	8.0
	03:00-03:05 HOUR	48.6 <sup>2/</sup>	43.5 ***	50.1 <sup>2/</sup>	41.6 ***	8.5
	03:05-03:10 HOUR	48.5 <sup>2/</sup>	43.5 ***	50.0 <sup>2/</sup>	41.6 ***	8.4



DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดทัพพนิม				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 28, 2022 T22AE131-0004	<b>NIGHT TIME</b> <sup>2/</sup>					
	03:10-03:15 HOUR	48.6 <sup>2/</sup>	43.5 ***	50.1 <sup>2/</sup>	41.6 ***	8.5
	03:15-03:20 HOUR	48.5 <sup>2/</sup>	43.5 ***	50.0 <sup>2/</sup>	41.6 ***	8.4
	03:20-03:25 HOUR	48.3 <sup>2/</sup>	43.5 ***	49.8 <sup>2/</sup>	41.6 ***	8.2
	03:25-03:30 HOUR	48.7 <sup>2/</sup>	43.5 ***	50.2 <sup>2/</sup>	41.6 ***	8.6
	03:30-03:35 HOUR	48.8 <sup>2/</sup>	43.5 ***	50.3 <sup>2/</sup>	41.6 ***	8.7
	03:35-03:40 HOUR	47.9 <sup>2/</sup>	43.5 ***	48.9 <sup>2/</sup>	41.6 ***	7.3
	03:40-03:45 HOUR	47.4 <sup>2/</sup>	43.5 ***	48.4 <sup>2/</sup>	41.6 ***	6.8
	03:45-03:50 HOUR	48.0 <sup>2/</sup>	43.5 ***	49.5 <sup>2/</sup>	41.6 ***	7.9
	03:50-03:55 HOUR	47.1 <sup>2/</sup>	43.5 ***	48.1 <sup>2/</sup>	41.6 ***	6.5
	03:55-04:00 HOUR	46.0 <sup>2/</sup>	43.5 ***	46.0 <sup>2/</sup>	41.6 ***	4.4
	04:00-04:05 HOUR	45.3 <sup>2/</sup>	43.5 ***	43.8 <sup>2/</sup>	41.6 ***	2.2
	04:05-04:10 HOUR	44.6 <sup>2/</sup>	43.5 ***	40.6 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:10-04:15 HOUR	47.3 <sup>2/</sup>	43.5 ***	48.3 <sup>2/</sup>	41.6 ***	6.7
	04:15-04:20 HOUR	47.0 <sup>2/</sup>	43.5 ***	48.0 <sup>2/</sup>	41.6 ***	6.4
	04:20-04:25 HOUR	47.0 <sup>2/</sup>	43.5 ***	48.0 <sup>2/</sup>	41.6 ***	6.4
	04:25-04:30 HOUR	48.7 <sup>2/</sup>	43.5 ***	50.2 <sup>2/</sup>	41.6 ***	8.6
	04:30-04:35 HOUR	47.7 <sup>2/</sup>	43.5 ***	48.7 <sup>2/</sup>	41.6 ***	7.1
	04:35-04:40 HOUR	46.9 <sup>2/</sup>	43.5 ***	46.9 <sup>2/</sup>	41.6 ***	5.3
	04:40-04:45 HOUR	48.1 <sup>2/</sup>	43.5 ***	49.6 <sup>2/</sup>	41.6 ***	8.0
	04:45-04:50 HOUR	46.3 <sup>2/</sup>	43.5 ***	46.3 <sup>2/</sup>	41.6 ***	4.7
	04:50-04:55 HOUR	44.7 <sup>2/</sup>	43.5 ***	40.7 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:55-05:00 HOUR	46.1 <sup>2/</sup>	43.5 ***	46.1 <sup>2/</sup>	41.6 ***	4.5
	05:00-05:05 HOUR	44.5 <sup>2/</sup>	43.5 ***	40.5 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:05-05:10 HOUR	45.7 <sup>2/</sup>	43.5 ***	44.2 <sup>2/</sup>	41.6 ***	2.6
	05:10-05:15 HOUR	47.6 <sup>2/</sup>	43.5 ***	48.6 <sup>2/</sup>	41.6 ***	7.0
	05:15-05:20 HOUR	46.7 <sup>2/</sup>	43.5 ***	46.7 <sup>2/</sup>	41.6 ***	5.1
	05:20-05:25 HOUR	45.7 <sup>2/</sup>	43.5 ***	44.2 <sup>2/</sup>	41.6 ***	2.6
	05:25-05:30 HOUR	42.2 <sup>2/</sup>	43.5 ***	38.2 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:30-05:35 HOUR	42.1 <sup>2/</sup>	43.5 ***	38.1 <sup>2/</sup>	41.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:35-05:40 HOUR	46.3 <sup>2/</sup>	43.5 ***	46.3 <sup>2/</sup>	41.6 ***	4.7
	05:40-05:45 HOUR	45.1 <sup>2/</sup>	43.5 ***	43.6 <sup>2/</sup>	41.6 ***	2.0
	05:45-05:50 HOUR	46.3 <sup>2/</sup>	43.5 ***	46.3 <sup>2/</sup>	41.6 ***	4.7
	05:50-05:55 HOUR	47.3 <sup>2/</sup>	43.5 ***	48.3 <sup>2/</sup>	41.6 ***	6.7
	05:55-06:00 HOUR	47.1 <sup>2/</sup>	43.5 ***	48.1 <sup>2/</sup>	41.6 ***	6.5
FEBRUARY 28, 2022 T22AE131-0005	<b>DAY TIME</b> <sup>1/</sup>					
	06:00-07:00 HOUR	53.9 <sup>1/</sup>	47.3 **	52.9 <sup>1/</sup>	45.0 **	7.9
	<b>DAY TIME</b> <sup>1/</sup>					
	07:00-08:00 HOUR	54.6 <sup>1/</sup>	47.7 **	53.6 <sup>1/</sup>	45.3 **	8.3
	08:00-09:00 HOUR	52.5 <sup>1/</sup>	47.7 **	51.0 <sup>1/</sup>	45.3 **	5.7
	09:00-10:00 HOUR	50.7 <sup>1/</sup>	47.7 **	47.7 <sup>1/</sup>	45.3 **	2.4
	10:00-11:00 HOUR	48.0 <sup>1/</sup>	47.7 **	41.0 <sup>1/</sup>	45.3 **	NOT SIGNIFICANT <sup>3/</sup>
	11:00-12:00 HOUR	47.8 <sup>1/</sup>	47.7 **	40.8 <sup>1/</sup>	45.3 **	NOT SIGNIFICANT <sup>3/</sup>
	12:00-13:00 HOUR	50.5 <sup>1/</sup>	47.7 **	47.5 <sup>1/</sup>	45.3 **	2.2
	13:00-14:00 HOUR	49.1 <sup>1/</sup>	47.7 **	42.1 <sup>1/</sup>	45.3 **	NOT SIGNIFICANT <sup>3/</sup>
	14:00-15:00 HOUR	49.2 <sup>1/</sup>	47.7 **	44.7 <sup>1/</sup>	45.3 **	NOT SIGNIFICANT <sup>3/</sup>

DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดเทพนิมิต				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
FEBRUARY 28, 2022	<b>DAY TIME</b> <sup>1/</sup>					
T22AE131-0005	15:00-16:00 HOUR	51.0 <sup>1/</sup>	47.7 **	48.0 <sup>1/</sup>	45.3 **	2.7
	16:00-17:00 HOUR	50.5 <sup>1/</sup>	47.7 **	47.5 <sup>1/</sup>	45.3 **	2.2
	17:00-18:00 HOUR	55.0 <sup>1/</sup>	47.7 **	54.0 <sup>1/</sup>	45.3 **	8.7
	18:00-19:00 HOUR	51.8 <sup>1/</sup>	47.7 **	49.8 <sup>1/</sup>	45.3 **	4.5
	19:00-20:00 HOUR	51.1 <sup>1/</sup>	47.7 **	48.1 <sup>1/</sup>	45.3 **	2.8
	20:00-21:00 HOUR	50.2 <sup>1/</sup>	47.7 **	47.2 <sup>1/</sup>	45.3 **	1.9
	21:00-22:00 HOUR	49.7 <sup>1/</sup>	47.7 **	45.2 <sup>1/</sup>	45.3 **	NOT SIGNIFICANT <sup>3/</sup>
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	43.6 <sup>2/</sup>	44.5 ***	39.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:05-22:10 HOUR	44.4 <sup>2/</sup>	44.5 ***	40.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:10-22:15 HOUR	43.6 <sup>2/</sup>	44.5 ***	39.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:15-22:20 HOUR	45.2 <sup>2/</sup>	44.5 ***	41.2 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:20-22:25 HOUR	44.1 <sup>2/</sup>	44.5 ***	40.1 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:25-22:30 HOUR	44.1 <sup>2/</sup>	44.5 ***	40.1 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:30-22:35 HOUR	42.8 <sup>2/</sup>	44.5 ***	38.8 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:35-22:40 HOUR	42.4 <sup>2/</sup>	44.5 ***	38.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:40-22:45 HOUR	44.4 <sup>2/</sup>	44.5 ***	40.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:45-22:50 HOUR	39.4 <sup>2/</sup>	44.5 ***	35.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:50-22:55 HOUR	40.3 <sup>2/</sup>	44.5 ***	36.3 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:55-23:00 HOUR	39.4 <sup>2/</sup>	44.5 ***	35.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:00-23:05 HOUR	40.7 <sup>2/</sup>	44.5 ***	36.7 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:05-23:10 HOUR	42.9 <sup>2/</sup>	44.5 ***	38.9 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:10-23:15 HOUR	40.4 <sup>2/</sup>	44.5 ***	36.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:15-23:20 HOUR	40.2 <sup>2/</sup>	44.5 ***	36.2 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:20-23:25 HOUR	41.2 <sup>2/</sup>	44.5 ***	37.2 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:25-23:30 HOUR	41.7 <sup>2/</sup>	44.5 ***	37.7 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:30-23:35 HOUR	41.9 <sup>2/</sup>	44.5 ***	37.9 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:35-23:40 HOUR	41.5 <sup>2/</sup>	44.5 ***	37.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:40-23:45 HOUR	41.6 <sup>2/</sup>	44.5 ***	37.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:45-23:50 HOUR	40.9 <sup>2/</sup>	44.5 ***	36.9 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:50-23:55 HOUR	42.1 <sup>2/</sup>	44.5 ***	38.1 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:55-00:00 HOUR	43.8 <sup>2/</sup>	44.5 ***	39.8 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
MARCH 1, 2022	<b>NIGHT TIME</b> <sup>2/</sup>					
T22AE131-0005	00:00-00:05 HOUR	47.0 <sup>2/</sup>	44.5 ***	47.0 <sup>2/</sup>	42.8 ***	4.2
	00:05-00:10 HOUR	48.5 <sup>2/</sup>	44.5 ***	49.5 <sup>2/</sup>	42.8 ***	6.7
	00:10-00:15 HOUR	46.2 <sup>2/</sup>	44.5 ***	44.7 <sup>2/</sup>	42.8 ***	1.9
	00:15-00:20 HOUR	48.0 <sup>2/</sup>	44.5 ***	49.0 <sup>2/</sup>	42.8 ***	6.2
	00:20-00:25 HOUR	48.3 <sup>2/</sup>	44.5 ***	49.3 <sup>2/</sup>	42.8 ***	6.5
	00:25-00:30 HOUR	46.3 <sup>2/</sup>	44.5 ***	44.8 <sup>2/</sup>	42.8 ***	2.0
	00:30-00:35 HOUR	45.0 <sup>2/</sup>	44.5 ***	41.0 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:35-00:40 HOUR	43.2 <sup>2/</sup>	44.5 ***	39.2 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:40-00:45 HOUR	46.7 <sup>2/</sup>	44.5 ***	45.2 <sup>2/</sup>	42.8 ***	2.4
	00:45-00:50 HOUR	42.9 <sup>2/</sup>	44.5 ***	38.9 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:50-00:55 HOUR	48.6 <sup>2/</sup>	44.5 ***	49.6 <sup>2/</sup>	42.8 ***	6.8
	00:55-01:00 HOUR	47.1 <sup>2/</sup>	44.5 ***	47.1 <sup>2/</sup>	42.8 ***	4.3

DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดทัพพนัน				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0005	<b>NIGHT TIME <sup>2/</sup></b>					
	01:00-01:05 HOUR	47.2 <sup>2/</sup>	44.5 ***	47.2 <sup>2/</sup>	42.8 ***	4.4
	01:05-01:10 HOUR	48.6 <sup>2/</sup>	44.5 ***	49.6 <sup>2/</sup>	42.8 ***	6.8
	01:10-01:15 HOUR	48.5 <sup>2/</sup>	44.5 ***	49.5 <sup>2/</sup>	42.8 ***	6.7
	01:15-01:20 HOUR	47.4 <sup>2/</sup>	44.5 ***	47.4 <sup>2/</sup>	42.8 ***	4.6
	01:20-01:25 HOUR	47.3 <sup>2/</sup>	44.5 ***	47.3 <sup>2/</sup>	42.8 ***	4.5
	01:25-01:30 HOUR	46.8 <sup>2/</sup>	44.5 ***	45.3 <sup>2/</sup>	42.8 ***	2.5
	01:30-01:35 HOUR	46.6 <sup>2/</sup>	44.5 ***	45.1 <sup>2/</sup>	42.8 ***	2.3
	01:35-01:40 HOUR	46.9 <sup>2/</sup>	44.5 ***	45.4 <sup>2/</sup>	42.8 ***	2.6
	01:40-01:45 HOUR	49.1 <sup>2/</sup>	44.5 ***	50.6 <sup>2/</sup>	42.8 ***	7.8
	01:45-01:50 HOUR	48.2 <sup>2/</sup>	44.5 ***	49.2 <sup>2/</sup>	42.8 ***	6.4
	01:50-01:55 HOUR	49.6 <sup>2/</sup>	44.5 ***	51.1 <sup>2/</sup>	42.8 ***	8.3
	01:55-02:00 HOUR	48.2 <sup>2/</sup>	44.5 ***	49.2 <sup>2/</sup>	42.8 ***	6.4
	02:00-02:05 HOUR	48.5 <sup>2/</sup>	44.5 ***	49.5 <sup>2/</sup>	42.8 ***	6.7
	02:05-02:10 HOUR	47.7 <sup>2/</sup>	44.5 ***	47.7 <sup>2/</sup>	42.8 ***	4.9
	02:10-02:15 HOUR	47.6 <sup>2/</sup>	44.5 ***	47.6 <sup>2/</sup>	42.8 ***	4.8
	02:15-02:20 HOUR	48.8 <sup>2/</sup>	44.5 ***	49.8 <sup>2/</sup>	42.8 ***	7.0
	02:20-02:25 HOUR	49.0 <sup>2/</sup>	44.5 ***	50.5 <sup>2/</sup>	42.8 ***	7.7
	02:25-02:30 HOUR	47.4 <sup>2/</sup>	44.5 ***	47.4 <sup>2/</sup>	42.8 ***	4.6
	02:30-02:35 HOUR	46.0 <sup>2/</sup>	44.5 ***	44.5 <sup>2/</sup>	42.8 ***	1.7
	02:35-02:40 HOUR	46.3 <sup>2/</sup>	44.5 ***	44.8 <sup>2/</sup>	42.8 ***	2.0
	02:40-02:45 HOUR	45.6 <sup>2/</sup>	44.5 ***	41.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:45-02:50 HOUR	46.7 <sup>2/</sup>	44.5 ***	45.2 <sup>2/</sup>	42.8 ***	2.4
	02:50-02:55 HOUR	47.1 <sup>2/</sup>	44.5 ***	47.1 <sup>2/</sup>	42.8 ***	4.3
	02:55-03:00 HOUR	46.7 <sup>2/</sup>	44.5 ***	45.2 <sup>2/</sup>	42.8 ***	2.4
	03:00-03:05 HOUR	46.6 <sup>2/</sup>	44.5 ***	45.1 <sup>2/</sup>	42.8 ***	2.3
	03:05-03:10 HOUR	47.7 <sup>2/</sup>	44.5 ***	47.7 <sup>2/</sup>	42.8 ***	4.9
	03:10-03:15 HOUR	47.6 <sup>2/</sup>	44.5 ***	47.6 <sup>2/</sup>	42.8 ***	4.8
	03:15-03:20 HOUR	48.0 <sup>2/</sup>	44.5 ***	49.0 <sup>2/</sup>	42.8 ***	6.2
	03:20-03:25 HOUR	49.0 <sup>2/</sup>	44.5 ***	50.5 <sup>2/</sup>	42.8 ***	7.7
	03:25-03:30 HOUR	48.7 <sup>2/</sup>	44.5 ***	49.7 <sup>2/</sup>	42.8 ***	6.9
	03:30-03:35 HOUR	47.6 <sup>2/</sup>	44.5 ***	47.6 <sup>2/</sup>	42.8 ***	4.8
	03:35-03:40 HOUR	47.9 <sup>2/</sup>	44.5 ***	47.9 <sup>2/</sup>	42.8 ***	5.1
	03:40-03:45 HOUR	47.5 <sup>2/</sup>	44.5 ***	47.5 <sup>2/</sup>	42.8 ***	4.7
	03:45-03:50 HOUR	47.5 <sup>2/</sup>	44.5 ***	47.5 <sup>2/</sup>	42.8 ***	4.7
	03:50-03:55 HOUR	45.8 <sup>2/</sup>	44.5 ***	41.8 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:55-04:00 HOUR	44.8 <sup>2/</sup>	44.5 ***	40.8 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:00-04:05 HOUR	46.0 <sup>2/</sup>	44.5 ***	44.5 <sup>2/</sup>	42.8 ***	1.7
	04:05-04:10 HOUR	45.1 <sup>2/</sup>	44.5 ***	41.1 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:10-04:15 HOUR	46.8 <sup>2/</sup>	44.5 ***	45.3 <sup>2/</sup>	42.8 ***	2.5
	04:15-04:20 HOUR	46.9 <sup>2/</sup>	44.5 ***	45.4 <sup>2/</sup>	42.8 ***	2.6
	04:20-04:25 HOUR	46.0 <sup>2/</sup>	44.5 ***	44.5 <sup>2/</sup>	42.8 ***	1.7
	04:25-04:30 HOUR	46.1 <sup>2/</sup>	44.5 ***	44.6 <sup>2/</sup>	42.8 ***	1.8
	04:30-04:35 HOUR	46.8 <sup>2/</sup>	44.5 ***	45.3 <sup>2/</sup>	42.8 ***	2.5
	04:35-04:40 HOUR	44.5 <sup>2/</sup>	44.5 ***	40.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:40-04:45 HOUR	45.5 <sup>2/</sup>	44.5 ***	41.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>



DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดทัพพนัน				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0005	<b>NIGHT TIME</b> <sup>2/</sup>					
	04:45-04:50 HOUR	44.5 <sup>2/</sup>	44.5 ***	40.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:50-04:55 HOUR	43.7 <sup>2/</sup>	44.5 ***	39.7 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:55-05:00 HOUR	44.3 <sup>2/</sup>	44.5 ***	40.3 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:00-05:05 HOUR	44.6 <sup>2/</sup>	44.5 ***	40.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:05-05:10 HOUR	46.1 <sup>2/</sup>	44.5 ***	44.6 <sup>2/</sup>	42.8 ***	1.8
	05:10-05:15 HOUR	44.7 <sup>2/</sup>	44.5 ***	40.7 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:15-05:20 HOUR	43.4 <sup>2/</sup>	44.5 ***	39.4 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:20-05:25 HOUR	45.1 <sup>2/</sup>	44.5 ***	41.1 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:25-05:30 HOUR	45.6 <sup>2/</sup>	44.5 ***	41.6 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:30-05:35 HOUR	46.5 <sup>2/</sup>	44.5 ***	45.0 <sup>2/</sup>	42.8 ***	2.2
	05:35-05:40 HOUR	46.3 <sup>2/</sup>	44.5 ***	44.8 <sup>2/</sup>	42.8 ***	2.0
	05:40-05:45 HOUR	44.9 <sup>2/</sup>	44.5 ***	40.9 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:45-05:50 HOUR	45.5 <sup>2/</sup>	44.5 ***	41.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:50-05:55 HOUR	45.5 <sup>2/</sup>	44.5 ***	41.5 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:55-06:00 HOUR	44.7 <sup>2/</sup>	44.5 ***	40.7 <sup>2/</sup>	42.8 ***	NOT SIGNIFICANT <sup>3/</sup>
	<b>DAY TIME</b> <sup>1/</sup>					
	06:00-07:00 HOUR	51.1 <sup>1/</sup>	47.7 **	48.1 <sup>1/</sup>	45.3 **	2.8
MARCH 1, 2022 T22AE131-0006	<b>DAY TIME</b> <sup>1/</sup>					
	07:00-08:00 HOUR	49.8 <sup>1/</sup>	47.1 **	46.8 <sup>1/</sup>	45.0 **	1.8
	08:00-09:00 HOUR	53.1 <sup>1/</sup>	47.1 **	51.6 <sup>1/</sup>	45.0 **	6.6
	09:00-10:00 HOUR	49.2 <sup>1/</sup>	47.1 **	44.7 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	10:00-11:00 HOUR	49.5 <sup>1/</sup>	47.1 **	45.0 <sup>1/</sup>	45.0 **	0.0
	11:00-12:00 HOUR	53.5 <sup>1/</sup>	47.1 **	52.0 <sup>1/</sup>	45.0 **	7.0
	12:00-13:00 HOUR	47.1 <sup>1/</sup>	47.1 **	40.1 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	13:00-14:00 HOUR	50.6 <sup>1/</sup>	47.1 **	48.6 <sup>1/</sup>	45.0 **	3.6
	14:00-15:00 HOUR	47.5 <sup>1/</sup>	47.1 **	40.5 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	15:00-16:00 HOUR	47.6 <sup>1/</sup>	47.1 **	40.6 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	16:00-17:00 HOUR	52.0 <sup>1/</sup>	47.1 **	50.5 <sup>1/</sup>	45.0 **	5.5
	17:00-18:00 HOUR	48.9 <sup>1/</sup>	47.1 **	44.4 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	18:00-19:00 HOUR	49.1 <sup>1/</sup>	47.1 **	44.6 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	19:00-20:00 HOUR	49.2 <sup>1/</sup>	47.1 **	44.7 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	20:00-21:00 HOUR	48.4 <sup>1/</sup>	47.1 **	41.4 <sup>1/</sup>	45.0 **	NOT SIGNIFICANT <sup>3/</sup>
	21:00-22:00 HOUR	50.4 <sup>1/</sup>	47.1 **	47.4 <sup>1/</sup>	45.0 **	2.4
	<b>NIGHT TIME</b> <sup>2/</sup>					
	22:00-22:05 HOUR	45.0 <sup>2/</sup>	44.4 ***	41.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:05-22:10 HOUR	46.3 <sup>2/</sup>	44.4 ***	44.8 <sup>2/</sup>	42.6 ***	2.2
	22:10-22:15 HOUR	43.8 <sup>2/</sup>	44.4 ***	39.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:15-22:20 HOUR	44.4 <sup>2/</sup>	44.4 ***	40.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:20-22:25 HOUR	43.5 <sup>2/</sup>	44.4 ***	39.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:25-22:30 HOUR	45.3 <sup>2/</sup>	44.4 ***	41.3 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:30-22:35 HOUR	42.8 <sup>2/</sup>	44.4 ***	38.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:35-22:40 HOUR	44.7 <sup>2/</sup>	44.4 ***	40.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:40-22:45 HOUR	46.1 <sup>2/</sup>	44.4 ***	44.6 <sup>2/</sup>	42.6 ***	2.0
	22:45-22:50 HOUR	44.8 <sup>2/</sup>	44.4 ***	40.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	22:50-22:55 HOUR	43.2 <sup>2/</sup>	44.4 ***	39.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>

DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดเทพนิมิต				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 1, 2022 T22AE131-0006	<b>NIGHT TIME <sup>2/</sup></b>					
	22:55-23:00 HOUR	42.8 <sup>2/</sup>	44.4 ***	38.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:00-23:05 HOUR	43.7 <sup>2/</sup>	44.4 ***	39.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:05-23:10 HOUR	43.8 <sup>2/</sup>	44.4 ***	39.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:10-23:15 HOUR	44.9 <sup>2/</sup>	44.4 ***	40.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:15-23:20 HOUR	44.6 <sup>2/</sup>	44.4 ***	40.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:20-23:25 HOUR	41.9 <sup>2/</sup>	44.4 ***	37.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:25-23:30 HOUR	42.1 <sup>2/</sup>	44.4 ***	38.1 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:30-23:35 HOUR	43.3 <sup>2/</sup>	44.4 ***	39.3 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:35-23:40 HOUR	42.8 <sup>2/</sup>	44.4 ***	38.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:40-23:45 HOUR	43.0 <sup>2/</sup>	44.4 ***	39.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:45-23:50 HOUR	43.0 <sup>2/</sup>	44.4 ***	39.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:50-23:55 HOUR	42.3 <sup>2/</sup>	44.4 ***	38.3 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	23:55-00:00 HOUR	42.2 <sup>2/</sup>	44.4 ***	38.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
MARCH 2, 2022 T22AE131-0006	<b>NIGHT TIME <sup>2/</sup></b>					
	00:00-00:05 HOUR	40.9 <sup>2/</sup>	44.4 ***	36.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:05-00:10 HOUR	42.8 <sup>2/</sup>	44.4 ***	38.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:10-00:15 HOUR	43.9 <sup>2/</sup>	44.4 ***	39.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:15-00:20 HOUR	45.5 <sup>2/</sup>	44.4 ***	41.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:20-00:25 HOUR	42.4 <sup>2/</sup>	44.4 ***	38.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:25-00:30 HOUR	42.9 <sup>2/</sup>	44.4 ***	38.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:30-00:35 HOUR	42.5 <sup>2/</sup>	44.4 ***	38.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:35-00:40 HOUR	41.7 <sup>2/</sup>	44.4 ***	37.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:40-00:45 HOUR	42.4 <sup>2/</sup>	44.4 ***	38.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:45-00:50 HOUR	42.6 <sup>2/</sup>	44.4 ***	38.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:50-00:55 HOUR	42.0 <sup>2/</sup>	44.4 ***	38.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	00:55-01:00 HOUR	43.2 <sup>2/</sup>	44.4 ***	39.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:00-01:05 HOUR	43.0 <sup>2/</sup>	44.4 ***	39.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:05-01:10 HOUR	43.3 <sup>2/</sup>	44.4 ***	39.3 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:10-01:15 HOUR	42.7 <sup>2/</sup>	44.4 ***	38.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:15-01:20 HOUR	41.7 <sup>2/</sup>	44.4 ***	37.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:20-01:25 HOUR	44.0 <sup>2/</sup>	44.4 ***	40.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:25-01:30 HOUR	44.0 <sup>2/</sup>	44.4 ***	40.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:30-01:35 HOUR	42.7 <sup>2/</sup>	44.4 ***	38.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:35-01:40 HOUR	43.5 <sup>2/</sup>	44.4 ***	39.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:40-01:45 HOUR	42.5 <sup>2/</sup>	44.4 ***	38.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:45-01:50 HOUR	45.0 <sup>2/</sup>	44.4 ***	41.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:50-01:55 HOUR	41.8 <sup>2/</sup>	44.4 ***	37.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	01:55-02:00 HOUR	37.4 <sup>2/</sup>	44.4 ***	33.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:00-02:05 HOUR	42.5 <sup>2/</sup>	44.4 ***	38.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:05-02:10 HOUR	43.4 <sup>2/</sup>	44.4 ***	39.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:10-02:15 HOUR	38.1 <sup>2/</sup>	44.4 ***	34.1 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:15-02:20 HOUR	37.6 <sup>2/</sup>	44.4 ***	33.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:20-02:25 HOUR	42.2 <sup>2/</sup>	44.4 ***	38.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:25-02:30 HOUR	41.7 <sup>2/</sup>	44.4 ***	37.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:30-02:35 HOUR	37.6 <sup>2/</sup>	44.4 ***	33.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>

DATE	TIME*	RESULT (dB(A))				
		โรงเรียนวัดทัพพนัน				
		SPECIFIC NOISE LEVEL	RESIDUAL NOISE LEVEL	SPECIFIC NOISE LEVEL (IMPROVE NOISE LEVEL)	BACKGROUND NOISE LEVEL	ANNOYANCE NOISE LEVEL
MARCH 2, 2022 T22AE131-0006	<b>NIGHT TIME <sup>2/</sup></b>					
	02:35-02:40 HOUR	38.9 <sup>2/</sup>	44.4 ***	34.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:40-02:45 HOUR	41.0 <sup>2/</sup>	44.4 ***	37.0 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:45-02:50 HOUR	45.4 <sup>2/</sup>	44.4 ***	41.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	02:50-02:55 HOUR	46.7 <sup>2/</sup>	44.4 ***	45.2 <sup>2/</sup>	42.6 ***	2.6
	02:55-03:00 HOUR	48.1 <sup>2/</sup>	44.4 ***	49.1 <sup>2/</sup>	42.6 ***	6.5
	03:00-03:05 HOUR	48.3 <sup>2/</sup>	44.4 ***	49.3 <sup>2/</sup>	42.6 ***	6.7
	03:05-03:10 HOUR	48.6 <sup>2/</sup>	44.4 ***	49.6 <sup>2/</sup>	42.6 ***	7.0
	03:10-03:15 HOUR	47.9 <sup>2/</sup>	44.4 ***	48.9 <sup>2/</sup>	42.6 ***	6.3
	03:15-03:20 HOUR	48.0 <sup>2/</sup>	44.4 ***	49.0 <sup>2/</sup>	42.6 ***	6.4
	03:20-03:25 HOUR	48.4 <sup>2/</sup>	44.4 ***	49.4 <sup>2/</sup>	42.6 ***	6.8
	03:25-03:30 HOUR	48.3 <sup>2/</sup>	44.4 ***	49.3 <sup>2/</sup>	42.6 ***	6.7
	03:30-03:35 HOUR	48.6 <sup>2/</sup>	44.4 ***	49.6 <sup>2/</sup>	42.6 ***	7.0
	03:35-03:40 HOUR	43.2 <sup>2/</sup>	44.4 ***	39.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:40-03:45 HOUR	41.9 <sup>2/</sup>	44.4 ***	37.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:45-03:50 HOUR	42.4 <sup>2/</sup>	44.4 ***	38.4 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:50-03:55 HOUR	43.3 <sup>2/</sup>	44.4 ***	39.3 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	03:55-04:00 HOUR	46.2 <sup>2/</sup>	44.4 ***	44.7 <sup>2/</sup>	42.6 ***	2.1
	04:00-04:05 HOUR	45.6 <sup>2/</sup>	44.4 ***	41.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:05-04:10 HOUR	47.7 <sup>2/</sup>	44.4 ***	47.7 <sup>2/</sup>	42.6 ***	5.1
	04:10-04:15 HOUR	47.1 <sup>2/</sup>	44.4 ***	47.1 <sup>2/</sup>	42.6 ***	4.5
	04:15-04:20 HOUR	45.6 <sup>2/</sup>	44.4 ***	41.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:20-04:25 HOUR	46.9 <sup>2/</sup>	44.4 ***	46.9 <sup>2/</sup>	42.6 ***	4.3
	04:25-04:30 HOUR	47.3 <sup>2/</sup>	44.4 ***	47.3 <sup>2/</sup>	42.6 ***	4.7
	04:30-04:35 HOUR	46.3 <sup>2/</sup>	44.4 ***	44.8 <sup>2/</sup>	42.6 ***	2.2
	04:35-04:40 HOUR	45.7 <sup>2/</sup>	44.4 ***	41.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:40-04:45 HOUR	44.9 <sup>2/</sup>	44.4 ***	40.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:45-04:50 HOUR	45.8 <sup>2/</sup>	44.4 ***	41.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:50-04:55 HOUR	45.8 <sup>2/</sup>	44.4 ***	41.8 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	04:55-05:00 HOUR	46.8 <sup>2/</sup>	44.4 ***	45.3 <sup>2/</sup>	42.6 ***	2.7
	05:00-05:05 HOUR	46.0 <sup>2/</sup>	44.4 ***	44.5 <sup>2/</sup>	42.6 ***	1.9
	05:05-05:10 HOUR	47.9 <sup>2/</sup>	44.4 ***	48.9 <sup>2/</sup>	42.6 ***	6.3
	05:10-05:15 HOUR	46.7 <sup>2/</sup>	44.4 ***	45.2 <sup>2/</sup>	42.6 ***	2.6
	05:15-05:20 HOUR	46.2 <sup>2/</sup>	44.4 ***	44.7 <sup>2/</sup>	42.6 ***	2.1
	05:20-05:25 HOUR	44.5 <sup>2/</sup>	44.4 ***	40.5 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:25-05:30 HOUR	44.9 <sup>2/</sup>	44.4 ***	40.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:30-05:35 HOUR	43.6 <sup>2/</sup>	44.4 ***	39.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:35-05:40 HOUR	45.2 <sup>2/</sup>	44.4 ***	41.2 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:40-05:45 HOUR	44.9 <sup>2/</sup>	44.4 ***	40.9 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:45-05:50 HOUR	45.7 <sup>2/</sup>	44.4 ***	41.7 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:50-05:55 HOUR	45.6 <sup>2/</sup>	44.4 ***	41.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	05:55-06:00 HOUR	43.6 <sup>2/</sup>	44.4 ***	39.6 <sup>2/</sup>	42.6 ***	NOT SIGNIFICANT <sup>3/</sup>
	<b>DAY TIME <sup>1/</sup></b>					
	06:00-07:00 HOUR	52.4 <sup>1/</sup>	47.1 **	50.9 <sup>1/</sup>	45.0 **	5.9

- REMARK :**
- 1/ CASE 1 CALCULATION (DURING 06:00 TO 22:00 HOUR) : SPECIFIC NOISE LEVEL CONTINUOUSLY OCCUR AT LEAST 1 HOUR, MEASURING AS  $L_{Aeq}$  1 hour.
  - 2/ CASE 4 CALCULATION (DURING 22:00 TO 06:00 HOUR) : SPECIFIC NOISE LEVEL OCCUR IN RESTFUL AREA OR NIGHT TIME, MEASURING AS  $L_{Aeq}$  5 minutes.
  - 3/ NOT SIGNIFICANT MEANS ANNOYING NOISE LEVEL IS LOWER THAN 0.
  - \*\* PERCENTILE LEVEL 90 ( $L_{A90}$ ) IS MIDDLE VALUE OF 3 TIMES MEASURING.  
(15 MINUTES MEASURING DURING 06:00 TO 22:00 HOUR)  
AND RESIDUAL NOISE LEVEL ( $L_{Aeq}$  5 minutes) IS CHOSE AT THE SAME TIME AS PERCENTILE LEVEL 90 ABOVE.
  - \*\*\* PERCENTILE LEVEL 90 ( $L_{A90}$ ) IS MIDDLE VALUE OF 3 TIMES MEASURING.  
(15 MINUTES MEASURING DURING 22:00 TO 06:00 HOUR)  
AND RESIDUAL NOISE LEVEL ( $L_{Aeq}$  5 minutes) IS CHOSE AT THE SAME TIME AS PERCENTILE LEVEL 90 ABOVE.

.....  
(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTRICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING PLACE** : บ้านศิลาทอง  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022 **ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \* **REPORT NO.** : 2022-U020003  
**MEASURING METHOD** : CHEMILUMINESCENCE **WORK NO.** : 2022-000024  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET **ANALYSIS NO.** : T22AE130-0001 - T22AE130-0003

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	บ้านศิลาทอง		
	FEBRUARY 27-28, 2022 T22AE130-0001	FEBRUARY 28 - MARCH 1, 2022 T22AE130-0002	MARCH 1-2, 2022 T22AE130-0003
07:00-08:00 HOUR	0.0296	0.0302	0.0272
08:00-09:00 HOUR	0.0295	0.0282	0.0288
09:00-10:00 HOUR	0.0281	0.0302	0.0307
10:00-11:00 HOUR	0.0284	0.0269	0.0301
11:00-12:00 HOUR	0.0281	0.0266	0.0276
12:00-13:00 HOUR	0.0308	0.0299	0.0268
13:00-14:00 HOUR	0.0262	0.0265	0.0286
14:00-15:00 HOUR	0.0282	0.0289	0.0286
15:00-16:00 HOUR	0.0274	0.0273	0.0311
16:00-17:00 HOUR	0.0264	0.0290	0.0302
17:00-18:00 HOUR	0.0254	0.0306	0.0266
18:00-19:00 HOUR	0.0231	0.0292	0.0288
19:00-20:00 HOUR	0.0243	0.0286	0.0281
20:00-21:00 HOUR	0.0265	0.0275	0.0262
21:00-22:00 HOUR	0.0248	0.0265	0.0252
22:00-23:00 HOUR	0.0245	0.0238	0.0248
23:00-00:00 HOUR	0.0261	0.0241	0.0255
00:00-01:00 HOUR	0.0250	0.0248	0.0240
01:00-02:00 HOUR	0.0246	0.0244	0.0235
02:00-03:00 HOUR	0.0254	0.0243	0.0261
03:00-04:00 HOUR	0.0271	0.0230	0.0221
04:00-05:00 HOUR	0.0279	0.0253	0.0266
05:00-06:00 HOUR	0.0277	0.0268	0.0260
06:00-07:00 HOUR	0.0298	0.0270	0.0280

(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022





## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING PLACE** : โรงเรียนวัดทัพพนัน  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022 **ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \* **REPORT NO.** : 2022-U020004  
**MEASURING METHOD** : CHEMILUMINESCENCE **WORK NO.** : 2022-000024  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET **ANALYSIS NO.** : T22AE130-0004 - T22AE130-0006

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	โรงเรียนวัดทัพพนัน		
	FEBRUARY 27-28, 2022 T22AE130-0004	FEBRUARY 28 - MARCH 1, 2022 T22AE130-0005	MARCH 1-2, 2022 T22AE130-0006
07:00-08:00 HOUR	0.0285	0.0273	0.0265
08:00-09:00 HOUR	0.0285	0.0268	0.0281
09:00-10:00 HOUR	0.0277	0.0264	0.0275
10:00-11:00 HOUR	0.0256	0.0268	0.0286
11:00-12:00 HOUR	0.0258	0.0263	0.0282
12:00-13:00 HOUR	0.0262	0.0262	0.0255
13:00-14:00 HOUR	0.0273	0.0258	0.0271
14:00-15:00 HOUR	0.0254	0.0275	0.0269
15:00-16:00 HOUR	0.0268	0.0284	0.0268
16:00-17:00 HOUR	0.0278	0.0268	0.0274
17:00-18:00 HOUR	0.0286	0.0286	0.0262
18:00-19:00 HOUR	0.0268	0.0273	0.0271
19:00-20:00 HOUR	0.0266	0.0263	0.0284
20:00-21:00 HOUR	0.0249	0.0262	0.0269
21:00-22:00 HOUR	0.0265	0.0259	0.0271
22:00-23:00 HOUR	0.0250	0.0233	0.0281
23:00-00:00 HOUR	0.0234	0.0252	0.0269
00:00-01:00 HOUR	0.0237	0.0241	0.0254
01:00-02:00 HOUR	0.0241	0.0256	0.0249
02:00-03:00 HOUR	0.0245	0.0254	0.0243
03:00-04:00 HOUR	0.0267	0.0236	0.0269
04:00-05:00 HOUR	0.0265	0.0260	0.0237
05:00-06:00 HOUR	0.0274	0.0273	0.0244
06:00-07:00 HOUR	0.0283	0.0271	0.0243

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTTICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**MEASURING PLACE** : บ้านศิลาทอง  
**MEASURING TYPE** : AMBIENT (AIR)  
**MEASURING DATE** : FEBRUARY 27 - MARCH 2, 2022  
**MEASURING TIME** : \*  
**MEASURING METHOD** : WIND SPEED & WIND DIRECTION EQUIPMENT  
**MEASURED BY** : MR SIRAPAT JONGPHADUNGKIET  
**RECEIVED DATE** : FEBRUARY 27 - MARCH 2, 2022  
**ANALYTICAL DATE** : FEBRUARY 27 - MARCH 2, 2022  
**REPORT NO.** : 2022-U020005  
**WORK NO.** : 2022-000024  
**ANALYSIS NO.** : T22AE130-0001 - T22AE130-0003

TIME *	RESULT (m/s)					
	บ้านศิลาทอง					
	FEBRUARY 27-28, 2022 T22AE130-0001		FEBRUARY 28 - MARCH 1, 2022 T22AE130-0002		MARCH 1-2, 2022 T22AE130-0003	
	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION
07:00-08:00 HOUR	0.5	SSW	2.6	SW	1.1	NE
08:00-09:00 HOUR	1.6	W	1.5	SW	2.6	NNE
09:00-10:00 HOUR	2.3	WSW	0.9	SSW	2.0	NNE
10:00-11:00 HOUR	2.9	W	0.4	WSW	0.5	ENE
11:00-12:00 HOUR	2.7	WSW	1.3	SW	2.0	NE
12:00-13:00 HOUR	1.7	SSW	0.5	W	1.8	NNE
13:00-14:00 HOUR	2.6	WSW	0.3	WSW	2.8	NE
14:00-15:00 HOUR	2.0	SSW	0.6	WSW	3.0	NNE
15:00-16:00 HOUR	1.7	W	1.9	SW	2.6	NE
16:00-17:00 HOUR	1.4	SSW	1.7	WSW	0.4	NNE
17:00-18:00 HOUR	2.4	SSW	0.8	SSW	1.6	NE
18:00-19:00 HOUR	1.3	WSW	2.5	WSW	3.3	NE
19:00-20:00 HOUR	0.7	SSW	0.4	SW	3.1	NNE
20:00-21:00 HOUR	2.7	SW	0.6	SW	0.3	ENE
21:00-22:00 HOUR	0.4	SSW	1.6	WSW	2.8	ENE
22:00-23:00 HOUR	2.7	SW	1.8	WSW	3.1	E
23:00-00:00 HOUR	0.8	SW	0.4	WNW	2.8	ESE
00:00-01:00 HOUR	0.6	W	0.6	WNW	1.7	SSE
01:00-02:00 HOUR	2.1	W	2.6	NW	2.4	SSE
02:00-03:00 HOUR	1.8	SW	0.7	NW	3.3	S
03:00-04:00 HOUR	0.7	SSW	0.5	NNW	1.1	SSW
04:00-05:00 HOUR	0.8	SSW	2.0	N	3.2	SW
05:00-06:00 HOUR	1.1	WSW	2.7	NE	1.9	WSW
06:00-07:00 HOUR	3.3	SSW	2.1	ENE	2.8	WSW

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

JUNE 1, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : BANRAI ELECTRICITY GENERATING COMPANY LIMITED  
**ADDRESS** : 111 MOO. 12 THAP LUANG BAN RAI UTHAI THANI 61140  
**CONTACT INFORMATION** : TEL : 09 5992 6395 e-mail : Safetytherasak@hotmail.com  
**SAMPLING SOURCE** : -  
**SAMPLE TYPE** : WASTEWATER  
**SAMPLING DATE** : FEBRUARY 2, 2022  
**SAMPLING TIME** : 1/  
**SAMPLING METHOD** <sup>c</sup> : GRAB  
**SAMPLING BY** <sup>c</sup> : MR SUKSAN BOONLEANG ๖-145-๖-0055  
**ANALYZED BY** : MISS KALLAYA SOMPHONG ๖-145-๖-0007

**RECEIVED DATE** : FEBRUARY 3, 2022  
**ANALYTICAL DATE** : FEBRUARY 3-10, 2022  
**REPORT NO.** : 2022-U010795  
**WORK NO.** : 2022-000024  
**ANALYSIS NO.** : T22AB865-0001 - T22AB865-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 13:50 HOUR 1/ T22AB865-0001	2 14:20 HOUR 1/ T22AB865-0002		
pH <sup>c</sup>	-	ELECTROMETRIC METHOD AT SITE (SM: 4500-H* B)	8.2 (30°C)	8.8 (30°C)	5.5-9.0	-
TEMPERATURE <sup>c</sup>	°C	LABORATORY AND FIELD METHODS (SM: 2550 B)	30	30	≤ 40	-
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	5-DAY BOD TEST, MEMBRANE ELECTRODE METHOD (SM: 5210 B AND 4500-O G)	ND	6.8	≤ 20	2.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	DRIED AT 180 °C (SM: 2540 C)	472	824	≤ 3,000	25
TOTAL SUSPENDED SOLIDS <sup>c</sup>	mg/L	DRIED AT 103-105 °C (SM: 2540 D)	21.8	14.9	≤ 50	5.0
FAT, OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	ND	≤ 5	3
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN	GREEN/TURBID GREEN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

RESULT 1 : จุดบอกรวมรณน้ำทงก่อนเข้ระบบบนำบด

RESULT 2 : บ่อบนำบดน้ำเสียบบ่อสุดท้าย

REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

(MRS PIYAPAT SUTTAMANUTWONG)  
LABORATORY SUPERVISOR  
๖-145-๖-0004  
FEBRUARY 15, 2022



ภาคผนวก ข-2

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เอกสารขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

### List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Stack</b>									
1	Pre-Test Console	Total Suspended Particulate Copper Total Hydrocarbons	Apex Instruments, USA.	XC-572-V 0807048	Envi Equipment Service Co., Ltd.	E21-0821	2 Sep 21	1 Sep 22	-
2	Flue gas Analyzer	Sulphur Dioxide Oxide of Nitrogen as Nitrogen Dioxide Carbon Monoxide	Testo	Testo 350 60899456	Entech Industrial Solution Co., Ltd.	G 640441	5 Aug 21	4 Aug 22	-

### List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Ambient</b>									
1	Orifice Transfer Standard Calibrator	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Tisch Environmental, Inc.	TE-5025A 3383	Tisch Environmental, Inc.	27072020	27 Jul 20	26 Jul 22	-
2	U-Tube Manometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Dwyer	1221-36-W/M -	Technology Promotion Association (Thailand-Japan)	22P800	12 Mar 22	11 Mar 23	-
3	Aneroid Barometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	21P2500	21 Jul 21	20 Jul 22	-
4	Dial Thermo-Hygrometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	22H771	5 Apr 22	4 Apr 23	-
5	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1201778108	UAE Consultant Co., Ltd.	08122021	8 Dec 21	7 Dec 22	-
6	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1201778109	UAE Consultant Co., Ltd.	08122021	8 Dec 21	7 Dec 22	-
7	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1201778105	UAE Consultant Co., Ltd.	17112021	17 Nov 21	16 Nov 22	-
8	Standard Gases (Mixture)	Nitrogen Dioxide	Airgas	CC159599 2015PSIG	Airgas an Air Liquide company	E04N99E15A01QC	30 Jul 19	30 Jul 22	-
9	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1201497730	UAE Consultant Co., Ltd.	30112021	30 Nov 21	29 Nov 22	-
10	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1201497732	UAE Consultant Co., Ltd.	30112021	30 Nov 21	29 Nov 22	-
11	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1201497733	UAE Consultant Co., Ltd.	30112021	30 Nov 21	29 Nov 22	-
12	Standard Gases (Mixture)	Carbon Monoxide	Airgas	CC159599 2015PSIG	Airgas an Air Liquide company	160-401526192-1	30 Jul 19	30 Jul 22	-



### List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Ambient</b>									
13	Wind Speed/Wind Direction	WS/WD	LSI LASTEM	E-LOG305 19040308	Thai Meteorological Department	385/21	16 Aug 21	15 Aug 22	-
14	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Larson Davis	CAL150 6171	Innovative Instrument Co.,Ltd.	21-ACT-327	24 Aug 21	23 Aug 22	-
15	Sound Level Meter	$L_{Aeq\ 24\ hr}$ $L_{A90}$ $L_{Adiv}$ $L_{Amax}$	Larson Davis	LxT2 0005286	Sithiporn Associates Co., Ltd.	ACL22081	25 Jan 22	24 Jan 23	-
16	Sound Level Meter	$L_{Aeq\ 24\ hr}$ $L_{A90}$ $L_{Adiv}$ $L_{Amax}$	Larson Davis	LxT2 0005394	Innovative Instrument Co.,Ltd.	22-ACT-034	21 Jan 22	20 Jan 23	-
17	Sound Level Meter	$L_{Aeq\ 24\ hr}$ $L_{A90}$ $L_{Adiv}$ $L_{Amax}$	Larson Davis	LxT2 0005286	Sithiporn Associates Co., Ltd.	ACL22081	25 Jan 22	24 Jan 23	-
18	Sound Level Meter	$L_{Aeq\ 24\ hours}$ $L_{Adiv}$ $L_{A90}$ $L_{Amax}$	Larson Davis	LxT2 0006614	Innovative Instrument Co.,Ltd.	22-ACT-104	11 Feb 22	10 Feb 23	-
19	Sound Level Meter	$L_{Aeq\ 24\ hr}$ $L_{A90}$ $L_{Adiv}$ $L_{Amax}$	Larson Davis	LxT2 0005396	Innovative Instrument Co.,Ltd.	22-ACT-105	11 Feb 22	10 Feb 23	-

### List of Instruments Certification for Water Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Water</b>									
1	pH Meter	pH	Horiba	LAQUA-PH210 HA1F0002	Technology Promotion Association (Thailand-Japan)	21CH1607	19 Nov 21	18 Nov 22	-

Enviro-Service Co., Ltd.

110254 Moo 3, Tambon Bang Rak Phatthana, Amphur Bang Bua Thong, Nonthaburi 11110  
Tel. 098 362 9152, 089 478 7885  
E-mail: sales@enviro-service.com

Certificate No. : E21-0821  
Page : 1 of 6

## CERTIFICATE OF CALIBRATION

**Customer** United Analyst and Engineering Consultant Co., Ltd.  
**Address** 81 Soi Udomsak 41, Sukhumvit Road, Bangchak, Phrakhumong, Bangkok 10260  
**Description of Equipment** Console meter  
**Manufacturer** Apex Instrument  
**Model Number** XC-S72-V  
**Serial Number** 0807048  
**ID./Control No.** :  
**Environment Conditions** Temperature (25 ± 2) °C  
Humidity (50 ± 15) % RH  
**Cal. Date** 02/09/2021  
**Issue Date** 02/09/2021

### Calibration Method or Calibration Procedure Used

ISI PA Method of United State Environmental Protection Agency

This certificate is traceable to national standard, which realize the units of measurement according to the International System of Units (SI).

### Result of Calibration

This certificate may not be reproduced other than in full except with prior Written approval of the Technical Manager, Enviro-Service Co., Ltd.

\*These reported uncertainties of measurement are expanded by a coverage factor of k = 2, providing a 95% confidence level



เอกสารไม่ควบคุม

### List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Workplace</b>									
1	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Svantek	SV35A 73249	Innovative Instrument Co.,Ltd.	21-ACT-187	28 May 21	27 May 22	-
2	Sound Level Meter	$L_{Aeq, 8 \text{ hours}}$ $L_{Amax}$	Rion, Japan	NL-42 00409050	Innovative Instrument Co.,Ltd.	22-ACT-067	3 Feb 22	2 Feb 23	-
3	Sound Level Meter	$L_{Aeq, 8 \text{ hours}}$ $L_{Amax}$	Rion, Japan	NL-42 00709682	Sithiporn Associates Co., Ltd.	ACL22075	25 Jan 22	24 Jan 23	-
4	Sound Level Meter	$L_{Aeq, 8 \text{ hours}}$ $L_{Amax}$	Larson Davis	LxT2 0005400	Innovative Instrument Co.,Ltd.	22-ACT-036	21 Jan 22	20 Jan 23	-
5	Sound Level Meter	$L_{Aeq, 8 \text{ hours}}$ $L_{Amax}$	Larson Davis	LxT2 0005402	Innovative Instrument Co.,Ltd.	22-ACT-103	11 Feb 22	10 Feb 23	-
6	Sound Level Meter	$L_{Aeq, 8 \text{ hours}}$ $L_{Amax}$	Larson Davis	LxT2 0006614	Innovative Instrument Co.,Ltd.	22-ACT-104	11 Feb 22	10 Feb 23	-
7	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 67627	Innovative Instrument Co.,Ltd.	21-ACT-361	20 Sep 21	19 Sep 22	-
8	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104 91923	Innovative Instrument Co.,Ltd.	22-ACT-114	17 Feb 22	16 Feb 23	-
9	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104 91925	Innovative Instrument Co.,Ltd.	22-ACT-033	21 Jan 22	20 Jan 23	-
10	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Svantek	SV36 107224	Innovative Instrument Co.,Ltd.	21-ACT-326	24 Aug 21	23 Aug 22	-

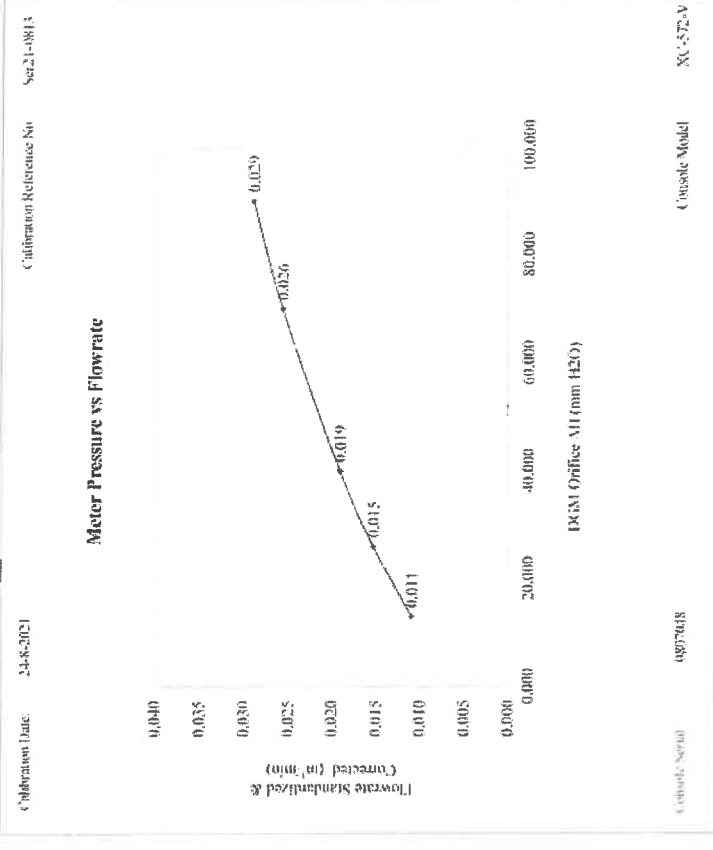
METHOD 5 CONSOLE CALIBRATION  
USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425  
5-POINT METRIC UNIT

METHOD 5 CONSOLE CALIBRATION  
USING REFERENCE WET GAS METER W-NK-2.5-B-Z No.547425  
5-POINT METRIC UNIT

Meter Console Information				Calibration Data			
Console Model Number	XC-572-V	Date	02/09/2021	Std Temp	293	K	
Console Serial Number	0807048	Calibration Reference No.		Std Press	760	mm Hg	
DGM Model Number	SK25FX	Barometric Pressure	761.00	K	0.386		
DGM Serial Number	00003811	Calibration Meter Gamma	0.999	Console Leak Check			
							PASS

Calibration Data Results									
Standardized Data					Dry Gas Meter				
Dry Gas Meter (V <sub>std</sub> )	m <sup>3</sup>	m <sup>3</sup> /min	Calibration Meter (Q <sub>wet</sub> )	m <sup>3</sup> /min	Calibration Factor		Flowrate		Variation (ΔH <sub>sc</sub> )
					Value (Y)	Variation (ΔY)	Std & Corr (Q <sub>std,corr</sub> )	mm H <sub>2</sub> O	
0.138	0.01	0.134	0.011	0.011	0.970	0.006	0.011	48.392	-0.204
0.138	0.01	0.134	0.011	0.011	0.969	0.004	0.011	48.583	0.052
0.139	0.016	0.135	0.015	0.015	0.971	0.006	0.015	49.596	0.758
0.139	0.016	0.135	0.016	0.016	0.971	0.007	0.016	47.409	-1.298
0.270	0.020	0.271	0.019	0.019	0.974	0.010	0.019	46.084	0.486
0.270	0.020	0.270	0.019	0.019	0.970	0.008	0.019	46.231	0.072
0.280	0.027	0.269	0.026	0.026	0.961	-0.004	0.026	47.096	-0.962
0.279	0.027	0.268	0.026	0.026	0.958	0.006	0.026	48.001	-0.494
0.280	0.030	0.266	0.029	0.029	0.981	-0.011	0.029	48.418	-0.180
0.280	0.031	0.265	0.029	0.029	0.948	0.016	0.029	48.614	0.016
					0.965	Y Average		48.598	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is ±0.02.  
For ΔH<sub>sc</sub>, orifice pressure differential that equates to 0.75 cfm (0.0212 m<sup>3</sup>/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is ±0.2 inches (5.1mm) H<sub>2</sub>O.



## THERMOCOUPLES SYSTEM CALIBRATION

Sampling System		Calibration Certificate	
Console Model Number	XC-572-V	Date	02-09-2021 03:30 PM
Console Serial Number	0807048	Calibration Reference No.	
DGM Model Number	SK25EX	Reference Thermometer	DIGICON
DGM Serial Number	00003811	Serial Number	183169105
Meter Box Model Number	JENCO 765 KF		
Meter Box Serial Number	JC 08944		

Console Thermocouple Simulator									
Channel and test point		Meter Box Channel Temperature Reading (°C)							
Stick	-18.0	25.0	38.0	149.0	260.0	371.0	482.0	593.0	816.0 1038.0
	17.0	26.0	39.0	150.0	261.0	372.0	483.0	594.0	1039.0
Stick	17.0	26.0	39.0	150.0					
Probe	-17.0	26.0	39.0	150.0					
Filter	-17.0	26.0	39.0	150.0					
Oven									
Exit	-17.0	26.0	39.0						

Stick = 1.50% Absolute  
Probe = 3.0 °C  
Filter = 3.0 °C

### Tolerance Range

Meter Exit  
3.0 °C  
2.0 °C

Instrument description : Flue gas Analyzer  
Instrument model : Testo 350 New  
Instrument serial no. : 60899456  
ID no. or control no. : UAE-EPM.005/2560  
Manufacturer : testo SE  
Probe description :  
Probe model :  
Customer name : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Customer address : 81 SOI UDOMSUK41, SUKHUMVIT ROAD, BANGCHAK FRANKING BANGKOK 10260  
Total pages of certificate : 2 Pages  
Receiving no. : 1-211963  
Receiving date. : 14-Jul-21  
Parameter of calibration : Gas Calibration(Oxygen 2.50L,10.00,21.00 %vol, Carbon Monoxide 80.73,309.9,1003 ppm, Nitric Oxide 10.08,150.9,320.6 ppm), Sulphur Dioxide 50.04,100.9,601.1 ppm, Nitrogen Dioxide 10.20,80.62,202.2 ppm)  
Condition of UUC. : Used  
Ambient condition : All of the Measurement were carried out the stabilized laboratory  
Temperature : 23 ±5 °C  
Humidity : 55 ± 15 %RH  
Calibration place : 17/121 Soi Ngarnwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210  
Calibration procedure no. : WI-CL-28-C

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

Date of calibration : 04-Aug-21



Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen ( O <sub>2</sub> ) 2.501 % Vol	2453/19	Linde	16-Jul-23
Oxygen ( O <sub>2</sub> ) 10.00 % Vol	2453/19	Linde	18-Jul-23
Oxygen ( O <sub>2</sub> ) 21.00 % Vol	2453/19	Linde	16-Jul-23
Carbon monoxide ( CO ) 80.97 ppm	2842/21	Linde	24-Jun-23
Carbon monoxide ( CO ) 309.9 ppm	2803/21	Linde	22-Jun-23
Carbon monoxide ( CO ) 1003 ppm	2829/21	Linde	23-Apr-23
Nitric Oxide ( NO ) 10.08 ppm	3241/21	Linde	25-Jun-23
Nitric Oxide ( NO ) 150.9 ppm	2857/21	Linde	27-Jun-23
Nitric Oxide ( NO ) 320.6 ppm	2944/21	Linde	02-Jul-23
Sulphur Dioxide ( SO <sub>2</sub> ) 50.04 ppm	3205/21	Linde	25-Jul-23
Sulphur Dioxide ( SO <sub>2</sub> ) 100.9 ppm	4942/20	Linde	20-Nov-22
Sulphur Dioxide ( SO <sub>2</sub> ) 601.1 ppm	3204/21	Linde	20-Jul-23
Nitrogen Dioxide ( NO <sub>2</sub> ) 10.20 ppm	2929/19	Linde	27-Aug-21
Nitrogen Dioxide ( NO <sub>2</sub> ) 80.62 ppm	3240/21	Linde	25-Jul-23
Nitrogen Dioxide ( NO <sub>2</sub> ) 202.2 ppm	3239/21	Linde	20-Jul-23

Measured room conditions

Temperature : 23.2 °C Humidity : 53.8 %RH Pressure : 1016.3 mbar  
 Calibration conditions  
 Gas Temperature : 23 °C Flow rate : 1,100 ml/min Gas pressure : 1021.6 mbar

Calibration Results (without adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O <sub>2</sub> (%Vol)	2.501	2.47	-0.031	0.20
O <sub>2</sub> (%Vol)	10.00	9.86	-0.14	0.40
O <sub>2</sub> (%Vol)	21.00	21.14	0.14	0.80
CO (ppm)	80.97	82	1.03	2.8
CO (ppm)	309.9	310	0.1	11
CO (ppm)	1003	999	-4	34
NO (ppm)	10.08	9	-1.08	3.0
NO (ppm)	150.9	151	0.1	5.0
NO (ppm)	320.6	322	1.4	10
SO <sub>2</sub> (ppm)	50.04	49	-1.04	5.0
SO <sub>2</sub> (ppm)	100.9	101	0.1	5.0
SO <sub>2</sub> (ppm)	601.1	599	-2.1	14
NO <sub>2</sub> (ppm)	10.20	9.9	-0.30	1.5
NO <sub>2</sub> (ppm)	80.62	80.3	-0.32	5.0
NO <sub>2</sub> (ppm)	202.2	198.9	-3.3	5.0

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

End of Report



Certificate of Calibration

Calibration Certification Information

Cal. Date: July 27, 2020 Rootsmeier S/N: 438320 Ta: 298 °K  
 Operator: Jim Tisch Pa: 749.3 mm Hg  
 Calibration Model #: TE-5025A Callibrator S/N: 3383

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H <sub>2</sub> O)
1	1	2	1	1.4020	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8920	7.8	5.00
4	7	8	1	0.8430	8.7	5.50
5	9	10	1	0.7010	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (m3)	ΔH (Pa - Pstd) (Pa)	Va (m3)	Qa (m3)	ΔH (Ta/Pa) (Pa)
0.9817	0.7002	1.4042	0.9957	0.7102	0.8919
0.9776	0.9776	1.9859	0.9916	0.9916	1.2613
0.9757	1.0938	2.2203	0.9896	1.1094	1.4101
0.9745	1.1560	2.3286	0.9884	1.1725	1.4790
0.9692	1.3826	2.8084	0.9831	1.4024	1.7837
QSTD	m= 2.04993		QA	m= 1.28363	
	b= -0.02762			b= -0.01754	
	r= 0.99985			r= 0.99985	

Calculations

Vstd=ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=ΔVol((Pa-ΔP)/Pa)
Qstd=Vstd/ΔTime	Qa=Va/ΔTime
Qstd= 1/m (ΔH (Pa - Pstd) (Tstd/Ta))	Qa= 1/m (ΔH (Ta/Pa) (Pa - b))

Standard Conditions

Tstd: 298.15 °K	Key
Pstd: 760 mm Hg	ΔH: callibrator manometer reading (in H <sub>2</sub> O)
	ΔP: rootsmeier manometer reading (mm Hg)
	Ta: actual absolute temperature (°K)
	Pa: actual barometric pressure (mm Hg)
	b: intercept
	m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix 8 to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
53-54 PATTANAKARN ROAD SOI 18, SEANLIANG, SUANLIANG, BANGKOK 10250  
TEL. 0-2717-3000-24 FAX. 0-2719-9184

## Certificate of Calibration

Certificate No.: 22P800  
Page: 1 of 2

Equipment: U-Tube Manometer  
Manufacturer: Dwyer  
Model: 1221-3E-W/M  
Serial No.:  
ID No.: UAE.EFM.022/2560  
Condition As-Received: Used Item  
Received Date: 03 March 2022  
Calibration Date: 12 March 2022  
Reference: 2203-0131WSC  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Atmospheric Pressure: 1010 mbar

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: United Analyst and Engineering Consultant Co., Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road, Bangkok.  
Phraekhanong, Bangkok 10260

Procedure used: The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to In-house calibration procedure CP-P04, using "DKD-R 6-1 : Calibration of Pressure Gauges, Edition 03/2014." as a guidelines.

Condition of this result of calibration

1. Reference standards instruments :

Instrument Model Serial No. Certificate No. Due Date

1) Pressure Calibrator PC10SP 1189 MP-0110-21 09 Aug 2022

2. This result of calibration was made on requested at the point specified by customer.

3. Scale and conversion factor is 1 kPa = 4.0146293 inH<sub>2</sub>O

4. This instrument was used clean air as pressure media.

5. This instrument was calibrated by applied pressure to high-port (+) side and low-port (-) side open to atmospheric pressure.

6. This instrument was installed in vertical orientation and top of the pressure port was used as the reference level.

7. The certificate is valid only to the item calibrated on date and place of calibration.

8. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)



Cert.No.: 22P800  
Page: 2 of 2

Result of calibration:- Without adjustment  
Function:- Pressure Measurement  
Increasing Pressure

Range: 0 inH<sub>2</sub>O to 35 inH<sub>2</sub>O  
Scale Interval: 0.1 inH<sub>2</sub>O (The Fifth Estimate)

Applied Pressure (inH <sub>2</sub> O)	UUC Indication		AP (inH <sub>2</sub> O)	Error (inH <sub>2</sub> O)
	High-port side (inH <sub>2</sub> O)	Low-port side (inH <sub>2</sub> O)		
0.00	0.00	0.00	0.00	0.00
2.00	1.00	-1.00	2.00	0.00
4.00	2.00	-2.00	4.00	0.00
6.00	3.00	-3.00	6.00	0.00
8.00	4.00	-4.00	8.00	0.00
10.00	5.00	-5.02	10.02	0.02
12.00	6.00	-6.02	12.02	0.02
14.00	7.00	-7.04	14.04	0.04
16.00	8.00	-8.04	16.04	0.04
18.00	9.00	-9.04	18.04	0.04
20.00	10.00	-10.04	20.04	0.04
22.00	11.00	-11.02	22.02	0.02
24.00	12.00	-12.02	24.02	0.02
26.00	13.00	-13.02	26.02	0.02
28.00	14.00	-14.04	28.04	0.04
30.00	15.00	-15.04	30.04	0.04
32.00	16.00	-16.04	32.04	0.04
34.00	18.98	-17.08	34.04	0.04
35.80	17.98	-18.00	35.98	0.18

The uncertainty of measurement was ± 0.11 inH<sub>2</sub>O

\* UUC = Unit Under Calibration

\* AP = High-port side - Low-port side

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLIANG, BANGKOK 10250  
TEL. 0-2717-3000-24 FAX. 0-271 9-0484



## Certificate of Calibration

Certificate No. : 21P2500

Page : 1 of 2

Equipment : Aneroid Barometer  
Manufacturer : Barigo  
Model : -  
Serial No. : -  
ID No. : UAE-ANV.123/2550  
Condition As-Received: Used Item  
Received Date: 20 July 2021  
Calibration Date: 21 July 2021

Submitted by: United Analyst and Engineering Consultant Co.,Ltd.

Reference: 2107-0570WSC  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Atmospheric Pressure: 1009 mbar

Procedure used: The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to in-house calibration procedure CP-P10, using " DKD-R 6-1 ; Calibration of Pressure Gauges, Edition 03/2014 " as a guidelines.

### Condition of this result of calibration

1. Reference standards instruments :

Instrument

Model

Serial No.

Certificate No.

Due Date

1) Standard Barometer

DPI142

1422505046

MP-0053-21

08 Apr 2022

2. This instrument was installed in vertical orientation and center of the dial was used as the reference level.

3. This result of calibration was made on requested at the point specified by customer.

4. This instrument was used clean air as pressure media.

5. The certificate is valid only to the item calibrated on date and place of calibration.

6. This Certification is traceable to the International System of Unit maintained at-

-National Institute of Metrology Thailand (NIMTT)



Cert.No.: 21P2500  
Page: 2 of 2

Result of calibration:- Without adjustment  
Function:- Absolute Pressure Measurement  
Scale Interval: 1 hPa (The Fifth Estimate )  
Range: 960 hPa to 1030 hPa

Increasing Pressure	Applied Pressure (hPa)	956.38	966.61	976.40	986.51	1000.62	1010.72	1020.76	1031.19
UUC* Indication (hPa)	960.0	970.0	980.0	990.0	1000.0	1010.0	1020.0	1030.0	
Error (hPa)	3.64	1.39	0.60	-0.51	-0.62	-0.72	-0.76	-1.19	

### Decreasing Pressure

Applied Pressure (hPa)	1031.28	1020.72	1010.67	1000.58	990.42	979.33	968.54	956.29	
UUC* Indication (hPa)	1030.0	1020.0	1010.0	1000.0	990.0	980.0	970.0	960.0	
Error (hPa)	-1.28	-0.72	-0.67	-0.58	-0.42	-0.67	-1.46	3.71	

The uncertainty of measurement was ± 0.30 hPa

\* UUC = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250

TEL 0-2717-3086-24 FAX 0-2719-9484



## Certificate of Calibration

Certificate No.: 22H771  
Page: 1 of 2

Equipment: Dial Thermo-Hygrometer  
Manufacturer: Baigo  
Model: -  
Serial No.: -  
ID No.: UAE ANV.003/2548  
Condition As-Received: Used Item  
Received Date: 30 March 2022  
Calibration Date: 01 April 2022  
Reference: to 05 April 2022  
2203-1124WSC  
Ambient Temperature: { 25 ± 3 } °C  
Relative Humidity: { 50 ± 20 } %

This certificate may not be reproduced either then in full,  
except with the prior written approval of the head of  
Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: United Analyst and Engineering Consultant Co., Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road, Bangkok,  
Phrakhanong, Bangkok 10260

Procedure used: Calibration was conducted using in-house calibration procedure CP-H02 according to comparison  
with standard chilled mirror sensor for humidity measurement function and comparison with standard  
temperature probe for temperature measurement function into humidity / temperature chamber.

### Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard Chilled Mirror Hygrometer Sensor	Dew Prime II	31863	19714	17 Sep 2022
2) Standard Humidity/Temperature Meter	400	10203027	TH-00653-21	01 Jul 2022

2. The certificate is valid only to the item calibrated on date and place of calibration.

3. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Standards and Technology (NIST), The United States of America

-National Institute of Metrology (NIMT)



Cert. No.: 22H771  
Page: 2 of 2

Result of Calibration:-			
Function:			
Reference Temperature (°C)	Humidity measurement		Uncertainty of Measurement (±%R.H.)
	Standard Humidity (%R.H.)	Without Adjustment UUC* Reading (%R.H.)	
25.0	40.1	42	1.9
25.0	60.0	61	1.8
25.0	80.0	78	2.0

Result of Calibration:-			
Function:			
Standard Temperature (°C)	Temperature measurement		Uncertainty of Measurement (±°C)
	Without Adjustment UUC* Reading (°C)	Error (°C)	
20.02	20.0	-0.02	0.72
28.98	30.0	0.02	0.72
35.02	35.0	-0.02	0.72
40.03	40.0	-0.03	0.72

UUC\* : Unit Under Calibration

The reported uncertainty of measurement was based on standard uncertainty multiplied  
by coverage factor k = 2.00, providing confidence level approximately 95%.

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

MULTI-POINT GAS TEST REPORT

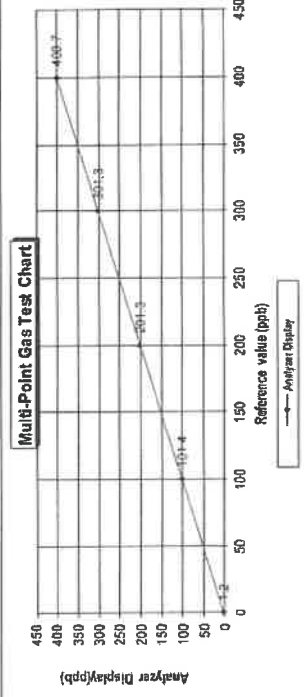
Test Date : Dec 8, 2021

Equipment : Gas Analyzer (NO<sub>2</sub>) Model : 421  
Manufacturer : Thermo Scientific Serial Number : 1201778108

Standard Gas Concentration  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM Thermo Scientific  
Nitric Oxide (NO) 45.35 PPM 1461  
Methane (CH<sub>4</sub>) - PPM 1180540071  
Carbon Monoxide (CO) 1007  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	% Error
Level 1	Zero	0.0	1.20	1.20	1.20
Level 2	20.00%	101.4	1.40	1.38	1.38
Level 3	40.00%	201.3	1.30	0.65	0.65
Level 4	60.00%	301.3	1.30	0.43	0.43
Level 5	80.00%	400.7	0.70	0.17	0.17
Remark : Measuring Range 500.0 ppb					0.77
:Acceptable Limit $\pm 5\%$					



MULTI-POINT GAS TEST REPORT

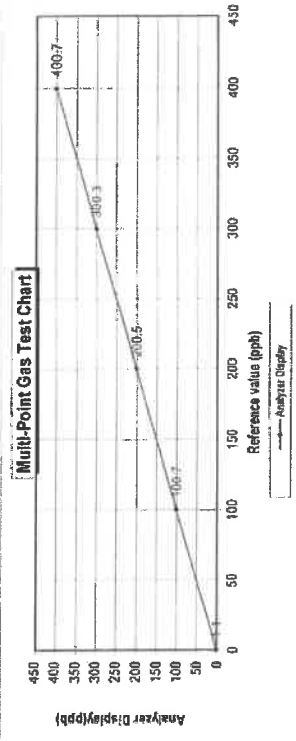
Test Date : Dec 8, 2021

Equipment : Gas Analyzer (NO<sub>2</sub>) Model : 421  
Manufacturer : Thermo Scientific Serial Number : 1201778109

Standard Gas Concentration  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM Thermo Scientific  
Nitric Oxide (NO) 45.35 PPM 1461  
Methane (CH<sub>4</sub>) - PPM 1180540071  
Carbon Monoxide (CO) 1007  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	% Error
Level 1	Zero	0.0	1.1	1.10	1.10
Level 2	20.00%	100.7	0.70	0.70	0.70
Level 3	40.00%	200.5	0.50	0.25	0.25
Level 4	60.00%	300.3	0.30	0.10	0.10
Level 5	80.00%	400.7	0.70	0.17	0.17
Remark : Measuring Range 500.0 ppb					0.46
:Acceptable Limit $\pm 5\%$					





MULTI-POINT GAS TEST REPORT

Test Date : Nov 17, 2021

Equipment : Gas Analyzer (NO<sub>2</sub>)  
Manufacturer : Thermo Scientific  
Model : 42i  
Serial Number : 1201778105

Standard Gas Concentration  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM  
Nitric Oxide (NO) 45.35 PPM  
Methane (CH<sub>4</sub>) 1007 PPM  
Carbon Monoxide (CO) 1007 PPM  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

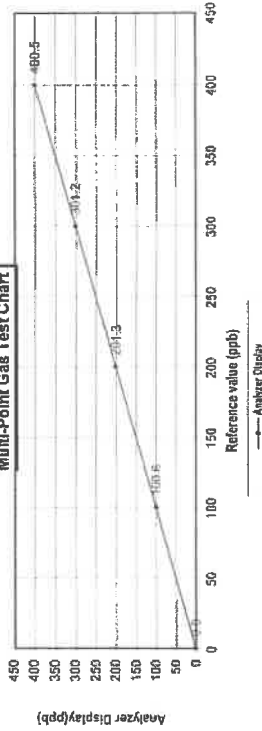
Dilutor Detail  
Manufacturer : Thermo Scientific  
Model : 146i  
Serial Number : 1180540071

Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.90	0.90	0.90
Level 2	20.00%	100.0	0.60	0.60	0.60
Level 3	40.00%	201.3	1.30	0.65	0.65
Level 4	60.00%	301.2	1.20	0.40	0.40
Level 5	80.00%	400.5	0.50	0.12	0.12
Measuring Range			Average Difference (%)		
500.0 ppb			0.53		

Remark : Measuring Range : Acceptable Unit  $\pm$  5%

Multi-Point Gas Test Chart



CERTIFICATE OF ANALYSIS  
Grade of Product: EPA Protocol

Part Number: E04N199E15A01QC  
Cylinder Number: CC159599  
Laboratory: 124 - Plumsteadville - PA  
PGVP Number: A12019  
Gas Code: CO, NO, NO<sub>2</sub>, SO<sub>2</sub>, BALN  
Reference Number: 160-401526192-1  
Cylinder Volume: 144.4 CF  
Cylinder Pressure: 2015 PSIG  
Valve Outlet: 660  
Certification Date: Jul 30, 2019  
Expiration Date: Jul 30, 2022

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2017)" document EPA 600/R-12/031, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 rel% (i.e. 0.7 mol% oxygen).

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NO <sub>x</sub>	45.00 PPM	44.78 PPM	G1	$\pm$ 0.8% NIST Traceable
NITRIC OXIDE	45.00 PPM	44.78 PPM	G1	$\pm$ 0.8% NIST Traceable
SULFUR DIOXIDE	45.00 PPM	45.35 PPM	G1	$\pm$ 1% NIST Traceable
CARBON MONOXIDE	1000 PPM	1007 PPM	G1	$\pm$ 0.4% NIST Traceable
NITROGEN				
Assay Dates				
				07/23/2019, 07/30/2019
				07/23/2019, 07/30/2019
				07/23/2019, 07/30/2019
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	18060121	KAL004215	249.3 PPM NITRIC OXIDE/NITROGEN	$\pm$ 0.4%
NTRM	052411	KAL004307	50.03 PPM NITRIC OXIDE/NITROGEN	$\pm$ 0.4%
NTRM	18060121	KAL004215	250.0 PPM NITRIC OXIDE/NITROGEN	$\pm$ 0.80%
NTRM	052411	KAL004307-NOX	50.03 PPM NOX/NITROGEN	$\pm$ 0.4%
NTRM	0141709	KAL003180	49.67 PPM SULFUR DIOXIDE/NITROGEN	$\pm$ 1.0%
NTRM	072508	KAL004570	970.0 PPM CARBON MONOXIDE/NITROGEN	$\pm$ 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Analytical Principle	Last Multipoint Calibration
CO MKS FTIR 000929062			FTIR	Jul 19, 2019
NO MKS FTIR 000929062			FTIR	Jul 22, 2019
NO MKS FTIR 000929062			FTIR	Jul 22, 2019
SO <sub>2</sub> MKS FTIR 000929062			FTIR	Jul 22, 2019

Triad Data Available Upon Request

NOTES: RAN# 51319-CM03  
PO# 5219002210  
GROSS WEIGHT: 28.6 KG  
NET WEIGHT: 4.1 KG



Signature on file

Approved for Release



United Analyst and Engineering Consultant Co., Ltd.  
3 Soi Udomsak 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260  
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com



United Analyst and Engineering Consultant Co., Ltd.  
3 Soi Udomsak 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260  
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

### MULTI-POINT GAS TEST REPORT

Test Date : Nov 30, 2021

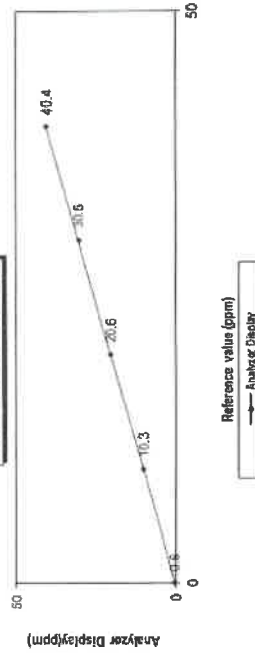
Equipment : Gas Analyzer (CO) Model : 481  
Manufacturer : Thermo Scientific Serial Number : 1201497730

**Standard Gas Concentration**  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM Thermo Scientific  
Nitric Oxide (NO) 45.35 PPM 1461  
Methane (CH<sub>4</sub>) - PPM 1180540071  
Carbon Monoxide (CO) 1007 PPM  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

#### Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero	0.0	0.6	0.6	0.6
Level 2 20.00%	10.3	0.3	2.9	2.9
Level 3 40.00%	20.6	0.6	2.9	2.9
Level 4 60.00%	30.5	0.5	1.6	1.6
Level 5 80.00%	40.4	0.4	1.0	1.0
Remark : Measuring Range		50.0 ppm		1.81
		Acceptable Limit $\pm 5\%$		

Multi-Point Gas Test Chart



เอกสารไม่ควบคุม

### MULTI-POINT GAS TEST REPORT

Test Date : Nov 30, 2021

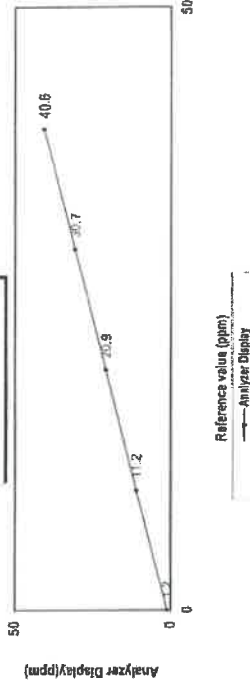
Equipment : Gas Analyzer (CO) Model : 481  
Manufacturer : Thermo Scientific Serial Number : 1201497732

**Standard Gas Concentration**  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM Thermo Scientific  
Nitric Oxide (NO) 45.35 PPM 1461  
Methane (CH<sub>4</sub>) - PPM 1180540071  
Carbon Monoxide (CO) 1007 PPM  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

#### Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero	0.0	1.2	1.2	1.2
Level 2 20.00%	10.0	11.2	10.7	10.7
Level 3 40.00%	20.0	20.9	4.3	4.3
Level 4 60.00%	30.0	30.7	2.3	2.3
Level 5 80.00%	40.0	40.6	1.5	1.5
Remark : Measuring Range		50.0 ppm		4.00
		Acceptable Limit $\pm 5\%$		

Multi-Point Gas Test Chart



เอกสารไม่ควบคุม

**MULTI-POINT GAS TEST REPORT**

Test Date : Nov 30, 2021

Equipment : Gas Analyzer (CO) Model : 481  
Manufacturer : Thermo Scientific Serial Number : 1201497733

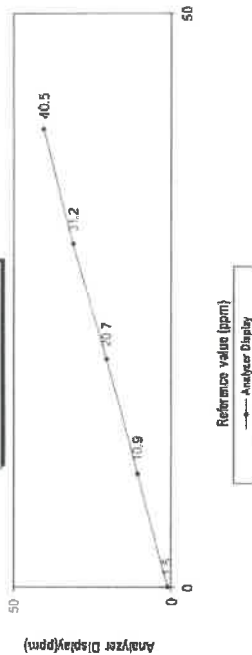
**Standard Gas Concentration**  
Sulphur Dioxide (SO<sub>2</sub>) 44.75 PPM Thermo Scientific  
Nitric Oxide (NO) 45.35 PPM 1461  
Methane (CH<sub>4</sub>) 31.2 PPM 1180540071  
Carbon Monoxide (CO) 100.7 PPM  
Cylinder No. : CC159599  
Expiration Date : Jul 30, 2022

**Multi-point gas test data**

Level	Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	1.5	1.5	1.5
Level 2	20.00%	10.0	10.9	8.3	8.3
Level 3	40.00%	20.0	20.7	3.4	3.4
Level 4	60.00%	30.0	31.2	3.8	3.8
Level 5	80.00%	40.0	40.5	1.2	1.2

Remark : Measuring Range 50.0 ppm  
Acceptable Limit  $\pm 5\%$

**Multi-Point Gas Test Chart**



**CERTIFICATE OF ANALYSIS**  
**Grade of Product: EPA Protocol**

Part Number: E04NI99E15A010C Reference Number: 150-401526192-1  
Cylinder Number: GC159599 Cylinder Volume: 144.4 CF  
Laboratory: 124 - Plumsleadville - PA Cylinder Pressure: 2015 PSIG  
PGVP Number: A12019 Valve Outlet: 650  
Gas Code: CO,NO,NOX,SO<sub>2</sub>,BALN Certification Date: Jul 30, 2019  
Expiration Date: Jul 30, 2022

Certification performed in accordance with EPA Traceability Protocol for Analytical Certification of Gaseous Calibration Standards (May 2017) document EPA-821-R-17-001. This document describes the procedures for the certification of gaseous calibration standards. The cylinder has a valid analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration standard. All concentrations are on a volume/volume basis unless otherwise noted.  
Do Not Use This Cylinder below 100 psig or 17 inHg.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	45.00 PPM	44.76 PPM	G1	+/- 0.8% NIST Traceable
NITRIC OXIDE	45.00 PPM	44.70 PPM	G1	+/- 0.8% NIST Traceable
SULFUR DIOXIDE	45.00 PPM	45.35 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	100.00 PPM	100.7 PPM	G1	+/- 0.4% NIST Traceable
NITROGEN				
Balance				
ANALYTICAL RESULTS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	18060121	KAL004215	249.9 PPM NITRIC OXIDE/NITROGEN	+/- 0.4%
NTRM	052411	KAL004307	50.03 PPM NITRIC OXIDE/NITROGEN	+/- 0.80%
NTRM	18060121	KAL004215	250.0 PPM NOX/NITROGEN	+/- 0.4%
NTRM	052411	KAL004307-NOX	50.03 PPM NOX/NITROGEN	+/- 0.80%
NTRM	0141709	KAL003190	40.67 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%
NTRM	072508	KAL004570	970.0 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Analytical Principle	Last Multipoint Calibration
CO MKS FTIR 00828002			FTIR	Jul 16, 2019
NO MKS FTIR 00828002			FTIR	Jul 22, 2019
NO MKS FTIR 00828002			FTIR	Jul 22, 2019
SO <sub>2</sub> MKS FTIR 00828002			FTIR	Jul 22, 2019

Third Data Available Upon Request

NOTES: RAN# 51319-CM03

PQ# 5219002210

GROSS WEIGHT: 28.6 KG

NET WEIGHT: 4.1 KG



Signature on file

Approved for Release

# THAI METEOROLOGICAL DEPARTMENT

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

## Calibration Certificate



Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue 16 August, 2021

Certification No. 38521

Page : 1 of 7

Object เครื่องมือวัดทางอุตุนิยมวิทยา

Manufacturer LSI

Type : Data Logger E-LOG 305 wind speed and wind direction DNA 827  
Thermogrometers DMA875 Barometer DCA 801  
Mfg Code : Data Logger 19040308 wind speed and wind direction 19020211  
Thermogrometers 19010187 Barometer 19040219  
Customer : United Analyst and Engineering Consultant Co., Ltd.

81 Soi Udomsuk 41, Sukhumvit Road,

Bangchak, Prakanong, Bangkok 10260.

Calibration Condition : Temperature 25.1 ° C Barometric Pressure 1011.2 hPa

NATIONAL STANDARD WIND TUNNEL Thermal Anemometer 642 SIN 91563

HOOK GAGE NO 1425 : Wind Aloft Plotting Board

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

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

Serial Number 110730029 (sensor 121629586)

JAPAN QUALITY ASSURANCE ORGANIZATION

STANDARD THERMOMETER

: Theodor Friedrich , Dry No.8390/94 Wet No. 8389/94



# THAI METEOROLOGICAL DEPARTMENT

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

## The Result of Calibration

Wind Speed And Wind Direction

Certification No. 38521

16 August, 2021 Model DNAS21 SIN 19020211

Page : 2 of 7

Standard Ultrasonic Anemometer m/sec	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure inches	Vacuum inches	Pressure hPa	Velocity m/sec	Correction m/sec
1.00	-	-	-	1.0	0.10
3.02	-	-	-	2.7	0.32
5.00	-	-	-	5.0	0.00
7.04	-	-	-	6.7	0.34
9.02	-	-	-	9.0	0.02
11.02	-	-	-	10.7	0.32
13.01	-	-	-	13.0	0.01
15.03	-	-	-	14.7	0.31
17.02	-	-	-	17.0	0.02
20.02	-	-	-	19.7	0.32

Wind Aloft Plotting Board.

U.S.DEPARTMENT OF COMMERCE WEATHER BUREAU

WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90



## Certificate of Calibration

**Customer**  
 Name : UNITED ANALYSIS AND ENGINEERING CONSULTING CO., LTD.  
 Address : 81 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Prakanong, Bangkok 10260

Certificate No : 21-ACCT-327  
 Request No : Req-2021-0995

### Unit Under Calibration Details

Measurement item : Acoustic Calibrator  
 Manufacturer : LARSON DAVIS  
 Model : CAL150  
 Serial Number : 6171  
 ID : UAE EFM.1732562

Class : 2  
 Range : 94 - 114 dB / 1000 Hz  
 Instrument Status : Used

### Calibration Environment and Details

Temperature : { 23 ± 2 °C }  
 Humidity : { 50 ± 20 %RH }  
 Barometric Pressure : { 1013 ± 10.0 hPa }  
 Received Date : 22 July 2021  
 Calibration Date : 24 August 2021  
 Location of Calibration : LAB 1 Acoustic  
 Calibration Procedure : In-house method CIP-ACCT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEL	14 May 2022
THD Multimeter	2015	1047765	NIMT	21 January 2022

**Traceability** : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

**Calibrated By :** Mr. Noppadon Lumgurt  
 Service Calibration Engineer  
**Approved By :** Mr. Paeil Mathayom  
 Calibration Engineer Supervisor  
**Issue Date :** 24 August 2021



**Certificate No** 21-ACCT-327  
**Request No** Req-2021-0995  
**Calibration Results : Without Adjustment**

### Sound pressure level

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 2 (± dB)
	Measured	Error	Measured	Error		
94 dB / 1000 Hz	94.10	0.10	-	-	0.12	0.40
114 dB / 1000 Hz	114.12	0.12	-	-	0.11	0.40

### Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 2 (± %)
	Measured (Hz)	Error (%)	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	1000.00	0.00	-	-	0.10	1.7
114 dB / 1000 Hz	1000.00	0.00	-	-	0.10	1.7

### Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 2 (± %)
	Measured (%)	Error (%)	Measured (%)	Error (%)		
94 dB / 1000 Hz	0.04	-	-	-	0.40	3.0
114 dB / 1000 Hz	0.21	-	-	-	0.40	3.0

### Note :

- Acceptance limit was IEC 60942:2017 Class 1
- The calibration results exclude the calibrator pressure correction
- The calibration results exclude the atmospheric pressure correction

### End of Calibration



# SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirthorn Rd, Bangbunru, Bangkok Bangkok 10700 THAILAND.  
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:center@sithiporn.com http://www.sithiporn.com



ISO/IEC 17025  
CALIBRATION 0394

Cert. No. : ACL22081  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** LARSON DAVIS  
**Model :** LxT2i Microphone 375B02 / Preamplifier PRML x 72B  
**Serial No.:** 0005286 / 011748 / 056087  
**ID No.:**

**Condition As Found :** GOOD

**Customer :** UNITED ANALYST AND ENGINEERING CONSULTANT (UAE)  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK SUB-DISTRICT,  
PHRAKHONG DISTRICT, BANGKOK 10260  
THAILAND.

**Location :**  
**Ambient Temperature :** ( 23.0 ± 3 ) °C  
**Pressure :** ( 101.3 ± 3 ) kPa  
**Relative Humidity :** ( 50.0 ± 20 ) %

**Received Date :** 18 JANUARY 2022  
**Calibration Date :** 26 JANUARY 2022  
**Date of Issue :** 28 JANUARY 2022

**Calibrated by :**

**Approved by :**

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

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

# SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 2 of 8

## Continuation of Calibration Certificate

**Calibration Procedure :** CP-AC-02

### Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with A-weighting and Reference Standard Instruments.  
For test results of each items were made by observation of each instruments display and also with SLM's display.

### Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY53202742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP_05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP_03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	I-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.  
3. This certificate is traceable to the international system of unit maintained at :

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

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

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Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 3 of 8

Summary of Measurement Result :

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

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.96)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value ( dB )
31.0

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

Frequency Weighting	Measured value ( dB )
A - weight	30.8
C - weight	30.6
Flat	36.8

3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
125	-0.1	0.1	0.0
1000	-0.2	-0.2	-0.2
8000	3.1	3.2	3.2
			Acceptance Limits
			± 1.5
			± 1.0
			±5.0

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
63	0.0	0.0	0.0
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.1	0.0
4000	0.0	0.0	0.0
8000	0.0	0.0	0.0
16000	-0.1	0.0	0.1
			±5.0(-∞)

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.1	0.1	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.1	0.1	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.1	0.1	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.1	0.1	± 1.1
44.0	44.2	0.2	± 1.1
39.0	39.6	0.6	± 1.1

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
140	94.0	94.0	0.0	±0.5

9. Tone burst response

Time Weighing	Tone burst duration, T <sub>b</sub> (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.8	-0.2	1.5 ; -5.0
	2	8	117.0	116.7	-0.3	1.0 ; -2.5
Slow	200	800	134.0	133.9	-0.1	±1.0
	2	8	108.0	107.8	-0.2	1.5 ; -5.0
SEL	200	800	127.6	127.5	-0.1	±1.0
	0.25	1	N/A	N/A	N/A	1.5 ; -5.0
	2	8	N/A	N/A	N/A	1.0 ; -2.5
	200	800	N/A	N/A	N/A	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L <sub>epk</sub> (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.7	-0.7	±3.0

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

เอกสารไม่ควบคุม  
Y. Retha-

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	0.2	±1.5
89.2	89.4		

12. High level stability

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

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

End of Calibration Certificate

เอกสารไม่ควบคุม  
Y. Retha-



## Certificate of Calibration

## Customer

UNITED ANALYST AND ENGINEERING CONSULTANTS LTD

Certificate No: 27,487,444

Address: 81 Sp. (Dorogok) St., Sukhumvit Road, Kanchik, Prakanong, Bangkok  
 Received No.: K-11-1000-1100

$$\text{Revised } N_0 = N_0(1 - \alpha)^{N_{\text{obs}}/N_{\text{sim}}}$$

### Unit Under Calibration Details

Measurement item :  
Sound Level Meter

Members Class 5

**Manufacturer**  
**LARSON DAVIS**

Munich-based Model - 175 AU

157

Subject: Mathematics Date: 12/12/2023

Journal Number: 10/16/2014

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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**INDEX**

[illegible][illegible]

100

[illegible]

<sup>11</sup> Jean Martin Barre

11-11-1964

$$0.534 \pm 0.29, \quad \frac{1}{\alpha} = 1.6 \pm 1.79.$$

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Figure 1. The effect of the concentration of the  $\text{Ca}^{2+}$  solution on the  $\text{Ca}^{2+}$  concentration in the  $\text{Ca}^{2+}$  solution.

$\vdash \text{true} \rightarrow \text{true}$

**Abstract**

Instrument	Brand	Model	S/N	Date calibration	Traceability
Standard Microphone	GRAS	40PA-N	132375	12 September 2022	GRAS
Multi-frequency Calibrator	Quest	Quest-cal	EFA000234	14 June 2022	TSI
Audio Generator	Swank	Swan40H	133	18 October 2022	WK Electric

**Note**

The reported uncertainty is based on standard uncertainties multiplied by the coverage factor  $k = 2$ , corresponding to a level of confidence of 95%.







## 12. Overload indication

UUC Setting	Measured UUC (dB)	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / T / J39			
STD Setting	141.7		
Positive one-half cycle			
Negative one-half cycle	141.8		
Recycled	-0.1	0.2	1.5

### 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance
PAST / A. 37-439	UUC		Limit
	(dB)	( $\pm$ dB)	( $\pm$ dB)
STD Setting	138.0		
Initial			
Final	138.0		
Revised	40.0	0.1	0.3

**End of Certificate**

The results related only to the mean calibrated. The certificate shall not be reproduced except in full, without written approval of the Bureau of Standards, Ltd.

### 3. Level linearity including the level range control

ULC Setting	Measured		UNCERTAINTY	Acceptance Limit
	STB REF (dB)	4TUC ERR (dB)		
FAST A	-42.8	-23.0	0.2	1.1
ULC Range	-42.8	-23.0	0.2	1.1
37-139	-42.8	-23.0	0.2	1.1

### 10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY	Acceptance
	Timecourse (ms)	Ref (dB)	UUC (dB)	ERR (dB)		Limit (± dB)
Fast	200	135.0	135.0	0.0		
	2	118.0	117.7	-0.3		-0.10, -2.5
	0.25	109.0	108.8	-0.2		+1.5, -5.0
Slow	200	128.6	128.5	-0.1	0.3	
	2	109.0	108.9	-0.1		-1.0, -5.0
	200	129.0	129.0	0.0		
SEL	2	109.0	109.3	+0.1		+1.0, -2.5
	0.25	100.0	100.0	0.0		+1.5, -5.0

### 11. Peak C Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST (1.1-95-142)					
STD Setting					
Complete cycle	137.4	136.8	-0.6dB	4.2	3.0
Positive half cycle	136.4	136.1	-0.30	4.2	2.0
Negative half cycle	136.4	136.2	-0.20	4.2	2.0

The results related only to the term calibrated. The accuracy shall not be reproduced except in full, without written approval of Fine Science & Technology Co., Ltd.  
เอกสารนี้มีความถูกต้องเฉพาะในกรณีที่มีการสอบเทียบเท่านั้น ไม่สามารถนำข้อมูลไปใช้ซ้ำโดยไม่ได้รับอนุญาตจาก บริษัท ไซน์ เทคโนโลยี จำกัด

# SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sithiporn Rd, Bangbunmu, Bangkok 10700 THAILAND.  
Tel: 0-2435-8800 Fax: 0-2433-1679 e-mail: center@sithiporn.com http://www.sithiporn.com



NSC-TS-17025  
CALIBRATION 0394

Cert. No. : ACL22081  
Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** LARSON DAVIS  
**Model :** LxT2 / Microphone 375B02 / Preampifier PRxML x T2B  
**Serial No.:** 0005286 / 011740 / 056087  
**ID No.:**

**Condition As Found :** GOOD

**Customer :** UNITED ANALYST AND ENGINEERING CONSULTANT (UAE)  
R1 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK SUB-DISTRICT,  
PHRAKHANONG DISTRICT, BANGKOK 10260  
THAILAND.

**Location :**  
**Ambient Temperature :** ( 23.0 ± 3 ) °C  
**Pressure :** ( 101.3 ± 3 ) kPa  
**Relative Humidity :** ( 50.0 ± 20 ) %

**Received Date :** 18 JANUARY 2022  
**Calibration Date :** 26 JANUARY 2022  
**Date of Issue :** 28 JANUARY 2022

**Calibrated by :** Nathakorn Pisupaisan

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

เอกสารไม่ควบคุม

QF-TS12-04-02(664)

# SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

## Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 2 of 8

**Calibration Procedure :** CP-AC-02

### Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.  
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP_05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP_03/0264	08-Feb-22
Digital Multimeter	34461A	MY60034273	1-15180725251-1	15-Sep-22
Programmable Attenuator	MA11-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

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

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

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

เอกสารไม่ควบคุม

QF-TS12-04-04(120664)

T. Phh.

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 3 of 8

Summary of Measurement Result :

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

เอกสารไม่ควบคุม  
Y. Reth...

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.96)	94.0	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value ( dB )
31.0

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

Frequency Weighting	Measured value ( dB )
A - weight	30.8
C - weight	30.6
Flat	36.8

3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight
125	-0.1	0.1	0.0
1000	-0.2	-0.2	-0.2
8000	3.1	3.2	3.2
Acceptance Limits			± 1.5
			± 1.0
			± 5.0

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Y. Reth...

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weight	A-weight Acceptance Limits
63	0.0	0.0	±2.0
125	0.0	0.0	±1.5
250	0.0	0.0	±1.5
500	0.0	0.0	±1.5
1000	0.0	0.0	±1.0
2000	0.0	0.1	±2.0
4000	0.0	0.0	±3.0
8000	0.0	0.0	±5.0
16000	-0.1	0.0	±5.0(+∞)

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long - term stability

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

เอกสารไม่ควบคุม

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.1	0.1	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.1	0.1	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.1	0.1	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.1	0.1	± 1.1
44.0	44.2	0.2	± 1.1
39.0	39.6	0.6	± 1.1

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QF-TS12-04-04-020664



Continuation of Calibration Certificate

Cert. No. : ACL22081  
 Job No. : VC65AC0044  
 Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB )	Measured Value (dB )	Deviated Value (dB )	Acceptance Limits (dB )
140	94.0	94.0	0.0	±0.5

9. Tone burst response

Time Weighting	Tone burst duration, Th (ms )	Cycle	Anticipated Value (dB )	Measured Value (dB )	Deviated Value (dB )	Acceptance Limits (dB )
Fast	0.25	1	108.0	107.8	-0.2	1.5 ; -5.0
	2	8	117.0	116.7	-0.3	1.0 ; -2.5
	200	800	134.0	133.9	-0.1	±1.0
Slow	2	8	108.0	107.8	-0.2	1.5 ; -5.0
	200	800	127.6	127.5	-0.1	±1.0
SEL	0.25	1	N/A	N/A	N/A	1.5 ; -5.0
	2	8	N/A	N/A	N/A	1.0 ; -2.5
	200	800	N/A	N/A	N/A	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB )	Measured Value, L <sub>ep</sub> peak (dB )	Deviated Value (dB )	Acceptance Limits (dB )
Continuous	133.0	133.0	0.0	-
One	136.4	135.7	-0.7	±3.0

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

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QF-TS/12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL22081  
 Job No. : VC65AC0044  
 Pages : 8 of 8

11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle	0.2	±1.5
89.2	89.4		

12. High level stability

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

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

End of Calibration Certificate

เอกสารไม่ควบคุม

QF-TS/12-04-04-020664

Certificate of Calibration

Customer

Name : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Address : 81 Soi Udomsak 41, Sukhumvit Road, Bangkok, Prakanong, Bangkok 10260

Certificate No : 22-ACT-104  
Request No : Req-2022-0232

Microphone Class : 2  
Microphone Model : 375A04  
Microphone S/N : 329353  
Preamplifier Model : PRMLxT2C  
Preamplifier S/N : 071534  
Instrument Status : Used

Unit Under Calibration Details

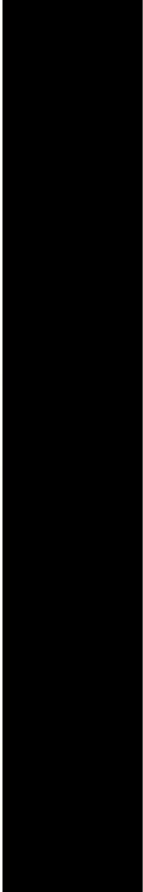
Measurement Item : Sound Level Meter  
Manufacturer : LARSON DAVIS  
Model : LxT2  
Serial Number : 4006614  
ID : UAEFFM045-2564  
Resolution : 0.1 dB

Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 MPa ± 10 hPa  
Received Date : 31 January 2022  
Calibrated Date : 11 February 2022  
Calibration Procedure : In-house method (P-SLM-01) based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periode tests  
Location of Calibration : Lab Acoustic

Reference Standard				
Instrument	Brand	Model	SN	Due calibration
Standard Microphone	GRAS	40AN	188273	15 September 2022
Midfrequency Calibrator	Quest	Questcal	EFA000234	14 June 2022
Audio Generator	Stank	Swa401	131	18 October 2022

Note  
The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.



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Certificate No : 22-ACT-104  
Request No : Req-2022-0232

1. Indication at the calibration check frequency

UUC Setting	Nominal		Before Adjust		Adjust		Acceptance Limit (± dB)
	Level (dB)		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)	
FAST / A / 37-139							
Calibrator Setting							
1000 Hz 114.00 dB	113.85		114.0	+0.15	113.9	0.05	0.20
							0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SYANTEK, Model SY 35A, SN:58079

2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST / 37-139		
UUC Weighting	(dB)	(± dB)
A	28.7	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY
FAST / 37-139		
UUC Weighting	(dB)	(± dB)
A	25.6	0.10
C	26.8	0.10
Z	34.7	0.10

4. Acoustic signal test of frequency, weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency			Acceptance Limit (± dB)
	Weighting Response curve			
FAST / 37-139	A	C	Z	UNCERTAINTY (± dB)
STD Setting	(dB)	(dB)	(dB)	
125 Hz	0.0	0.1	0.1	0.50
1000 Hz	0.0	0.0	0.0	0.60
4000 Hz	0.7	0.7	0.7	0.60
8000 Hz	1.0	0.9	0.8	0.70
				5.0

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where authorized Surrogate 4/16

AC 2025-0332

Page: 3/6

Certificate No 22-AC11-104  
Request No Req-2022-0332

#### 5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting FAST / 37-139	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance limit (± dB)
	A (dB)	C (dB)	Z (dB)		
STD Setting					
63 Hz	-0.2	0.0	0.0	0.2	2.0
125 Hz	-0.1	0.0	0.0		1.5
250 Hz	-0.1	0.0	0.0		1.5
500 Hz	-0.1	0.0	0.0		1.5
1000 Hz	0.0	0.0	0.0		1.0
2000 Hz	0.0	0.1	0.0		2.0
4000 Hz	0.0	0.0	0.0		3.0
8000 Hz	0.0	0.0	0.0		5.0
16000 Hz	-0.1	-0.1	-0.1		<-5 <sub>f</sub> -INF.

#### 6. Frequency and time weightings at 1 kHz

	UUC Setting		STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST : 37-139	UUC Weighting		UUC (dB)	ERR (dB)		
	A		114.00	114.0	0.0	0.2	
	C		114.00	114.0	0.0	0.2	0.2
	Z		114.00	114.0	0.0	0.2	0.2

	UUC Setting		STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	37-139 · A	UUC Time Response		UUC (dB)	ERR (dB)		
	Fast		114.00	114.0	0.0	0.1	0.1
	Slow		114.00	114.0	0.0	0.2	0.1
	Leq		114.00	114.0	0.0	0.1	0.1

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
FM-708-SUM-10 Rev 0 Issue date 01/37/11

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where authorized Surrogate 4/16

AC 2025

Page: 4/6

Certificate No 22-AC11-104  
Request No Req-2022-0332

#### 7. Long Term Stability

UUC Setting	Measured		UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
	UUC (dB)			
FAST / A : 37-139				
STD Setting				
Initial	114.0			
Final	114.0			
Deviated	0.0		0.1	0.3

#### 8. Level linearity on the reference level range

UUC Setting	Anticipated		Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	REF (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
FAST / A : 37-139						
STD dB						
140.00	140	0.0	140.0	0.0		1.1
139.00	139	0.0	139.0	0.0		1.1
134.00	134	0.0	134.0	0.0		1.1
129.00	129	0.0	129.0	0.0		1.1
124.00	124	0.0	124.0	0.0		1.1
119.00	119	0.0	119.0	0.0		1.1
114.00	114	0.0	114.0	0.0		1.1
109.00	109	0.0	109.0	0.0		1.1
104.00	104	0.0	104.0	0.0		1.1
99.00	99	0.0	99.0	0.0	0.3	1.1
94.00	94	0.0	94.0	0.0		1.1
89.00	89	0.0	89.0	0.0		1.1
84.00	84	0.0	84.0	0.0		1.1
79.00	79	0.0	79.0	0.0		1.1
74.00	74	0.0	74.0	0.0		1.1
69.00	69	0.0	69.0	0.0		1.1
64.00	64	0.0	64.0	0.0		1.1
59.00	59	0.0	59.0	0.0		1.1
54.00	54	0.0	54.0	0.0		1.1
49.00	49	0.0	49.0	0.0	1.1	
44.00	44	0.1	44.1	0.1	1.1	
39.00	39	0.3	39.3	0.3	1.1	

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
FM-708-SUM-10 Rev 0 Issue date 01/37/11

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Certificate No : 22-ACT-104  
Request No : Req-2022-0232

#### 9. Level linearity including the level range control

UUC Setting	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST: A					
UUC Range					
37-139	+1.1	-0.7	-0.4	0.3	1.1
	11.4	114.0	0.0		1.1

#### 10. Tone burst response

UUC Setting	STD Toneburst (ms)	Anticipated REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
			UUC (dB)	ERR (dB)		
FAST	200	135.0	135.0	0.0		1.0
	2	118.0	117.9	-0.1		+1.0, -2.5
	0.25	109.0	108.7	-0.3		+1.5, -5.0
SLOW	200	128.6	128.5	-0.1	0.3	1.0
	2	109.0	108.8	-0.2		+1.0, -5.0
	200	129.0	129.0	0.0		1.0
SEL	2	100.0	109.1	+0.1		+1.0, -2.5
	0.25	100.0	99.7	-0.3		+1.5, -5.0

#### 11. Peak C Sound level

UUC Setting	FAST: C / 95-142	STD Setting	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
			UUC (dB)	ERR (dB)		
Complete cycle						
Positive half cycle						
Negative half cycle						

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PK-708-SLA-99 Rev.0 Issue date: 01.07.17

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Certificate No : 22-ACT-104  
Request No : Req-2022-0232

#### 12. Overload indication

UUC Setting	FAST: A / 37-139	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
Positive one-half cycle				
Negative one-half cycle				
Deviated		0.1	0.2	1.5

#### 13. High Level Stability

UUC Setting	FAST: A / 37-139	Measured UUC (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
Initial				
Final				
Deviated		0.0	0.1	0.3

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PK-708-SLA-99 Rev.0 Issue date: 01.07.17

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Certificate of Calibration

**Customer**  
**Name** : UNITED ANALYST AND ENGINEERING CONSULTANT (U) LTD.  
**Address** : 81 Soi Udomsak 41, Sukhumvit Road, Bangkok, Prakanong, Bangkok 10260  
**Certificate No** : 22-ACT-105  
**Request No** : Req-2022-0229

**Unit Under Calibration Details**  
**Measurement Item** : Sound Level Meter  
**Manufacturer** : LARSON DAVIS  
**Model** : Lx72  
**Serial Number** : 0605396  
**ID** : UAE EFM.033-2564  
**Resolution** : 0.1 dB  
**Calibration Environment and Details**  
**Temperature** : 23 °C ± 2 °C  
**Humidity** : 50 %RH ± 20 %RH  
**Barometric Pressure** : 1013 hPa ± 10 hPa  
**Received Date** : 31 January 2022  
**Calibrated Date** : 11 February 2022  
**Calibration Procedure** : In-house method (P-SI-M-01) based on IEC 61672-3 ; 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
**Location of Calibration** : Lab Acoustic

Reference Standard

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	GRAS	40AN	188273	13 September 2022	GRAS
Multi-frequency Calibrator	Quest	Quest-cal	EFA000234	14 June 2022	YSI
Audio Vibration	Sontek	Sonotek	131	18 October 2022	WK Electric

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

**Certificate No** : 22-ACT-105  
**Request No** : Req-2022-0229

1. Indication at the calibration check frequency

UUC Setting	Nominal Level (dB)	Before Adjust UUC (dB)	ERR (dB)	Adjust UUC (dB)	ERR (dB)	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A / 37-139							
1000 Hz 114.00 dB	113.85	113.9	40.05	113.9	0.05	0.20	0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Pream SVANTEK, Model SV 35A, SN.38079

2. Self-generated noise, Microphone installed

UUC Setting	Measured UNCERTAINTY (dB)
FAST / 37-139	
UUC Weighting A	27.8
	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured UNCERTAINTY (dB)
FAST / 37-139	
UUC Weighting A	27.8
	0.10
C	27.3
	0.10
Z	33.1
	0.10

A. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / 37-139	A C Z		
STD Setting	(dB)	(dB)	(dB)
125 Hz	0.1	0.1	0.2
1000 Hz	0.0	0.0	0.0
4000 Hz	0.6	0.5	0.6
8000 Hz	0.1	0.0	0.2



Certificate No : 22-ACT-105  
Request No : Req-2022-0229

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting		Deviation from various Frequency Weighting Response curve				UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
FAST / 37-139	STD Setting	A (dB)	C (dB)	Z (dB)			
	63 Hz	-0.2	0.0	0.0	0.2	2.0	
	125 Hz	-0.1	0.0	0.0		1.5	
	250 Hz	-0.1	0.0	0.0		1.5	
	500 Hz	-0.1	0.0	0.0		1.5	
	1000 Hz	0.0	0.0	0.0		1.0	
	2000 Hz	0.0	0.1	0.0		2.0	
	4000 Hz	0.0	0.0	0.0		3.0	
	8000 Hz	0.0	0.0	0.0		5.0	
	16000 Hz	-0.1	-0.1	-0.1		>5, -INF.	

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		REF	ERR		
		(dB)	(dB)		
FAST / 37-139				0.2	0.2
UUC Weighting					
A	114.00	114.0	0.0		
C	114.00	114.0	0.0		
Z	114.00	114.0	0.0	0.2	0.2
UUC Setting					
37-139 / A					
UUC Time Response					
Fast	114.00	114.0	0.0	0.2	0.1
Slow	114.00	114.0	0.0		
Log	114.00	114.0	0.0		

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PM-708-SLM-01 Rev-0 Issue date 01/07/19

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Certificate No : 22-ACT-105  
Request No : Req-2022-0229

7. Long Term Stability

UUC Setting	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	FAST / A / 37-139	UUC (dB)		
STD Setting				
Initial		114.0		
Final		114.0		
Deviated		0.0		

8. Level linearity on the reference level range

UUC Setting	Anticipated REF (dB)	Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST / A / 37-139				0.3	
STD dB					
139.00	139	139.0	0.0		
134.00	134	134.0	0.0		
129.00	129	129.0	0.0		
124.00	124	124.0	0.0		
119.00	119	119.0	0.0		
114.00	114	114.0	0.0		
109.00	109	109.0	0.0		
104.00	104	104.0	0.0		
99.00	99	99.0	0.0		
94.00	94	93.9	-0.1		
89.00	89	88.9	-0.1		
84.00	84	83.9	-0.1		
79.00	79	78.9	-0.1		
74.00	74	73.9	-0.1		
69.00	69	68.9	-0.1		
64.00	64	63.9	-0.1		
59.00	59	58.9	-0.1		
54.00	54	53.9	-0.1		
49.00	49	48.9	-0.1		
44.00	44	44.0	0.0		
39.00	39	39.2	0.2		
38.00	38	38.3	0.3		

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
PM-708-SLM-01 Rev-0 Issue date 01/07/19

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Certificate No : 22-ACF-105  
Request No : Req-2022-0229

9. Level linearity including the level range control

UUC Setting	STD REF	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST: A					
UUC Range					
37-139		42.8	-0.4	0.3	1.1
		134.0	0.0		1.1

10. Tone burst response

UUC Setting	STD Tonsburst	Anticipated Ref (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
			UUC (dB)	ERR (dB)		
A / 37-139						
UUC Time Response						
	Fast					
	Slow					
SPL						

11. Peak C Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST: C / 95-142					
STD Setting					
Complete cycle	137.4	136.7	-0.70		3.0
Positive half cycle	136.4	136.2	-0.20	0.2	2.0
Negative half cycle	136.4	136.2	-0.20		2.0

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FM-208-SL-M-01 Rev. 0 Issue date 01/07/19

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Certificate No : 22-ACF-105  
Request No : Req-2022-0229

12. Overload indication

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST: A / 37-139	UUC (dB)		
STD Setting			
Positive one-half cycle	141.7		
Negative one-half cycle	141.8		
Deviated	-0.1	0.2	1.5

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST: A / 37-139	UUC (dB)		
STD Setting			
Initial	138.0		
Final	138.0		
Deviated	0.0	0.1	0.3

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument (S) Ltd.  
FM-208-SL-M-01 Rev.0 Issue date 01/07/19

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SIAMLIANG, SIAMLIANG BANGKOK 10250  
TEL. 0-2717-3000-27 FAX. 0-2719-9484



Cert.No.: 21CH1607  
Page.: 1 of 3

## Certificate of Calibration

Equipment : pH Meter  
Manufacturer : Horiba  
Model : LAQUA-PH210  
Serial No. : HA1F0002  
ID No. : UAF FFM 2002/564 (E-HM pH 00004)  
Condition As-Received:  
Received Date : 18 November 2021  
Calibration Date : 19 November 2021  
Reference : 2111 (E-HM) pH  
Submitted by : United Analytical and Engineering Consultant (UAE)  
333 Mittraphong 41, Sukhumvit Road,  
Bangkok, Thailand, Bangkok 10110  
(E-HM) pH  
In-house method  
Calibration Procedure :  
1. (E-HM) pH direct measurement with standard  
2. (E-HM) pH direct measurement with standard  
3. (E-HM) pH direct measurement with standard  
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98. (E-HM) pH direct measurement with standard  
99. (E-HM) pH direct measurement with standard  
100. (E-HM) pH direct measurement with standard

Calibrated by : Warakorn Larnagatrakul

Approved by :  
Signature

( ) Malee Bulkuea  
( ) Sathip Meangmai  
( ) Warakorn Larnagatrakul

Issue Date : 20 November 2021

This Certificate is for a confidence probability of approximately 95 %

This certificate may not be reproduced other than in full except with the prior written  
approval of the head of Corporate Services, Technology Calibration and Testing Division

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Cert.No.: 21CH1607  
Page.: 2 of 3

## Condition of this calibration result

1. Reference Standard Instrument  
Instrument : pH Meter  
Serial No. : 54030049  
ID No. : 110RC116  
Cert. No. : 2112682  
Due Date : 25 Aug 2022  
2) Ref. Standard Thermometer  
Serial No. : 4982054  
ID No. : 110RC044  
Cert. No. : 2111201  
Due Date : 26 Oct 2022  
This certification is traceable to the International System of Unit maintained at:-  
- Traceable to National Institute of Metrology (Thailand), NIMT  
2. Certified Reference Materials : The measurement results are traceable to SI through CPA Chem Ltd.,  
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution : pH 4.005  
Manufacturer : CPA Chem  
Lot No. : 761016  
Exp. date : 02 Aug 2022  
pH 7.005  
Manufacturer : CPA Chem  
Lot No. : 761017  
Exp. date : 02 Aug 2022  
pH 10.015  
Manufacturer : CPA Chem  
Lot No. : 761018  
Exp. date : 02 Aug 2022  
This certificate is valid only to the item calibrated on date and place of calibration

## Calibration Results

Function : mV Measurement

Performing standard curve by Fit (4, 1/N, 10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (mV)	Coverage factor
			mV	pH		
pH Meter S/N: HA1F0002	4.00	1.1746	1.174	4.01	0.058	2.00
	7.00	0.00	-0.2	7.02	0.058	2.00
	10.00	-177.48	-177.6	10.01	0.058	2.00

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Cert.No.: 21CH1507  
Page.: 3 of 3

#### Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH measurement (±)	Coverage factor h
pH Electrode S/N: 991ED471	4.008	4.01	172	0.0071	2.00
	6.982	6.98	-4	0.011	2.00
	6.982	6.98	-4	0.011	2.00
	7.0116	7.01	181	0.011	2.00

#### Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe.

Model : 9852

Serial No. 10110471

Dimension of probe;

- Length : 103 mm.

Diameter : 16 mm.

Immersion Depth : 90 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor A
25.0	25.002	25.0	-0.002	0.13	2.00
30.0	30.004	30.0	-0.004	0.13	2.00
35.0	35.003	35.0	-0.003	0.13	2.00

Remark : - UUC\* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 %.

Page 3

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INNOVATIVE INSTRUMENT CALIBRATION LAB

INNOVATIVE INSTRUMENT CO., LTD HEAD OFFICE

719/96013, SOUSINSAKORN 11 TAMBON BANG KADU,

AMPHUR BANG PHU INSAK 3 TROK AN PRANGUE 10440 HEAD AND

TEL : 0909211000 FAX : 0909211001



ANAB  
Association of National Accreditation Bodies  
ACCREDITED  
Calibration Laboratory

Page 1 of 2

#### Certificate of Calibration

Customer

Name : UNITED ANALYST AND ENGINEERING

Certificate No. 21-ACT-187

Address : CONSULTANT CO., LTD.

Request No. Req-2021-4523

Address : 81 Soi Udonlek 41, Sukhumvit Road, Bangchak, Prakanong Bangkok 10260

#### Unit Under Calibration Details

Measurement Item : Acoustic Calibrator

Manufacturer : SVANTEK

Model : SV 35A

Serial Number : 73249

ID : UAE.EFM.105/2561

Class : I

Range : 94, 114 dB (900 Hz)

Instrument Status : Used

#### Calibration Environment and Details

Temperature : (23 ± 2 °C)

Humidity : (50 ± 20 %RH)

Barometric Pressure : (1013 ± 10.6 hPa)

Received Date : 27 April 2021

Calibration Date : 28 May 2021

Location of Calibration : LAB 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

#### Reference Standard

Sound Calibrator

Model : SV 35A

Serial Number : 58079

Due Calibration : 14 May 2022

Traceable : NIMT

Serial Number : 1047765

Due Calibration : 23 January 2022

#### Traceability

: This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

#### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Calibrated By :

Mr. Noppadon Luangut

Service Calibration Engineer

Approved By :

Mr. Prit Mathavorn

Calibration Engineer Supervisor

Issue Date :

28 May 2021

The results explained only in the form released. The certificate shall not be reproduced except in full, without written approval of the issuing body.  
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ANAB ACCREDITED CALIBRATION LABORATORY 01070719

Certificate of Calibration

Customer

Name UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD  
Address 81 Sni Udomsak 41, Sukhumvit Road, Bangkok, Prakanung, Bangkok  
(10560)  
Certificate No : 22-ACT-165  
Request No : Req-2022-0023

Unit Under Calibration Details

Measurement Item Sound Level Meter  
Manufacturer K&N  
Model NI-42  
Serial Number 00499050  
1) UAE EFM.0122564  
Resolution 0.1 dB  
Calibration Environment and Details  
Temperature 23 °C ± 2 °C  
Humidity 50 %RH ± 20 %RH  
Barometric Pressure 1013 hPa ± 10 hPa  
Received Date 31 January 2022  
Calibrated Date 3 February 2022

Calibration Procedure

Location of Calibration In-house method CP-SLM-01 based on IEC 61672-1 : 2013 Electroacoustics - Sound level meters - Part 1: Periodic tests  
Reference Standard Lab Acoustic  
Instrument Brand Model SN, Traceability  
Standard Microphone GRAS 40AN 188771 15 September 2022 GRAS  
Multi frequency Calibrator Quest Quest-341 EFA091234 14 June 2022 TSI  
Audio Generator Svanick SvandH 131 18 October 2022 WTC Elective

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By :

Mr. Noppadol L.ungart  
Calibration Officer

Approved By :

Mr. Pasi Malaveen  
Calibration Engineer Supervisor  
3 February 2022

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovate Instrument Co., Ltd.

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Certificate No : 21-ACT-187

Request No : Req-2021-0523

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)
	Measured	Error		
94 dB / 1000 Hz	93.81	-0.19	0.11	0.25
114 dB / 1000 Hz	113.83	-0.17	0.11	0.25

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	999.97	0.003	0.02	0.70
114 dB / 1000 Hz	999.98	0.002	0.02	0.70

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (%)	Measured (%)		
94 dB / 1000 Hz	0.18	-	0.17	2.5
114 dB / 1000 Hz	0.04	-	0.17	2.5

Note :

- Acceptance limit was (IEC60942:2017 Class 1
- The calibration results exclude the calibration pressure correction
- The calibration results exclude the microphone volume correction

End of Calibration

The results related only to the items calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovate Instrument Co., Ltd.

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Certificate No : 22-ACT-063  
Request No : Req-2022-0223

1. Indication at the calibration check frequency

UUC Setting FAST / 25 - 138	Nominal		Before Adjust		Adjust		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	Level (dB)		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
Calibrator Setting 1000 Hz, 114.00 dB	93.95		93.9	-0.05	93.9	-0.05	0.20	0.3

Note: Absolute sensitivity was established by the use of Sound Calibrator Brand Sramak, Model SV 35A, SN 38879

2. Self-generated noise, Microphone installed

UUC Setting FAST / 25 - 138	Measured		UNCERTAINTY ( $\pm$ dB)
	Level (dB)		
UUC Weighting A	14.3		0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting FAST / 25 - 138	Measured		UNCERTAINTY ( $\pm$ dB)
	Level (dB)		
UUC Weighting A	11.3		0.10
C	16.7		0.10
Z	22.8		0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting FAST / 25 - 138	Deviation from various Frequency Weighting Response curve				Acceptance Limit ( $\pm$ dB)
	A	C	Z	UNCERTAINTY ( $\pm$ dB)	
STD Setting 125 Hz	0.2	0.4	0.3	0.50	1.5
1000 Hz	0.0	0.0	0.0	0.60	1.0
4000 Hz	-0.5	-0.5	-0.5	0.60	3.0
8000 Hz	-2.5	-2.4	-1.5	0.70	5.0

Certificate No : 22-ACT-067  
Request No : Req-2022-0223

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting FAST / 25 - 138	Deviation from various Frequency Weighting Response curve				UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	A (dB)	C (dB)	Z (dB)	ERR (dB)		
STD Setting 63 Hz	-0.2	-0.4	-0.1			2.0
125 Hz	-0.1	0.0	0.0			1.5
250 Hz	-0.1	0.0	0.0			1.5
500 Hz	0.0	0.1	0.0			1.5
1000 Hz	0.0	0.0	0.0		0.2	1.0
2000 Hz	0.0	0.1	0.0			2.0
4000 Hz	0.0	0.0	0.0			3.0
8000 Hz	0.1	0.1	0.0			5
16000 Hz	-1.3	-1.3				4.5 -181

6. Frequency and time weightings at 1kHz

UUC Setting FAST / 25 - 138	STD		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	REF (dB)		UUC (dB)	ERR (dB)		
UUC Weighting A	94.00		94.0	0.0		0.2
C	94.00		94.0	0.0	0.2	0.2
Z	94.00		94.0	0.0		0.2

UUC Setting 25 - 138 / A	STD		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	REF (dB)		UUC (dB)	ERR (dB)		
UUC Time Response Fast	94.00		94.0	0.0		0.1
Slow	94.00		94.0	0.0	0.2	0.1
Acq	94.00		94.0	0.0		0.1

Certificate No 22-ACT-007  
Request No Req-2022-0223

7. Long Term Stability

UUC Setting FAST / A / 25 - 138	Measured UUC (dB)	Acceptance	
		UNCERTAINTY (± dB)	Limit (± dB)
STD Setting	Initial	0.4	0.3
	Final		
Deviation	0.0	0.1	0.3

8. Level linearity on the reference level range

UUC Setting FAST / A / 25 - 138	STD dB	Anticipated REF (dB)	Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
			UUC (dB)	ERR (dB)		
137.00	137	137	137.0	0.0	0.3	0.8
136.00	136	136	136.0	0.0		0.8
135.00	135	135	135.0	0.0		1.1
134.00	134	134	134.0	0.0		1.1
129.00	129	129	129.0	0.0		1.1
124.00	124	124	124.0	0.0		1.1
119.00	119	119	119.0	0.0		1.1
114.00	114	114	114.0	0.0		1.1
109.00	109	109	109.0	0.0		1.1
104.00	104	104	104.0	0.0		1.1
99.00	99	99	99.0	0.0	0.3	1.1
94.00	94	94	94.0	0.0		1.1
89.00	89	89	89.0	0.0		1.1
84.00	84	84	84.0	0.0		1.1
79.00	79	79	79.0	0.0		1.1
74.00	74	74	74.0	0.0		1.1
69.00	69	69	69.0	0.0		1.1
64.00	64	64	64.0	0.0		1.1
59.00	59	59	59.0	0.0		1.1
54.00	54	54	54.0	0.0		1.1
49.00	49	49	49.0	0.0	0.3	1.1
44.00	44	44	44.0	0.0		1.1
39.00	39	39	39.0	0.0		1.1
34.00	34	34	34.0	0.0		1.1
29.00	29	29	29.0	0.0		1.1
24.00	24	24	24.0	0.0		1.1
21.00	21	21	21.0	0.0		1.1
26.00	26	26	26.0	0.0		1.1
25.00	25	25	25.0	-0.1		1.1

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IN-0085-LS-01 Rev.01 Issue date 01/07/21

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Certificate No 22-ACT-007  
Request No Req-2022-0223

9. Level linearity including the level range control

UUC Setting FAST / A	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
UUC Range	29.5	29.6	0.1	0.3	1.1
	94	94.0	0.0		1.1

10. Tone burst response

UUC Setting A / 25 - 138	STD Toneburst (ms)	Anticipated Ref (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
			UUC (dB)	ERR (dB)		
Fast	200	124.0	134.0	0.0	0.3	1.0
	2	117.0	117.0	0.0		+1.0, -2.5
	0.25	108.0	102.9	-0.1		+1.5, -5.0
Slow	200	123.6	127.6	0.0		1.0
	2	108.0	106.0	0.0		+1.0, -5.0
	200	128.0	128.0	0.0		1.0
Sil	2	108.0	108.0	0.0	0.3	+1.0, -2.5
	0.25	99.0	98.9	-0.1		+1.5, -5.0

11. Peak C Sound level

UUC Setting FAST / C / 25 - 138	Anticipated REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
STD Setting	133.4	132.9	-0.50	0.2	3.0
Complete cycle	133.4	132.2	-0.20		2.0
Positive half cycle	132.3	132.2	-0.20		2.0
Negative half cycle	132.4	132.2	-0.20	0.2	2.0
					2.0

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IN-0085-LS-01 Rev.01 Issue date 01/07/21

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## 12. Overload Indication

UCC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A, 25 - 138	UCC		
STD Setting	(dB)	( $\pm$ dB)	
Positive one-half cycle	139.4		
Negative one-half cycle	139.4		
Flattened	0.0	0.2	1.5

### 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY { ± dB}	Acceptance
FAST A / 25 - 135	UUC		
STD Setting	6dB		
Initial	137.0		
Final	137.0		
Revised	0.0	0.1	0.3

## End of Certificate

## เอกสารไม่ควบคุม

451-451/1 Srinthorn Rd., Bangbunru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiporn.com <http://www.sithiporn.com>

**Cert. No. : ACL22075**  
**Pages : 1 of 8**

# Calibration Certificate

<b>Equipment :</b>	SOUND LEVEL METER
<b>Manufacturer :</b>	RION
<b>Model :</b>	NL-42/ Microphone UC-52 / Preamplifier NH-24
<b>Serial No.:</b>	00709682 / 187256 / 01233
<b>ID No.:</b>	-

**Condition As Found :**

Correspondence :  
 UTHAI ANANT VET. AND LUNG INSTITUTE (UOL) (UAE)  
 81 SOUTH MOSEBY 41, SUBHOMVILLI ROAD,  
 BANGCHAK SUB-DISTRICT,  
 PHRAKHAMONG DISTRICT, BANGKOK 10260  
 THAILAND.

**J. Edgar Hoover**  
D-86

**Ambient Temperature:** ( 23.0 ± 3 ) °C

Pressure: (1013 ± 3) kPa

Relative Humidity : ( 70 ± 10 ) %

Received for publication, February 11, 1993; accepted, April 1, 1993.

**Publication Date:** 11/2/2011

# Debut Album

• 1944

## Tabellen Fußnoten

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard and the reproduced information is not subject to any further audit.

[illegible]

## เอกสารไม่ควบคุม

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC65AC0044  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with A-weighting chamber and Reference Standard Instruments.

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

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52102742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP_050264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP_030264	08-Feb-22
Digital Multimeter	34461A	MY52002423	115100177771	13-Sep-22
Programmable Attenuator	MA11010	62100114	1500177741	08-Mar-22
Condenser Microphone	4180	2971900	AA100R-21	05-Feb-22
Measuring Amplifier	115-41R-51	34500492	5.5.2002-21	16-Feb-22

4. This result of calibration was found accurate so observed places of calibration for this calibrated item only

5. This certificate is traceable to the International System of unit maintained at :

- 2.1 National Institute of Standards & Technology (NIST)
- 3. Thailand Institute of Scientific and Technological Research (TISTR)

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC65AC0044  
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.1	0.6
5000 Hz	✓	-	0.1	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For 4 kHz to 10 kHz	✓	-	0.1	0.7
For 10 kHz to 20 kHz	-	-	-	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.1	0.2
6. Long-term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.1	0.25
12. High level stability	✓	-	0.1	0.1

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC6SAC0044  
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
95.9 (95.96)	91.9	0.0	±0.1

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

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

Frequency Weighting	Measured value (dB)
A-weighting	10.6
C-weighting	10.7
Flat	11.5

3. Acoustical signal tests of frequency weightings

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

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)		
	Flat	A-weighting	Acceptance Limits
125	0.1	0.1	±1.5
500	-0.1	-0.1	±1.0
2000	0.3	0.0	±5.0

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VC6SAC0044 0000024

T. Petcha.

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC6SAC0044  
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)		
	Flat	C-weighting	A-weighting
63	-0.1	0.0	0.0
125	0.0	0.0	0.0
250	0.0	0.0	-0.1
500	0.0	0.0	-0.1
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Final remarks

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weighting	94.0	94.0	0.0	±0.2

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VC6SAC0044 0000024

T. Petcha.



Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC6SAC0044  
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	132.9	-0.1	±1.1
132.0	131.9	-0.1	±1.1
131.0	130.9	-0.1	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.1	0.1	±1.1
28.0	28.1	0.1	±1.1
27.0	27.1	0.1	±1.1
26.0	26.0	0.0	±1.1
25.0	25.1	0.1	±1.1

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T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC6SAC0044  
Pages : 7 of 8

8. Level linearity including the level range control

Page	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A <sub>100</sub>	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, T <sub>b</sub> (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.2	-0.2	±3.0

Number of cycles in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
Fast rise half cycle	132.4	132.1	-0.3	±3.0
Fast fall half cycle	132.4	132.1	-0.3	±3.0

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T. Petch.

Continuation of Calibration Certificate

Cert. No. : ACL22075  
Job No. : VC65AC0044  
Pages : 8 of 8

11. Overload Indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limit ( dB )
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

Frequency Weighting	SIM Display at initial ( dB )	SIM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limit ( dB )
A-weighting	137.0	137.0	0.0	±0.3

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

End of Calibration Certificate

Certificate of Calibration

Customer : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
Name : Certificate No : 25-AC1-006  
Address : 81 Soi Udonnuek 41, Sukhumvit Road, Bangchak, Prakanong, Bangkok.  
Request No : RCN-2022-0095  
10260

Unit Under Calibration Details

Measurement item : Sound Level Meter  
Manufacturer : LARSON DAVIS  
Model : LA72  
Serial Number : 0005496  
ID : LALFEM0372564  
Resolution : 0.1 dB  
Calibration Environment and Details : 23 °C ± 2 °C  
Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 14 January 2022  
Calibrated Date : 21 January 2022  
Calibration Procedure : In-house method (E-SLM-01) based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Portable tests  
Location of Calibration : Job 8008516

Instrument Status : Used

Reference Standard

Instrument	Brand	Model	S/N	Due calibration	Traceability
Standard Microphone	GRAS	40AN	168273	15 September 2022	GRAS
Mid-frequency Calibrator	Quest	Questcal	EF-A000234	14 June 2022	ISI
Audio Generator	Stanek	Scansoft	131	18 October 2022	WJ Electre

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage factor k = 2, providing a level of confidence approximately 95 %.

Certificate No: 22-ACT-036  
 Request No: Req-2022-0095

1. Indication at the calibration check frequency

UUC Setting	Nominal Level (dB)	Before Adjust		Adjust		Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)	
FAST: A 37-139	113.85	113.9	-0.05	113.9	0.05	( $\pm$ )

Note: Absolute sensitivity was established by the use of Sound Calibrator Brand SYNTREX, Model SN 35A, SN:58079

2. Self-generated noise, Microphone installed

UUC Setting	Measured (dB)	UNCERTAINTY ( $\pm$ dB)
FAST: 37-139	29.0	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured (dB)	UNCERTAINTY ( $\pm$ dB)
FAST: 37-139	28.8	0.10
A	28.2	0.10
C	32.9	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve				Acceptance Limit ( $\pm$ dB)
	A (dB)	C (dB)	Z (dB)	UUC ( $\pm$ dB)	
FAST: 37-139	-0.1	0.1	0.50	0.50	2.0
STD Setting 125 Hz	0.0	0.0	0.60	0.60	1.0
1000 Hz	0.4	0.5	0.6	0.60	3.0
8000 Hz	0.4	0.4	0.5	0.70	5.0

Certificate No: 22-ACT-036  
 Request No: Req-2022-0095

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Response curve				Acceptance Limit ( $\pm$ dB)
	A (dB)	C (dB)	Z (dB)	UUC ( $\pm$ dB)	
FAST: 37-139	-0.2	-0.1	0.0	0.0	2.0
STD Setting 63 Hz	-0.1	0.0	0.0	0.0	1.5
125 Hz	-0.1	0.0	0.0	0.0	1.5
250 Hz	-0.1	0.0	0.0	0.0	1.5
500 Hz	0.0	0.0	0.0	0.0	1.5
1000 Hz	0.0	0.0	0.0	0.0	1.0
2000 Hz	0.0	0.0	0.0	0.0	2.0
4000 Hz	0.0	0.0	0.0	0.0	3.0
8000 Hz	-0.1	0.0	0.0	0.0	5
16000 Hz	-0.1	-0.1	0.0	0.0	-5, -INF

6. Frequency and time weightings at 1kHz

UUC Setting	STD REF (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		UUC (dB)	ERR (dB)		
FAST: 37-139	114.00	114.0	0.0	0.2	0.2
UUC Weighting A	114.00	114.0	0.0	0.2	0.2
C	114.00	114.0	0.0	0.2	0.2
Z	114.00	114.0	0.0	0.2	0.2

Certificate No. 22-AC-0436  
 Request No. Req-2022-1095

9. Level linearity including the level range control

UUC Setting	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST A					
UUC Range	42.9	43.2	0.3		1.1
17-139	114	114.0	0.0	0.3	1.1

10. Tone burst response

UUC Setting	STD Tonerburst (ms)	Anticipated Ref (dB)		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		Ref (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
A / 37-139							
UUC Time Response	200	135.0	0.0				
Fast	2	118.0	0.0				
	0.25	109.0	-0.2				
Slow	200	128.6	-0.1				
	2	108.0	-0.2				
SEL	200	129.0	0.0				
	2	108.0	0.0				
	0.25	100.0	-0.1				

11. Peak C Sound level

UUC Setting	Anticipated REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST / C / 95-142					
STD Setting	137.4	136.9	-0.50		3.0
Complete cycle	136.4	136.2	-0.20	0.2	2.0
Positive half cycle	136.4	136.2	-0.20		2.0
Negative half cycle	136.4	136.2	-0.20		2.0

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The results related only to the item specified. The certificate shall not be reproduced except in full, without written approval of the Laboratory. Page 5 of 6

## Certificate of Calibration

### Customer

Name UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. Certificate No : 22-ACT-103  
Address 81 Soi 1 Idomsok 43, Sukhumvit Road, Bangchak, Prakanong, Bangkok Request No : Req-2022-0230  
10260

### Unit Under Calibration Details

Measurement Item : Sound Level Meter Microphone Class : 2  
Manufacturer : LARSON DAVIS Microphone Model : 375A04  
Model : LX12 Microphone SN : 328668  
Serial Number : 0005402 Preamp Model : PRA1A12C  
ID : UAE:EFN 0382564 Preamp SN : 071540  
Resolution : 0.1 dB Instrument Status : Used

### Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 kPa ± 10 hPa  
Received Date : 31 January 2022  
Calibrated Date : 31 February 2022

Calibration Procedure : In-house method (P-SLM-01) based on IEC 61672-3 : 2013 Electromechanical - Sound level meters - Part 3: Periodic tests

### Location of Calibration

Lab Acoustic

### Reference Standard

Instrument	Brand	Model	SN	Date calibration	Traceability
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Multi-frequency Calibrator	Quest	Questcal	EFA009234	14 June 2022	TSI
Audio Generator	Sonytek	Syn601	131	18 October 2022	WKC Electric

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

### 12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance Limit
FAST : A : 37-139	UUC	(± dB)	(± dB)
STD Setting	(dB)		
Positive one-half cycle	142.1		
Negative one-half cycle	141.9		
Deviated	0.2	0.2	1.5

### 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance Limit
FAST : A : 37-139	UUC	(± dB)	(± dB)
STD Setting	(dB)		
Initial	138.0		
Final	139.0		
Deviated	0.0	0.1	0.1

### End of Certificate

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PRA-008-SLM-01 Rev.01 Issue Date: 01/07/21

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Certificate No 22-ACT-103  
Request No Req-2022-0230

1. Indication at the calibration check frequency

UUC Setting	Nominal Level	Before Adjust		Adjust		Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)	
FAST / 37-139						
Calibrator Setting						
1000 Hz 114.00 dB	113.95	114.0	+0.15	113.9	0.05	0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN:58079

2. Self-generated noise, Microphone installed

UUC Setting	Measured		UNCERTAINTY (± dB)
	FAST / 37-139	UUC (dB)	
UUC Weighting			
A	28.1	0.10	

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured		UNCERTAINTY (± dB)
	FAST / 37-139	UUC (dB)	
UUC Weighting			
A	28.1	0.10	
C	27.9	0.10	
Z	34.4	0.10	

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve				Acceptance Limit (± dB)
	A		Z		
FAST / 37-139					
STD Setting	(dB)	(dB)	(dB)	(dB)	
125 Hz	0.0	0.1	0.1	0.50	2.0
1000 Hz	0.0	0.0	0.0	0.60	1.0
4000 Hz	0.9	0.9	1.0	0.60	3.0
8000 Hz	0.7	0.7	0.8	0.70	5.0

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PN-208-SL-34-01 Rev.0 Issue date 01/07/19

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Certificate No 22-ACT-103  
Request No Req-2022-0230

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Response curve				UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	A (dB)		C (dB)			
FAST 137-139						
STD Setting						
63 Hz	-0.2	0.0	0.0	0.0	0.2	2.0
125 Hz	-0.1	0.0	0.0	0.0		1.5
250 Hz	-0.1	0.0	0.0	0.0		1.5
500 Hz	-0.1	0.0	0.0	0.0		1.5
1000 Hz	0.0	0.0	0.0	0.0		1.0
2000 Hz	0.0	0.1	0.0	0.0		2.0
4000 Hz	0.0	0.0	0.0	0.0		3.0
8000 Hz	0.0	0.0	0.0	0.0		5.0
16000 Hz	-0.1	-0.1	-0.1	-0.1		15, -INF.

6. Frequency and time weightings at 1kHz

UUC Setting	STD		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	REF	(dB)	UUC (dB)	ERR (dB)		
FAST / 37-139						
UUC Weighting						
A	114.00	114.00	114.0	0.0	0.2	0.2
C	114.00	114.00	114.0	0.0	0.2	0.2
Z	114.00	114.00	114.0	0.0	0.2	0.2

UUC Setting	STD		Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	REF	(dB)	UUC (dB)	ERR (dB)		
37-139 / A						
UUC Time Response						
Fast	114.00	114.00	114.0	0.0	0.1	0.1
Slow	114.00	114.00	114.0	0.0	0.1	0.1
Leq	114.00	114.00	114.0	0.0	0.1	0.1

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Meas. Cond.	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	EQC Setting FAST 'A' 37-139	EQC (dB)		
STD Setting				
Initial		114.0		
Final		114.0		
Degraded		0.0	0.1	0.3

0. Level linearity on the reference level range					UNCERTAINTY {± dB}	Acceptance Limit (± dB)	
UUC Setting		Anticipated		Deviation			
		REF (dB)	UUC (dB)	ERR (dB)			
FAST 'A' 137-139							
	STD dB						
	135.00	139	135.0	0.0		1.1	
	134.00	134	134.0	0.0		1.1	
	129.00	129	129.0	0.0		1.1	
	124.00	124	124.0	0.0		1.1	
	119.00	119	119.0	0.0		1.1	
	114.00	114	114.0	0.0		1.1	
	109.00	109	109.0	0.0		1.1	
	104.00	104	104.0	0.0		1.1	
	99.00	99	99.0	0.0		1.1	
	94.00	94	94.0	0.0		1.1	
	89.00	89	89.0	0.0		1.1	
	84.00	84	84.0	0.0		1.1	
	79.00	79	79.0	0.0		1.1	
	74.00	74	74.0	0.0		1.1	
	69.00	69	69.0	0.0		1.1	
	64.00	64	64.0	0.0		1.1	
	59.00	59	59.0	0.0		1.1	
	54.00	54	54.0	0.0		1.1	
	49.00	49	49.0	0.0		1.1	
	44.00	44	44.0	0.0		1.1	
	39.00	39	39.0	0.0		1.1	
	34.00	34	34.0	0.0		1.1	

20 Level Interferer (within the level range control)	UUC Setting		STD REF (dB)	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
	FAST / A	UUC Range		EIRC (dB)	ERR (dB)		
		37-139	114	42.9	-0.3	0.3	1.1
				114.0	0.0		1.1

UUC Setting	STD Toneburst (ms)	Anticipated		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		Ref (dB)	UUC (dB)	UUC (dB)	ERR (dB)		
Fast	200	135.0	135.0	0.0	0.3	1.0	
	2	118.0	117.7	-0.3		+1.0, -2.5	
	0.25	109.0	108.7	-0.3		+1.5, -5.0	
Slow	200	128.6	128.5	-0.1	0.3	1.0	
	2	109.0	108.9	-0.1		+1.0, -5.0	
	200	129.0	129.0	0.0		1.0	
SEL	2	109.0	109.0	0.0	0.3	+1.0, -2.5	
	0.25	100.0	99.9	-0.1		+1.5, -5.0	

2.4.1. Peak C. Binding Level	UVC Setting FAST / C. / 95-142	Anticipated		Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
		REF (dB)	UIC (dB)	ERR (dB)	ERR (dB)		
	STD Setting						
	Complete cycle	137.4	136.7	-0.70		0.2	3.0
	Positive half cycle	136.4	136.1	-0.30			2.0
	Negative half cycle	136.4	136.2	-0.20			2.0

12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance Limit
FAST / A / 37-139	UUC	(± dB)	(± dB)
STD Setting	(dB)		
Positive one-half cycle	142.2		
Negative one-half cycle	142.3		
Deviated	-0.1	0.2	1.5

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance Limit
FAST / A / 37-139	UUC	(± dB)	(± dB)
STD Setting	(dB)		
Initial	138.0		
Final	138.0		
Deviated	0.0	0.1	0.3

End of Certificate

Certificate No 22-ACCT-104  
Request No Req-2022-0232

#### 1. Indication at the calibration check frequency

UUC Setting	Nominal Level (dB)	Before Adjust		Adjust		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
FAST / A / 37-139							
Calibrator Setting							
1000 Hz 114.00 dB	113.85	114.0	±0.15	113.9	0.05	0.20	1.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SYVANTEK, Model NV 33A, SN.581079

#### 2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY (± dB)
FAST / 37-139		
UUC Weighting		
A	28.7	0.10

#### 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY (± dB)
FAST / 37-139		
UUC Weighting		
A	28.6	0.10
C	28.8	0.10
Z	34.7	0.10

#### 4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve				UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	A (dB)	C (dB)	Z (dB)			
FAST / 37-139						
STD Setting						
125 Hz	0.0	0.1	0.1	0.50	2.0	2.0
1000 Hz	0.0	0.0	0.0	0.60	1.0	1.0
4000 Hz	0.7	0.7	0.7	0.60	3.0	3.0
8000 Hz	1.0	0.9	0.8	0.70	5.0	5.0

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TM-708-SLA-01 Rev.0 Issue date 01/07/21

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Certificate No 22-ACCT-104  
Request No Req-2022-0232

#### 5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Response curve				UNCERTAINTY (± dB)	Acceptance Limit (± dB)
	A (dB)	C (dB)	Z (dB)			
FAST / 37-139						
STD Setting						
63 Hz	-0.2	0.0	0.0			2.0
125 Hz	-0.1	0.0	0.0			1.5
250 Hz	-0.1	0.0	0.0			1.5
500 Hz	-0.1	0.0	0.0			1.5
1000 Hz	0.0	0.0	0.0		0.2	1.0
2000 Hz	0.0	0.1	0.0			2.0
4000 Hz	0.0	0.0	0.0			3.0
8000 Hz	0.0	0.0	0.0			5.0
16000 Hz	-0.1	-0.1	-0.1			+5, -INF.

#### 6. Frequency and time weightings at 1kHz

UUC Setting	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
		UUC (dB)	ERR (dB)		
FAST / 37-139					
UUC Weighting					
A	114.00	114.0	0.0	0.2	0.2
C	114.00	114.0	0.0	0.2	0.2
Z	114.00	114.0	0.0	0.2	0.2
UUC Setting	STD REF (dB)	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
37-139 / A		UUC (dB)	ERR (dB)		
UUC Time Response					
Fast	114.00	114.0	0.0	0.1	0.1
Slow	114.00	114.0	0.0	0.1	0.1
Leq	114.00	114.0	0.0	0.1	0.1

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Certificate No : 22-ACCT-104  
Request No : Req-2022-0232

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance Limit
FAST : A : 37-139	UUC (dB)	( $\pm$ dB)	( $\pm$ dB)
STD Setting			
Initial	114.0		
Final	114.0		
Deviated	0.0	0.1	0.3

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation	UNCERTAINTY	Acceptance Limit
FAST : A : 37-139	REF (dB)	UUC (dB)	( $\pm$ dB)	( $\pm$ dB)
STD dB				
140.00	140	140.0	0.0	1.1
130.00	139	139.0	0.0	1.1
124.00	134	134.0	0.0	1.1
129.00	129	129.0	0.0	1.1
124.00	124	124.0	0.0	1.1
119.00	119	119.0	0.0	1.1
114.00	114	114.0	0.0	1.1
109.00	109	109.0	0.0	1.1
104.00	104	104.0	0.0	1.1
99.00	99	99.0	0.0	1.1
94.00	94	94.0	0.0	1.1
89.00	89	89.0	0.0	1.1
84.00	84	84.0	0.0	1.1
79.00	79	79.0	0.0	1.1
74.00	74	74.0	0.0	1.1
69.00	69	69.0	0.0	1.1
64.00	64	64.0	0.0	1.1
59.00	59	59.0	0.0	1.1
54.00	54	54.0	0.0	1.1
49.00	49	49.0	0.0	1.1
44.00	44	44.1	0.1	1.1
39.00	39	39.3	0.3	1.1

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FM-708-SLM-01 Rev. 0 Issue date 01-07-21

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Certificate No : 22-ACCT-104  
Request No : Req-2022-0232

9. Level linearity including the level range control

UUC Setting	STD	Measured	UNCERTAINTY	Acceptance Limit
FAST : A	REF (dB)	UUC (dB)	( $\pm$ dB)	( $\pm$ dB)
UUC Range				
	44.1	43.7	-0.4	1.1
37-139	114	114.0	0.0	1.1

10. Tone burst response

UUC Setting	Anticipated	Measured	UNCERTAINTY	Acceptance Limit
A : 37-139	Timeburst (ms)	UUC (dB)	ERR (dB)	( $\pm$ dB)
UUC Time Response				
	200	135.0	0.0	1.0
Fast	2	118.0	-0.1	+1.0, -2.5
	0.25	109.0	-0.3	+1.5, -5.0
Slow	200	128.6	-0.1	1.0
	2	109.0	-0.2	+1.0, -5.0
	200	129.0	0.0	1.0
SEL	2	109.0	+0.1	+1.0, -2.5
	0.25	100.0	-0.3	+1.5, -5.0

11. Peak C Sound level

UUC Setting	Anticipated	Measured	UNCERTAINTY	Acceptance Limit
FAST : C : 95-142	REF (dB)	UUC (dB)	( $\pm$ dB)	( $\pm$ dB)
STD Setting				
Complete cycle	137.4	136.7	-0.70	3.0
Positive half cycle	136.4	136.2	-0.20	2.0
Negative half cycle	136.4	136.2	-0.20	2.0

The results released only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd

FM-708-SLM-01 Rev. 0 Issue date 01-07-21

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Certificate No 21-ACCT-361  
Request No Rsp2021-1241

### 1. Absolute acoustical sensitivity

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref	UUC (s)	Ref (Pa h)	Error (%)	
FAST A / 60-140					
Calibrator Setting					
1000 Hz 114 dB	120.06	120	3.23	-0.93	3.0
					-21. -26

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN. 50079

### 2. Frequency weightings

UUC Setting	Deviation from various Frequency Weighting		Tolerances Limit (± dB)
	A	C	
FAST A / 60-140			
SYN Setting			
63 Hz	-1.0	-1.0	2.0
125 Hz	-0.4	-0.3	1.5
250 Hz	-0.1	-0.1	1.5
500 Hz	-0.1	0.0	1.5
1000 Hz	0.0	0.0	-
2000 Hz	0.0	0.1	2.0
4000 Hz	-0.8	-0.8	3.0
8000 Hz	-2.1	-2.1	5.0

Certificate No 21-ACCT-361  
Request No Rsp2021-1241

### 3. Linearity of response to steady signals

#### a. Sound exposure meter, linearity of response for changes of input sinusoidal signal level

UUC Setting	FAST A / High											
	Ref	(dB)	60.0	80.0	90.0	100.0	110.0	114.0	120.0	130.0	140.0	
1000 Hz	Level A	(dB)	60.6	80.3	90.0	100.0	110.0	114.0	120.0	130.0	140.0	
	Error	(dB)	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8000 Hz	Ref	(dB)			88.9	98.9	108.9	112.9	118.9	128.9	138.9	
	Level A	(dB)			88.9	98.9	108.9	112.9	118.9	128.9	138.9	
	Error	(dB)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
63 Hz	Ref	(dB)						87.8	93.8	103.8	113.8	
	Level A	(dB)						87.8	93.8	103.8	113.8	
	Error	(dB)						0.0	0.0	0.0	0.0	
Tolerances Limit	(±dB)							1.0				
UNCERTAINTY	(±dB)							0.27				

#### b. Sound exposure meter linearity of error

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref	UUC (s)	Ref (Pa h)	Error (%)	
FAST A / 60-140					
Calibrator Setting					
1000 Hz 110 dB	27	27	0.30	0.10	0.00
1000 Hz 110 dB	45	45	0.50	0.09	
1000 Hz 110 dB	90	90	1.00	-1.00	
1000 Hz 110 dB	180	180	2.00	-1.00	
1000 Hz 120 dB	36	36	4.00	-4.03	
1000 Hz 120 dB	72	72	8.00	-0.63	
1000 Hz 120 dB	90	90	10.00	-1.30	
1000 Hz 120 dB	180	180	20.00	-1.10	
1000 Hz 120 dB	360	360	40.00	-0.65	
1000 Hz 120 dB	720	720	80.00	-0.61	
				4.3	
				3.8	
					-21. -26

Certificate No: 21-ACF-261  
 Request No: Req-2022-0324

4. Response to short duration

a. Response for sinusoidal signals - reference level

UUC Setting	Time		Exposure Measurement		UNCERTAINTY (%)	Tolerances Limit (%)
	Ref	UUC (s)	Ref (Pa <sup>2</sup> h)	UUC (Pa <sup>2</sup> h)		
FASST A: 60-140 Calibrator Setting 4000 Hz 95 dB	2846	2846	1.00	0.99	0.01	-0.29 ~ +0.41

b. Sound exposure meter response for series of toneburst impulses

UUC Setting	Time		Exposure Measurement		UNCERTAINTY (%)	Tolerances Limit (%)
	Ref	UUC (s)	Ref (Pa <sup>2</sup> h)	Error (%)		
FASST A: 60-140 Calibrator Setting	2846	2846	1.00	-1.00	0.0	-21 ~ +26
Burst 1 ms, 95 dB	990	990	1.00	-1.00	0.0	-21 ~ +41
Burst 1 ms, 108 dB	143	143	1.00	-1.00	0.0	-21 ~ +41

5. Response to unipolar pulse

UUC Setting	Time		Exposure Measurement		UNCERTAINTY (%)	Tolerances Limit (%)
	Ref	UUC (s)	Ref (Pa <sup>2</sup> h)	Different (%)		
FASST A: 60-140 Calibrator Setting Continuous Rectangle Continuous Rectangle -	2	2	0.61	0.00	2.4	-21 ~ +26

End of Certificate

Certificate of Calibration

Customer: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD  
 Name: B1 Set Udonrak-41, Subharnoi Road, Bangkok, Prachuab, Bangkok 10260  
 Address: Certificate No: 22-ACF-114  
 Request No: Req-2022-0321

Unit Under Calibration Details

Measurement Item:	Nose deslender	Microphone Class:	2
Manufacturer:	SVANTEK	Microphone Model:	SV27
Model:	SV104	Microphone S/N:	96604
Serial Number:	91923	Preamplifier Model:	-
ID:	-	Preamplifier S/N:	-
Resolution:	0.1 dB	Instrument Status:	Used

Calibration Environment and Details

Temperature:	23 °C ± 2 °C
Humidity:	50 %RH ± 20 %RH
Barometric Pressure:	1013 hPa ± 10 hPa
Received Date:	14 February 2022
Calibration Date:	17 February 2022
Calibration Procedure:	In-house method (TS-NIEM-01) based on IEC 61252: 2017
Location of Calibration:	Lab Acoustic

Reference Standard

Instrument	Brand	Model	S/N	Date calibration	Traceability
Multi-frequency Calibrator	Quest	Questcal	188272	14 June 2022	TSI
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Sine Generator	Svanteck	Svanteck	131	18 October 2022	WK Electric
Timer	EXTECH	-	05-AC7	29 March 2022	IPA

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k = 2, providing a level of confidence approximately 95 %.

1. Absolute acoustical sensitivity

UUC Setting	Time	Exposure Measurement	Tolerances
FAST / A / 55-140	Ref	UUC	Limit
Calibrator Setting	(s)	(Pa <sup>2</sup> /h)	(%)
1000 Hz 114 dB	120	3.23	-0.93

Note:

Absolute sensitivity was established by the use of Sound Calibrator Brand SVAN (UK, Model SV 350, SN: 50079)

2. Frequency weightings

UUC Setting	Deviation from various	Tolerances
FAST / 55-140	Frequency Weighting	Limit
STD Setting	A	(± 0.0)
93 Hz	(dB)	2.0
125 Hz	-0.1	1.5
250 Hz	-0.2	1.5
500 Hz	-0.2	1.5
1000 Hz	0.0	-
2000 Hz	0.0	2.0
4000 Hz	1.2	3.0
8000 Hz	-1.4	5.0

3. Linearity of response to steady signals

a. Sound exposure meter linearity of response for changes of input sinusoidal signal level

UUC Setting	Ref	55.0	80.0	90.0	100.0	110.0	114.0	120.0	130.0	140.0
1000 Hz	Level A	54.5	79.9	90.1	100.0	110.0	114.0	120.0	130.0	140.0
	Error	-0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8000 Hz	Ref	88.9	96.9	108.9	112.9	118.9	128.9	138.9		
	Level A	88.9	96.9	108.9	112.9	118.9	128.9	138.9		
	Error	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	
63 Hz	Ref						87.8	93.8	103.8	113.8
	Level A						87.8	93.8	103.8	113.8
	Error						0.0	0.0	0.0	0.0
Tolerances Limit	(±dB)									
UNCERTAINTY	(±dB)									

b. Sound exposure meter linearity of error

UUC Setting	Time	Exposure Measurement	Tolerances
FAST / A / 55-140	Ref	UUC	Limit
Calibrator Setting	(s)	(Pa <sup>2</sup> /h)	(%)
1000 Hz 110 dB	27	0.30	0.00
1000 Hz 110 dB	45	0.50	-2.00
1000 Hz 110 dB	90	1.00	+1.00
1000 Hz 110 dB	180	2.00	-1.00
1000 Hz 120 dB	36	4.00	-1.50
1000 Hz 120 dB	72	8.00	-1.65
1000 Hz 120 dB	90	10.00	-1.00
1000 Hz 120 dB	180	20.00	-1.20
1000 Hz 120 dB	360	40.00	-1.45
1000 Hz 120 dB	720	80.00	-1.68

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Impacmet Instrument Co., Ltd

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เอกสารไม่ควบคุม

Certificate No : 22-ACT-114  
Request No : Req-2022-0331

Certificate of Calibration

Customer : UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Certificate No : 22-ACT-033

Address : 81 Soi Udomsak-41, Sukhumvit Road, Bangkok, Prakanong, Bangkok 10260

Request No : Req-2022-0991

4. Response to short duration  
a. Response for sinusoidal signals - reference level

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref (s)	UUC (s)	Ref (Pa h)	Error (Pa h)	
FAST / A : 55-140 Calibrator Setting 4000 Hz 95 dB	2846	2846	1.00	-0.01	-0.29 ~ +0.41

b. Sound exposure meter response for series of toneburst impulses

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref (s)	UUC (s)	Ref (Pa h)	Error (%)	
FAST / A : 55-140 Calibrator Setting Burst 1 ms, 95 dB	2846	2846	1.00	-1.00	-21 ~ +26
Burst 1 ms, 100 dB	980	980	1.00	-1.00	-21 ~ +41
Burst 1 ms, 105 dB	143	143	1.00	+1.00	-21 ~ +41

5. Response to unipolar pulse

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref (s)	UUC (s)	Ref (Pa h)	Different (%)	
FAST / A : 55-140 Calibrator Setting Continuous Rectangle - Continuous Rectangle -	7	7	10.61 10.61	0.00	-21 ~ +26

\* Indicates non accredited

End of Certificate

Instrument	Brand	Model	SN	Due calibration	Traceability
Multi-frequency Calibrator	Quest	Questcal	188272	14 June 2022	TSI
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Sine Generator	Stanek	Stanek	131	18 October 2022	WK Electric
Timer	EXTech	-	05-ACT	29 March 2022	TEA

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

เอกสารไม่ควบคุม

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.  
เอกสารไม่ควบคุม  
Date 01/07/19





Certificate No: 22-AC-1413  
 Request No: Req-2022-0091

### 1. Absolute acoustical sensitivity

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref	UUC	Ref	Error	
FAST / A / 55-140	(s)	(s)	(Pa <sup>2</sup> /h)	(%)	
Calibrator Setting	120.00	420	3.23	-0.53	-21, +26

Note: Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN: 38879

### 2. Frequency weightings

UUC Setting	Deviation from various Frequency Weighting		Tolerances Limit (%)
	A	C	
FAST / 55-140	(dB)	(dB)	(± dB)
STD Setting	-0.3	-0.3	2.0
63 Hz	-0.2	-0.2	1.5
125 Hz	-0.2	-0.1	1.5
250 Hz	-0.2	-0.2	1.5
500 Hz	0.0	0.0	1.5
1000 Hz	0.4	0.5	2.0
2000 Hz	0.2	0.2	3.0
4000 Hz	-1.8	-1.9	5.0



Certificate No: 22-AC-1413  
 Request No: Req-2022-0091

### 3. Linearity of response to steady signals

#### a. Sound exposure meter, linearity of response for changes of input sinusoidal signal level

UUC Setting	FAST / A / High								
	Ref	(dB)	55.0	80.0	90.0	100.0	110.0	130.0	140.0
1000 Hz	Level A	(dB)	54.2	80.1	90.1	100.1	110.1	120.0	130.0
	Error	(dB)	-0.8	0.1	0.1	0.1	0.1	0.0	0.0
8000 Hz	Ref	(dB)							
		(dB)			88.9	98.9	108.9	118.9	128.9
	Level A	(dB)			88.9	98.9	108.9	118.9	128.9
	Error	(dB)			88.9	98.9	108.9	118.9	128.9
63 Hz	Ref	(dB)							
	Level A	(dB)							
	Error	(dB)							
Tolerances Limit		(dB)							
		(dB)							
UNCERTAINTY		(dB)							

#### b. Sound exposure meter linearity of error

UUC Setting	Time		Exposure Measurement		Tolerances Limit (%)
	Ref	UUC	Ref	Error	
FAST / A / 55-140	(s)	(s)	(Pa <sup>2</sup> /h)	(%)	
Calibrator Setting	27	27	0.30	0.30	0.00
1000 Hz 110 dB	45	45	0.50	0.50	0.00
1000 Hz 110 dB	90	90	1.00	1.01	+1.00
1000 Hz 110 dB	180	180	2.00	2.02	+1.00
1000 Hz 120 dB	206	206	4.00	4.03	+0.75
1000 Hz 120 dB	412	412	8.00	8.05	+0.63
1000 Hz 120 dB	824	824	16.00	16.13	+1.20
1000 Hz 120 dB	1648	1648	32.00	32.22	+1.10
1000 Hz 120 dB	3296	3296	64.00	64.34	+0.85
1000 Hz 130 dB	720	720	80.00	80.49	+0.61

Certificate No 22-ACT-033  
Request No Req-2022-0691

4. Response to short duration

a. Response for sinusoidal signals - reference level

UUC Setting		Time		Exposure Measurement		Tolerances	
Ref	UUC	Ref	UUC	Error	UNCERTAINTY	Limit	
FAST A / 55-140	(s)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	
Calibrator Setting							
-4000 Hz 95 dB	2846	2846	0.98	-0.01	0.01	-0.20 - 0.41	

b. Sound exposure meter response for series of toneburst impulses

UUC Setting		Time		Exposure Measurement		Tolerances	
Ref	UUC	Ref	UUC	Error	UNCERTAINTY	Limit	
FAST A / 55-140	(s)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	(%)	(%)	(%)	
Calibrator Setting							
Burst 1 ms, 95 dB	2846	1.00	0.99	-1.00		-21 - +26	
Burst 1 ms, 100 dB	900	1.00	1.00	0.00	3.0	-21 - +41	
Burst 1 ms, 108 dB	143	1.00	1.00	0.00		-21 - +41	

5. Response to unipolar pulse

UUC Setting		Time		Exposure Measurement		Tolerances	
Ref	UUC	Ref	UUC	Different	UNCERTAINTY	Limit	
FAST A / 55-140	(s)	(Pa <sup>2</sup> h)	(Pa <sup>2</sup> h)	(%)	(%)	(%)	
Calibrator Setting							
Continuous Rectangle +	7	10.86		0.00	2.4	-21 - +26	
Continuous Rectangle -		19.86					

\* Indicates non accredited

End of Certificate

Certificate of Calibration

Customer

Name : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD Certificate No 21-ACT-326  
Address : 81 Soi Udomsak 41, Sukhumvit Road, Itanagehuk, Request No Req-2021-0994  
Prakanong, Bangkok 10260

Unit Under Calibration Details

Measurement item : Acoustic Calibrator Class :  
Manufacturer : SVANTEK Range : 94 , 114 dB / 1000 Hz  
Model : SV36 Instrument Status : Used  
Serial Number : 107224  
ID : UAE.EFM.171/2514

Calibration Environment and Details

Temperature : 23 ±2 °C )  
Humidity : 450 ± 20 %RH )  
Barometric Pressure : 1013 ±0.0 hPa )  
Received Date : 22 July 2021  
Calibration Date : 24 August 2021

Location of Calibration : LAB 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electromechanics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEL	14 May 2022
THD Multimeter	2015	1047765	NIMT	21 January 2022

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Certificate No. : 21-ACT-326	Request No. : Req-2021-0904
------------------------------	-----------------------------

Sound pressure level	Calibration Results : Without Adjustment						
	Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty ( $\pm$ dB)	Acceptance limit Class 1 ( $\pm$ dB)
		Measured	Error	Measured	Error		
94 dB / 1000 Hz		94.08	0.08	-	-	0.11	0.25
114 dB / 1000 Hz		114.13	0.13	-	-	0.11	0.25

## Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (Hz)	Error (%)	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	999.96	0.004	-	-	0.10	0.70
114 dB / 1000 Hz	999.98	0.002	-	-	0.10	0.70

## Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment	Adjustment	Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (%)	Measured (%)		
94 dB / 1000 Hz	0.43	-	0.40	2.5
114 dB / 1000 Hz	0.35	-	0.40	2.5

**Note:**

Accepted for publication 14 July 2005

- The calibration results exclude the calibration pressure correction

The calibration results exclude the microphene volume correction

## End of Calibration



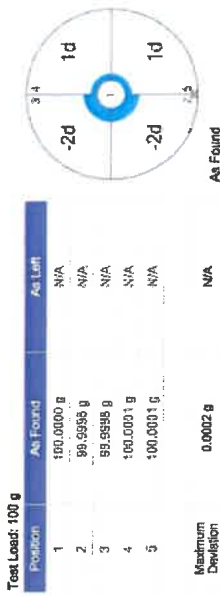
## Measurement Results

### Repeatability

Test Load: 100 g				
	As Found	As Left	As Found	As Left
1	99.9999 g	N/A	99.9999 g	N/A
2	100.0000 g	N/A	99.9998 g	N/A
3	99.9998 g	N/A	100.0000 g	N/A
4	100.0000 g	N/A	99.9999 g	N/A
5	99.9999 g	N/A	100.0000 g	N/A
6	100.0000 g	N/A	99.9998 g	N/A
7	99.9998 g	N/A	100.0001 g	N/A
8	100.0001 g	N/A	99.9999 g	N/A
9	99.9999 g	N/A	100.0000 g	N/A
10	100.0000 g	N/A		
Standard Deviation	0.00008 g	N/A		

The "g" in the graph represents the readability of the range interval at which the test was performed.  
The results of the graph are based upon the absolute values of the difference from the mean value.

### Eccentricity



The "d" in the graph represents the readability of the range interval in which the test was performed.

## Error of Indication

As Found	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.18 mg	2
2	0.1000 g	0.1000 g	0.0000 g	0.18 mg	2
3	1.0000 g	0.9999 g	-0.0001 g	0.18 mg	2
4	5.0000 g	5.0000 g	0.0000 g	0.18 mg	2
5	10.0000 g	9.9999 g	-0.0001 g	0.20 mg	2
6	20.0000 g	20.0000 g	0.0000 g	0.21 mg	2
7	50.0000 g	50.0000 g	0.0000 g	0.23 mg	2
8	70.0001 g	70.0000 g	-0.0001 g	0.28 mg	2
9	100.0000 g	100.0000 g	0.0000 g	0.29 mg	2
10	150.0000 g	150.0002 g	0.0002 g	0.40 mg	2
11	200.0001 g	200.0003 g	0.0002 g	0.46 mg	2

As Found

As Left



For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty states the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor  $k=2$  according to EURAMET cg-18. The value of the measured lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

## Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

### Weight Set 1: OIML E2

Weight Set No.	WS80	Date of Issue	23-Feb-2022
Certificate Number	C208581831	Calibration Due Date	14-Aug-2023

### Themo Hygrometer

Equipment No.	IM161	Date of Issue	14-Jun-2021
Certificate Number	21H1220	Calibration Due Date	01-Jun-2022



Remarks

Equipment Condition: Good  
Next calibration according to customer's procedure  
Calibration data not decide by calibration laboratory  
Test weight by Filer pan : 1 g = 0.9999 g, 3 g = 3.0000 g, 5 g = 5.0000 g

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use  $3,0 \cdot 10^{-7} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use 3 K

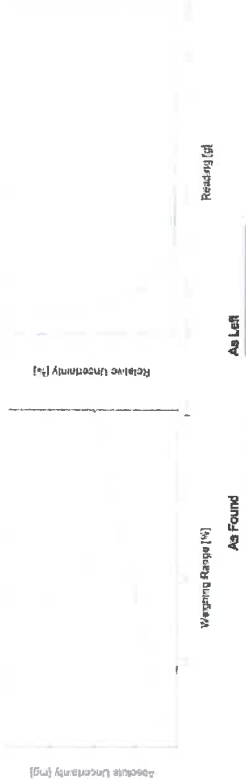
Uncertainties of Uncertainty Equation

Range	Min	Max	As Found	As Left
1	0.0001 g	220 g	$U_1 = 0.19 \text{ mg} + 0.00817 \text{ mg/g} \cdot R$	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.0020 g	0.19 mg	N/A
0.2200 g	0.19 mg	0.087%
2.2000 g	0.21 mg	0.0095%
22.0000 g	0.37 mg	0.0017%
220.0000 g	2.0 mg	0.00090%



Mettler-Toledo (Thailand) Ltd.  
846/4 - 846/5 Lasele Rd., Bangna Tai Sub-District  
Bangna District, Bangkok 10260  
+66 2723 0382  
MT-TH.ServiceSupport@mt.com



## Accuracy Calibration Certificate

### Customer

Company: Unifor Analysis and Engineering Consultant Co., Ltd.  
Address: 3 Soi Udom Suk 41, Sukhumvit Rd., Bang Chak  
City: Prus Khannang  
Zip / Postal: 10260  
State / Province: Bangkok  
Order Number: 10260  
Contact: Smit Chomok



### Weighing Device

Manufacturer: Mettler Toledo  
Model: AB204-SFACT  
Serial No.: B108115863  
Building: N/A  
Floor: 2  
Room: Balance Room 2 (206)  
Instrument Type: Weighing Instrument  
Asset Number: UAE-AIR-0162955  
Terminal Model: N/A  
Terminal Serial No.: N/A  
Terminal Asset No.: N/A

Range	Max. Capacity	Repeatability (g)
1	220 g	0.0001 g

### Procedure

Calibration Guidelines: EURAMET cg-18 v. 4.0 (11/2015)  
CPV002/220

METTLER TOLEDO Work Instruction:  
This calibration certificate contains measurements for As Found and As Left calibrations.  
The sensitivity of the weighing instrument was adjusted before As Found and As Left calibrations with a built-in weight.  
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

	Temperature		Humidity	
	Start	End	Start	End
As Found	22.6 °C	22.1 °C	56.0 %	51.9 %
As Left	22.3 °C	22.4 °C	46.2 %	55.8 %

As Found Calibration Date: 07-Apr-2022  
As Left Calibration Date: 07-Apr-2022  
Issue Date: 09-Apr-2022

Approved Signatory:



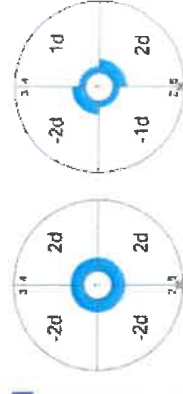
## Measurement Results Repeatability

Test Load: 100 g	As Found	As Left
1	100.0005 g	99.9999 g
2	100.0004 g	100.0000 g
3	100.0004 g	99.9999 g
4	100.0006 g	100.0000 g
5	100.0005 g	99.9999 g
6	100.0004 g	99.9998 g
7	100.0005 g	100.0000 g
8	100.0004 g	100.0000 g
9	100.0005 g	100.0000 g
10	100.0005 g	100.0000 g
Standard Deviation	0.00007 g	0.00007 g

The "g" in the graph represents the readability of the range/interval in which the test was performed.  
The results of the graph are based upon the absolute values of the differences from the mean value.

## Eccentricity

Test Load: 100 g	Position	As Found	As Left
1	1	100.0005 g	100.0000 g
2	2	100.0003 g	99.9999 g
3	3	100.0003 g	99.9998 g
4	4	100.0007 g	100.0001 g
5	5	100.0007 g	100.0002 g
Maximum Deviation		0.0002 g	0.0002 g

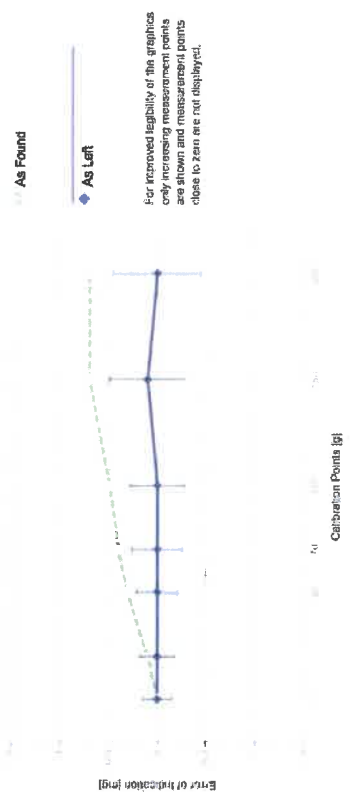


The "g" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

As Found	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.15 mg	2
2	0.1000 g	0.1001 g	0.0001 g	0.16 mg	2
3	1.0000 g	0.9999 g	-0.0001 g	0.16 mg	2
4	5.0000 g	5.0000 g	0.0000 g	0.16 mg	2
5	10.0000 g	10.0001 g	0.0001 g	0.17 mg	2
6	20.0000 g	20.0001 g	0.0001 g	0.18 mg	2
7	50.0000 g	50.0003 g	0.0003 g	0.20 mg	2
8	70.0001 g	70.0005 g	0.0004 g	0.26 mg	2
9	100.0000 g	100.0005 g	0.0005 g	0.27 mg	2
10	150.0000 g	150.0007 g	0.0007 g	0.36 mg	2
11	200.0001 g	200.0008 g	0.0007 g	0.44 mg	2

As Left	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.15 mg	2
2	0.1000 g	0.1000 g	0.0000 g	0.16 mg	2
3	1.0000 g	0.9999 g	-0.0001 g	0.17 mg	2
4	5.0000 g	5.0000 g	0.0000 g	0.17 mg	2
5	10.0000 g	10.0000 g	0.0000 g	0.17 mg	2
6	20.0000 g	20.0000 g	0.0000 g	0.18 mg	2
7	50.0000 g	50.0000 g	0.0000 g	0.21 mg	2
8	70.0001 g	70.0001 g	0.0000 g	0.26 mg	2
9	100.0000 g	100.0000 g	0.0000 g	0.26 mg	2
10	150.0000 g	150.0001 g	0.0001 g	0.39 mg	2
11	200.0001 g	200.0001 g	0.0000 g	0.45 mg	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor  $k$  – which can be larger than 2 according to EURAMET Cp-16. The value of the measured lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2			
Weight Set No.	WS80	Date of Issue:	23-Feb-2022
Certificate Number	C208561631	Calibration Due Date:	14-Aug-2023
Thermo Hygrometer			
Equipment No.:	IN161	Date of Issue:	14-Jun-2021
Certificate Number	21H1220	Calibration Due Date:	01-Jul-2022

Remarks

FACT adjustment, functionality activated  
Value of the built-in weight adjusted  
Equipment condition: Good  
Next calibration according to customer's procedure  
Calibration data not decide by calibration laboratory  
Test weight by Filter pan: 1 g = 1.0000 g, 3 g = 3.0000 g, 5 g = 5.0000 g

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

## Measurement Uncertainty of the Weighing Instrument in Use

Stated as the expanded uncertainty with  $k=2$  in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value  $F$  represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use  $2.5 \cdot 10^{-4} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use:  $3 K$

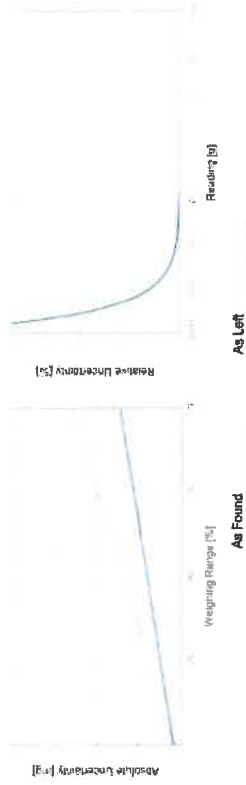
## Uncertainty of Uncertainty Equation

	Range	d	Max	As Found	As Left
1	0.0001 g	220 g		$U_1 = 0.16 \text{ mg} + 0.0113 \text{ mg/g} \cdot R$	$U_1 = 0.16 \text{ mg} + 0.00992 \text{ mg/g} \cdot R$

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

## Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.0220 g	0.16 mg	0.16 mg
0.2200 g	0.16 mg	0.16 mg
2.2000 g	0.18 mg	0.17 mg
22.0000 g	0.40 mg	0.29 mg
220.0000 g	2.8 mg	1.5 mg



DQE Services Co., Ltd.

32 Soi Ladprao-Wanghin 55, Ladprao-Wanghin Rd., Ladprao, Bangkok 10230

Phone : +66 (0)2 518 2054, Email : dqeserviceinfo@gmail.com



## CERTIFICATE OF CALIBRATION

Certificate No. : SP22-016

Page 1 of 5

Customer : United Analyst and Engineering Consultant Co., Ltd. (Head Office)

Address : 3 Soi Udomsuk 41, Sukhumvit Road, BANGKOK, Phrakhanong,

Bangkok 10260

Location of calibration : Laboratory 315

Equipment : UV-Vis Spectrophotometer

Manufacturer : Agilent Technologies

Model : Cary 60

Serial No. : MY15410009

ID No. : N/A

Received Date : 23 May 2022

Calibration Date : 23 May 2022

Issue Date : 26 May 2022

Condition Instrument : Good

The measurement capability of the laboratory and its traceability to recognized national standards and to the unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the DQE Services Co., Ltd.

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PM-708-02 R01 1/11/2021

FM-708-02 R01 1/11/2021



## REPORT OF CALIBRATION

Certificate No. : SP22-016

Page 4 of 5

### Photometric Accuracy :

Wavelength (nm.)	CRMs Values (Abs)	UUC Reading (Abs)	Correction (Abs)	Uncertainty (Abs)	Coverage factor $k$
235	0.0000 0.7478	0.0001 0.7421	-0.0001 0.0057	0.0050 0.0056	2.00 2.00
257	0.0000 0.8686	0.0000 0.8619	0.0000 0.0067	0.0050 0.0059	2.00 2.00
313	0.0000 0.2912	0.0000 0.2896	0.0000 0.0016	0.0050 0.0051	2.00 2.00
350	0.0000 0.6448	0.0000 0.6403	0.0000 0.0045	0.0050 0.0055	2.00 2.00

## REPORT OF CALIBRATION

Certificate No. : SP22-016

Page 5 of 5

### Wavelength Accuracy :

CRMs Values (nm.)	UUC Reading (nm.)	Correction (nm.)	Uncertainty (nm.)	Coverage factor $k$
241.72 279.45 287.81 334.06 360.93 418.59 445.94 453.66 460.02 536.59 637.98	242.0 279.5 287.5 333.5 360.5 418.0 445.4 453.2 459.7 536.2 638.3	-0.28 -0.05 0.31 0.56 0.43 0.59 0.54 0.46 0.32 0.39 -0.32	0.18 0.18 0.18 0.18 0.18 0.18 0.18 0.18 0.18 0.18 0.18	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00
431.38 472.50 513.47 528.88 573.17 585.35 684.40 740.72 748.55 807.03 879.28	431.0 472.5 513.5 528.5 573.0 585.0 684.7 740.8 748.5 807.3 879.0	0.38 0.00 -0.03 0.38 0.17 0.35 -0.30 -0.08 0.05 -0.27 0.28	0.18 0.18 0.18 0.18 0.18 0.20 0.18 0.20 0.18 0.18 0.18	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00

Remark : - UUC = Unit Under Calibration

- N/A = Not Available

- The result expanded uncertainty of measurement  $U$  is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$ .

which for a normal distribution corresponds to a coverage probability of approximately 95%

- \* Indicates non TISI accredited

เอกสารไม่ควบคุม

- End of Certificate -

เอกสารไม่ควบคุม

## CERTIFICATE OF CALIBRATION

Certificate No. : SP22-007

Page 1 of 5

Customer : United Analyst and Engineering Consultant Co., Ltd. (Head Office)

Address : 3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong,

Bangkok 10260

Location of calibration : Laboratory 315

Equipment : UV-Vis Spectrophotometer

Manufacturer : Hitachi

Model : U-1900

Serial No. : 2021-064

ID No. : UAE.WAS.006/2552

Received Date : 20 January 2022

Calibration Date : 20 January 2022

Issue Date : 24 January 2022

Condition Instrument : Good

The measurement capability of the laboratory and its traceability to recognized national standards and to the unit of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the DQE Services Co., Ltd.

PN4-708-02 R01 1/1/2021

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## REPORT OF CALIBRATION

Certificate No. : SP22-007

Page 2 of 5

Environment Condition : Ambient Temperature  $25 \pm 5$  °C

Relative humidity  $55 \pm 20$  %RH

Calibration method : In-house method CP-01 Based on ASTM E275-08

Certified Reference Materials :

Material	Serial No.	Certificate No.	Due date
Absorbance Standard set	25760	95935	22 October 2023
Absorbance Standard set	25757	95929	22 October 2023
Wavelength Standard set	25806	95916	22 October 2023
Wavelength Standard set	25758	95915	22 October 2023

Traceability This certification is traceable to the International System of Unit maintained at National -

Institute of Standards and Technology (NIST) through Siarna Scientific Limited

Spectral Band Width of UUC : 4.0 nm.

Scan Speed of UUC : 200 nm/min

Scan Interval of UUC : 0.1 nm.

Resolution of UUC : Photometric 0.001 Abs.

Wavelength 0.1 nm.

PN4-708-02 R01 1/1/2021

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## REPORT OF CALIBRATION

Certificate No. SP22-007

Page 3 of 5

Calibration Results : Without adjustment

Photometric Accuracy :

Wavelength (nm.)	CRMs Values (Abs)	UUC Reading (Abs)	Correction (Abs)	Uncertainty (Abs)	Coverage factor k
420	0.0000	0.000	0.0000	0.0028	2.00
	0.5787	0.577	0.0017	0.0031	2.00
	1.0490	1.050	-0.0010	0.0029	2.00
	2.1900	2.183	0.0070	0.0080	2.00
440	0.0000	0.000	0.0000	0.0028	2.00
	0.5607	0.560	0.0007	0.0034	2.00
	1.0247	1.023	0.0017	0.0035	2.00
	2.1229	2.118	0.0049	0.0079	2.00
465	0.0000	0.000	0.0000	0.0028	2.00
	0.5236	0.521	0.0026	0.0030	2.00
	0.9634	0.963	0.0004	0.0029	2.00
	1.9763	1.974	0.0023	0.0070	2.00
546.1	0.0000	0.000	0.0000	0.0028	2.00
	0.5191	0.518	0.0011	0.0031	2.00
	1.0003	1.000	0.0003	0.0033	2.00
	1.9987	1.996	0.0027	0.0084	2.00
590	0.0000	0.000	0.0000	0.0028	2.00
	0.5523	0.552	0.0003	0.0030	2.00
	1.0809	1.082	-0.0011	0.0030	2.00
	2.0391	2.033	0.0061	0.0079	2.00
635	0.0000	0.000	0.0000	0.0028	2.00
	0.5601	0.562	-0.0019	0.0031	2.00
	1.0512	1.052	-0.0008	0.0030	2.00
	1.9294	1.925	0.0044	0.0079	2.00

## REPORT OF CALIBRATION

Certificate No. SP22-007

Page 4 of 5

Photometric Accuracy :

Wavelength (nm.)	CRMs Values (Abs)	UUC Reading (Abs)	Correction (Abs)	Uncertainty (Abs)	Coverage factor k
235	0.0000	0.000	0.0000	0.0050	2.00
	0.7478	0.746	0.0018	0.0057	2.00
257	0.0000	0.000	0.0000	0.0050	2.00
	0.8686	0.861	0.0076	0.0059	2.00
313	0.0000	0.000	0.0000	0.0050	2.00
	0.2912	0.291	0.0002	0.0051	2.00
350	0.0000	0.000	0.0000	0.0050	2.00
	0.6448	0.638	0.0068	0.0055	2.00

## REPORT OF CALIBRATION

Certificate No. SP22-007

Page 5 of 5

### Wavelength Accuracy :

CRM's Values (nm.)	UUC Reading (nm.)	Correction (nm.)	Uncertainty (nm.)	Coverage factor k
241.54	240.8	0.74	0.18	2.00
279.40	278.5	0.90	0.18	2.00
288.70	288.0	0.70	0.18	2.00
334.22	333.5	0.72	0.18	2.00
361.26	360.5	0.76	0.18	2.00
418.48	418.0	0.48	0.18	2.00
446.70	446.0	0.70	0.18	2.00
453.20	453.0	0.20	0.18	2.00
460.06	459.5	0.56	0.18	2.00
536.90	536.0	0.90	0.18	2.00
637.94	637.2	0.74	0.18	2.00
440.74	440.0	0.74	0.18	2.00
472.22	471.6	0.62	0.18	2.00
513.70	513.0	0.70	0.18	2.00
528.72	528.0	0.72	0.18	2.00
574.60	573.8	0.80	0.18	2.00
585.48	584.6	0.88	0.20	2.00
684.63	684.0	0.63	0.18	2.00
740.27	739.8	0.47	0.20	2.00
748.28	747.8	0.48	0.18	2.00
807.16	806.4	0.76	0.18	2.00
879.70	878.8	0.90	0.18	2.00

Remark : - UUC = Unit Under Calibration

- N/A = Not Available

- The result expanded uncertainty of measurement U is stated as the standard uncertainty of measurement multiplied by the coverage factor k.

which for a normal distribution corresponds to a coverage probability of approximately 95%

- \* Indicates from TISI accredited

- End of Certificate -

PM-709-02 R01 (2021)

**เอกสารไม่ควบคุม**



Request No. 25-65 / 0398

MTC. ACL.No. 486 / 65

## CALIBRATION CERTIFICATE

NOMENCLATURE : 1. Atomic Absorption Spectrophotometer "Agilent Technologies"

Model AA240FS, Serial No. MY13160001

2. Working standard solution "Inorganic Ventures"

Multi Analyte Custom Grade Solution, Lot No. P2-MEB675610

SUBMITTED BY United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk41, Sukhumvit Road, Bangchak, Prakanong, Bangkok 10260

CALIBRATION PROCEDURE : 1. Performance Verification of Atomic Absorption Spectrophotometer  
(WI-500-02-30)

2. Estimation Uncertainty of Measurement in Analytical Chemistry (QP-513)

REFERENCE MATERIAL : Traceable to NIST "Agilent Technologies", "Caro Erba"

Cadmium Lot No. 0108047046, Chromium Lot No. 0106315418, Copper Lot No. 0107480530, Iron Lot No. 0104697566,

Lead Lot No. 0104659473, Manganese Lot No. T109228A, Nickel Lot No. 0104978044, Zinc Lot No. 0100792297

CALIBRATION RANGE: 0.02,0.10,0.30,0.50,0.70 mg/l at 228.8 nm.Cd, 0.10,0.20,0.30,0.50,0.70 mg/l at 357.9 nm.Cr,

0.05,0.10,0.30,0.50,0.70 mg/l at 324.7 nm.Cu, 0.10,0.30,0.50,0.70,1.00 mg/l at 248.3 nm.Fe, 0.20,0.50,0.70,1.00,1.50 mg/l

at 217.0 nm.Pb, 0.05,0.10,0.30,0.50,0.70 mg/l at 279.5 nm.Mn, 0.10,0.30,0.50,0.70,1.00 mg/l at 232.0 nm.Ni,

0.05,0.10,0.30,0.50,0.70 mg/l at 213.9 nm.Zn

AMBIENT CONDITIONS : Temperature 22 °C Relative humidity 60 %

The Atomic Absorption Spectrophotometer set has been calibrated against Reference Material traceable to National Institute of Standards and Technology ( NIST ) by The Analytical Chemistry Laboratory. The results are attached herewith.

The results are only to be used for the purpose of calibration and are not to be used for any other purpose. The results are not to be used for any other purpose.

FM.BU.MTC.002 Rev.4

Office

The Analytical Chemistry Laboratory  
101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 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1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708



Request No. 25-65 / 0398

1 / 5

MTC. ACL. No. 486 / 65

## CALIBRATION DATA

## 1. Noise Level in term of standard deviation

Element	Cd	Cr	Cu	Fe	Pb	Mn	Ni	Zn
	-0.0004	0.0002	0.0007	0.0002	-0.0016	-0.0001	-0.0004	-0.0001
	0.0002	-0.0005	0.0010	0.0007	0.0000	-0.0003	0.0007	-0.0014
	-0.0002	0.0001	0.0008	0.0000	-0.0001	-0.0003	-0.0012	-0.0005
	0.0000	-0.0007	0.0007	0.0000	-0.0005	-0.0004	-0.0004	-0.0012
	0.0001	0.0004	0.0013	0.0014	-0.0001	-0.0001	0.0003	-0.0008
	0.0000	-0.0004	0.0003	-0.0012	-0.0005	-0.0007	-0.0004	-0.0008
	0.0000	-0.0009	0.0009	0.0002	-0.0010	-0.0008	0.0007	-0.0003
	-0.0004	-0.0003	0.0015	0.0010	-0.0005	-0.0003	-0.0002	-0.0004
	0.0004	0.0008	0.0014	-0.0004	-0.0014	-0.0005	-0.0006	-0.0003
	-0.0006	-0.0013	0.0012	-0.0006	-0.0006	-0.0006	-0.0007	-0.0007
	0.0005	-0.0003	0.0014	-0.0004	-0.0008	-0.0003	-0.0006	-0.0011
	-0.0007	-0.0014	0.0004	-0.0001	-0.0001	0.0000	0.0000	-0.0003
	0.0008	0.0004	0.0005	-0.0006	-0.0008	0.0000	-0.0005	-0.0009
	0.0011	0.0002	0.0005	0.0017	-0.0016	-0.0008	0.0004	-0.0005
	0.0002	0.0010	0.0014	-0.0002	-0.0010	-0.0010	0.0002	-0.0001
	0.0001	-0.0011	0.0011	-0.0003	-0.0011	-0.0003	-0.0008	-0.0012
	0.0000	-0.0015	0.0009	-0.0010	-0.0011	-0.0013	0.0000	-0.0004
	0.0015	-0.0012	0.0005	0.0002	-0.0017	-0.0001	0.0005	-0.0002
	0.0006	0.0014	0.0010	0.0002	-0.0003	0.0001	-0.0006	-0.0010
	0.0001	0.0003	0.0003	-0.0001	-0.0004	-0.0002	-0.0001	-0.0001
	0.0000	0.0000	0.0001	0.0000	-0.0001	0.0000	0.0000	-0.0001
	0.0005	0.0008	0.0004	0.0007	0.0005	0.0004	0.0005	0.0004

Continue 2 / 5

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Request No. 25-65 / 0398

2 / 5

MTC. ACL. No. 486 / 65

## 2. Precision

Element	Conc. (mg/l)	Absorbance										Ave. Abs.	SD	%RSD
Cd	0.02	0.0074	0.0062	0.0065	0.0070	0.0068	0.0070	0.0065	0.0065	0.0069	0.0067	0.0069	0.0004	5.76
	0.30	0.0952	0.0959	0.0951	0.0952	0.0950	0.0952	0.0948	0.0956	0.0943	0.0945	0.0945	0.0005	0.49
	0.70	0.2213	0.2180	0.2203	0.2208	0.2211	0.2196	0.2219	0.2201	0.2194	0.2211	0.2194	0.0015	0.67
Cr	0.10	0.0096	0.0098	0.0097	0.0102	0.0097	0.0098	0.0099	0.0103	0.0093	0.0100	0.0094	0.0004	3.82
	0.30	0.0309	0.0302	0.0300	0.0316	0.0306	0.0299	0.0309	0.0297	0.0311	0.0296	0.0300	0.0007	2.20
	0.70	0.0659	0.0667	0.0664	0.0648	0.0656	0.0642	0.0638	0.0638	0.0649	0.0646	0.0646	0.0011	1.70
Cu	0.05	0.0080	0.0075	0.0078	0.0075	0.0077	0.0081	0.0080	0.0075	0.0074	0.0076	0.0076	0.0003	3.26
	0.30	0.0417	0.0419	0.0412	0.0421	0.0424	0.0423	0.0403	0.0418	0.0415	0.0415	0.0415	0.0006	1.47
	0.70	0.0969	0.0965	0.0972	0.0957	0.0958	0.0961	0.0963	0.0959	0.0972	0.0966	0.0966	0.0006	0.58
Fe	0.10	0.0090	0.0105	0.0078	0.0099	0.0091	0.0093	0.0096	0.0094	0.0093	0.0094	0.0094	0.0007	8.11
	0.50	0.0462	0.0470	0.0464	0.0464	0.0467	0.0462	0.0467	0.0468	0.0466	0.0466	0.0466	0.0003	0.67
	1.00	0.0867	0.0886	0.0910	0.0892	0.0897	0.0873	0.0892	0.0885	0.0888	0.0874	0.0889	0.0013	1.43
Pb	0.20	0.0091	0.0095	0.0088	0.0087	0.0082	0.0094	0.0090	0.0087	0.0082	0.0090	0.0082	0.0007	2.09
	0.70	0.0322	0.0321	0.0324	0.0318	0.0335	0.0326	0.0327	0.0315	0.0336	0.0321	0.0321	0.0007	1.28
	1.50	0.0653	0.0645	0.0663	0.0664	0.0652	0.0671	0.0662	0.0666	0.0657	0.0668	0.0666	0.0008	1.28
Mn	0.05	0.0092	0.0092	0.0097	0.0087	0.0085	0.0079	0.0096	0.0085	0.0084	0.0099	0.0099	0.0007	7.32
	0.30	0.0616	0.0630	0.0632	0.0633	0.0634	0.0628	0.0640	0.0633	0.0640	0.0629	0.0633	0.0007	1.08
	0.70	0.1396	0.1366	0.1386	0.1377	0.1386	0.1386	0.1396	0.1380	0.1374	0.1383	0.1383	0.0009	0.67
Ni	0.10	0.0102	0.0092	0.0097	0.0104	0.0091	0.0105	0.0105	0.0096	0.0098	0.0102	0.0102	0.0005	5.22
	0.50	0.0488	0.0489	0.0499	0.0495	0.0484	0.0499	0.0481	0.0492	0.0495	0.0492	0.0492	0.0004	0.91
	1.00	0.0976	0.0979	0.0975	0.0992	0.0977	0.0973	0.0986	0.0962	0.0985	0.0982	0.0982	0.0008	0.85
Zn	0.05	0.0340	0.0349	0.0340	0.0352	0.0337	0.0351	0.0344	0.0345	0.0349	0.0343	0.0345	0.0005	1.49
	0.30	0.1669	0.1653	0.1628	0.1642	0.1657	0.1637	0.1659	0.1652	0.1654	0.1657	0.1657	0.0012	0.72
	0.70	0.3456	0.3467	0.3445	0.3430	0.3422	0.3404	0.3437	0.3433	0.3435	0.3438	0.3438	0.0013	0.37

Continue 3 / 5

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Request No. 25-65 / 0398

3 / 5

MTC. ACL. No. 486 / 65

3. Trueness

3.1 Reading on wavelength- Cadmium(Cd) at 228.8 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Cd	0.02804	0.019	-0.001	5.19	± 0.004
	0.30060	0.291	-0.010	3.19	± 0.006
	0.70140	0.618	-0.023	3.34	± 0.012

3.2 Reading on wavelength- Chromium (Cr) at 357.9 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Cr	0.1002	0.101	0.001	0.80	± 0.007
	0.3006	0.298	-0.003	0.86	± 0.012
	0.7014	0.635	-0.066	9.47	± 0.023

3.3 Reading on wavelength- Copper (Cu) at 324.7 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Cu	0.0502	0.046	-0.004	8.37	± 0.004
	0.3012	0.295	-0.006	2.06	± 0.010
	0.7028	0.694	-0.009	1.25	± 0.021

Continue 4 / 5

INDUSTRIAL METROLOGY AND TESTING SERVICE CENTRE



Advertising the Request Certificate and Results of the results are accepted as valid and are provided to the client within 10 days from the date of the results.

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3 / 5

MTC. ACL. No. 486 / 65

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4 / 5

MTC. ACL. No. 486 / 65

3.4 Reading on wavelength- Iron (Fe) at 248.3 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Fe	0.1003	0.106	0.006	5.68	± 0.008
	0.5015	0.522	0.021	4.09	± 0.017
	1.0030	0.993	-0.010	1.00	± 0.032

3.5 Reading on wavelength- Lead (Pb) at 217.0 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Pb	0.1988	0.197	-0.002	0.91	± 0.014
	0.6958	0.722	0.026	3.77	± 0.022
	1.0910	1.063	-0.028	1.88	± 0.041

3.6 Reading on wavelength- Manganese (Mn) at 279.5 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Mn	0.04955	0.050	0.004	8.98	± 0.004
	0.29730	0.317	0.0197	6.63	± 0.006
	0.69370	0.682	-0.0117	1.69	± 0.012

Continue 5 / 5

INDUSTRIAL METROLOGY AND TESTING SERVICE CENTRE



Advertising the Request Certificate and Results of the results are accepted as valid and are provided to the client within 10 days from the date of the results.

Head Office

35/41-3 Lumbini-Road, Phra Nakhon Si Ayutthaya District, Bangkok 13000, Thailand  
Tel: 06610 2577 9009  
Fax: 06610 2577 9009  
E-mail: mtc@mtc.or.th

Office/Laboratory

35/41-3 Lumbini-Road, Phra Nakhon Si Ayutthaya District, Bangkok 13000, Thailand  
Tel: 06610 2577 9009  
Fax: 06610 2577 9009  
E-mail: mtc@mtc.or.th

Office

35/41-3 Lumbini-Road, Phra Nakhon Si Ayutthaya District, Bangkok 13000, Thailand  
Tel: 06610 2577 9009  
Fax: 06610 2577 9009  
E-mail: mtc@mtc.or.th

Request No. 25-65 / 0398

4 / 5

MTC. ACL. No. 486 / 65

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Request No. 25-65 / 0398

5 / 5

MTC. ACL. No. 486 / 65

3.7 Reading on wavelength- Nickel (Ni) at 232.0 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Ni	0.099	0.102	0.003	3.03	$\pm 0.007$
	0.495	0.489	-0.006	1.21	$\pm 0.010$
	0.990	0.975	-0.015	1.52	$\pm 0.020$

3.8 Reading on wavelength- Zinc (Zn) at 213.9 nm.

Element	Standard Value of RM (mg/l)	Reading (mg/l)	Error of Measurement (mg/l)	Error of Measurement (%)	Uncertainty (mg/l)
Zn	0.050	0.050	0.000	0.00	$\pm 0.012$
	0.300	0.307	0.007	2.33	$\pm 0.011$
	0.700	0.660	-0.040	5.71	$\pm 0.015$

Remark : The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $2 (k = 2)$  which gives a level of confidence of approximately 95%

## INDUSTRIAL METROLOGY AND TESTING SERVICE CENTRE

### Head Office

35 Moo 3 Tambon Nong Luang, Amphoe Nong Luang,  
Changwat Pathumthani 12120, Thailand  
Tel. 060 0 2517 9200  
Fax. 060 0 2517 9209  
E-mail. [info@imtc.or.th](mailto:info@imtc.or.th)

### Office/Laboratory

Sri 10, Bangkapi Industrial Estate, Sukhumvit Road,  
Amphoe Bang Chuan, Samutprakan 10280, Thailand  
Tel. 060 0 2323 1672-80 ext. 115, 116  
Fax. 060 0 2323 9165  
E-mail. [imtc@imtc.or.th](mailto:imtc@imtc.or.th)

### Office

136 Phahonyothin Road, (Nonthaburi), Bangkok 10600,  
Thailand  
Tel. 02 511 2319  
Fax. 02 511 2319  
E-mail. [imtc@imtc.or.th](mailto:imtc@imtc.or.th)

FM/LMTC.002 Rev.4

The results relate only to the items investigated and are not valid for other items unless specifically stated otherwise. The results are not valid for other items unless specifically stated otherwise.



## Calibration Certificate

Certificate No.:

2201793-001-01

Client name:

UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Address:

3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchack, Phraekhong, Bangkok 10280

Page 1 of 5

Equipment:

pH Meter

Manufacturer:

METTLER TOLEDO

Model:

SevenEasy pH

Serial No.:

1231155210

ID No.:

UAE.WAT.010/2553

Order No.:

2201793

Operation No.:

2201793-001

Date of Receipt:

21 February 2022

Date of Calibration:

1 March 2022

Calibrated by

Mr. Phengphat Tuanjit  
Scientist

Date of Issue:

1 March 2022

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its suitability to recognize national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the National Fluid Institute.

F-CS-009 Revision: 00 Date: 14-12-61

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## Calibration Report

Certificate No.: 2201793-00141  
Equipment: pH Meter

Resolution: 0.01 pH 1 mV  
Manufacturer: METTLER TOLEDO  
Serial No.: 123155210  
ID No.: UAE.WAT.0102353

Date of Calibration: 1 March 2022

Location: Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE

Environment Condition: Ambient Temperature: ( 23.5 ± 1.5 ) °C Relative Humidity: ( 53 ± 5 ) %

Condition of Equipment: Good Condition

Condition of this Results of Calibration

1. Calibration Method: In house method, W-CO-002 based on direct measurement by using standard voltage calibrator and certified reference material (CRM)

2. Reference Standards / Certified Reference Material:  
Instruments  
2.1 DC Voltage Calibrator: Fluke, SCL-21F-6687, Due Date: 24 June 2022  
2.2 Digital Thermometer: Fluke, CC-6405599-01, 30 October 2022  
2.3 Thermo-Hygro Meter: NFI.B74HD415, QR23-0193, 27 January 2023

### Certified Reference Material

2.4 pH buffer 4.006 (Primary pH buffer Solution): CPACHEM, PH216L5, 19 April 2023  
2.5 pH buffer 6.865 (Primary pH buffer Solution): CPACHEM, PH217L5, 19 April 2023  
2.6 pH buffer 10.01 (Primary pH buffer Solution): CPACHEM, PH220L5, 19 April 2023  
2.7 pH buffer 7.00 (Standard pH buffer Solution): CPACHEM, PH107L5, 16 March 2022

3. This certification is traceable to The International System of Unit (SI Unit)

3.1 Instruments No.2.1 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0076

3.2 Instruments No.2.2 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0061

3.3 Instruments No.2.3 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0292

3.4 Certified Reference Material No. 2.4 to 2.6 traceable to: Primary measurement method, Normal cell using calibrated the monomer, barometer, and microcollimator The Standard Solution, preparation and certified by CPACHEM Ltd is seconded to ISO 17034 and ISO/IEC 17025

3.5 Certified Reference Material No. 2.7 traceable to: BNA Reagents Ltd 30.04.2020; BNA Reagents Ltd 28.05.2020; BNA Reagents Ltd 30.04.2020; BNA Reagents Ltd 28.05.2020. The Standard Solution is certified by CPACHEM Ltd is seconded to ISO 17034 and ISO/IEC 17025

4. This certificate was certified only for the instrument was calibrated.

5. The result of calibration was found accurate as shown on date and place of calibration only.



## Calibration Report

Certificate No.: 2201793-00141  
Equipment: pH Meter

Resolution: 0.01 pH 1 mV  
Manufacturer: METTLER TOLEDO  
Serial No.: 123155210  
ID No.: UAE.WAT.0102353

Date of Calibration: 1 March 2022

Location: Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE

Environment Condition: Ambient Temperature: ( 23.5 ± 1.5 ) °C Relative Humidity: ( 53 ± 5 ) %

Condition of Equipment: Good Condition

Condition of this Results of Calibration

1. Calibration Method: In house method, W-CO-002 based on direct measurement by using standard voltage calibrator and certified reference material (CRM)

2. Reference Standards / Certified Reference Material:  
Instruments  
2.1 DC Voltage Calibrator: Fluke, SCL-21F-6687, Due Date: 24 June 2022  
2.2 Digital Thermometer: Fluke, CC-6405599-01, 30 October 2022  
2.3 Thermo-Hygro Meter: NFI.B74HD415, QR23-0193, 27 January 2023

### Certified Reference Material

2.4 pH buffer 4.006 (Primary pH buffer Solution): CPACHEM, PH216L5, 19 April 2023  
2.5 pH buffer 6.865 (Primary pH buffer Solution): CPACHEM, PH217L5, 19 April 2023  
2.6 pH buffer 10.01 (Primary pH buffer Solution): CPACHEM, PH220L5, 19 April 2023  
2.7 pH buffer 7.00 (Standard pH buffer Solution): CPACHEM, PH107L5, 16 March 2022

3. This certification is traceable to The International System of Unit (SI Unit)

3.1 Instruments No.2.1 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0076

3.2 Instruments No.2.2 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0061

3.3 Instruments No.2.3 through: NSC-TIS-715 17025 Laboratory Accreditation of Calibration No.0292

3.4 Certified Reference Material No. 2.4 to 2.6 traceable to: Primary measurement method, Normal cell using calibrated the monomer, barometer, and microcollimator The Standard Solution, preparation and certified by CPACHEM Ltd is seconded to ISO 17034 and ISO/IEC 17025

3.5 Certified Reference Material No. 2.7 traceable to: BNA Reagents Ltd 30.04.2020; BNA Reagents Ltd 28.05.2020; BNA Reagents Ltd 30.04.2020; BNA Reagents Ltd 28.05.2020. The Standard Solution is certified by CPACHEM Ltd is seconded to ISO 17034 and ISO/IEC 17025

4. This certificate was certified only for the instrument was calibrated.

5. The result of calibration was found accurate as shown on date and place of calibration only.

## Calibration Report

**Certificate No.:** 2201793-001-01  
**Equipment:** Digital Thermometer with RTD (pH Meter)  
**Resolution:** 0.1 °C  
**Model:** SevenEasy pH  
**Serial No.:** 1231199210  
**ID No.:** UAEWAT0102553  
**Manufacturer:** METTLER TOLEDO  
**Date of Calibration:** 1 March 2022

Page 4 of 5

**Location:** Chemical Calibration Laboratory, NATIONAL FOOD INSTITUTE

**Environment Condition:**  
 Ambient Temperature 24 °C ± 1 °C  
 Relative Humidity 55 % ± 2 %

### Condition of this results of Calibration:

- Calibration Method :
  - In house method: W-TE-025 by comparison with standard thermometer
  - The Calibration is determined by comparing with a known temperature from a standard resistance thermometer.
  - The temperature scale in use at this laboratory is the International Temperature scale of 1990 (ITS-90)
- Reference Standard Instrument

Instrument	Model	Serial No.	Certificate No.	Due Date	Through
HANDHELD THERMOMETER	1523	2178154	PSL-T 089 /64	03-Jun-22	TISTR
Platinum Resistance Thermometer (PRT)	5027A	877332			

Support Equipment : - Low Temperature Bath (ISOCAL-6), Model: Europe-6 Plus Basic, S/N: 341592/2

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument was calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated Item : ☒ Good ☐ Without adjustment ☐ After adjustment
- Result of Calibration : ☒ X ☐ Without adjustment ☐ After adjustment

## Calibration Certificate

**Certificate No.:** 2202093-001-01  
**Client name:** UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
**Address:** 3 Soi Udomsuk 41, Sukhumvit Road,  
 Bangchack, Prakhonong, Bangkok 10260

Page 1 of 5

**Equipment:** pH Meter  
**Manufacturer:** METTLER TOLEDO  
**Model:** SevenEasy pH  
**Serial No.:** 1230525212  
**ID No.:** UAEWAS.00312553  
**Order No.:** 2202093  
**Operation No.:** 2202093-001  
**Date of Receipt:** 11 March 2022  
**Date of Calibration:** 10 March 2022

The uncertainty is for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement defined at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

# Calibration Report

<b>Certificate No.:</b>	2202093-001-01
<b>Equipment:</b>	<p>24 Meter</p> <p>Resolution: 0.01 pH      1 mV</p> <p>Manufacturer: METTLER TOLEDO</p> <p>Model: SevenEasy pH</p> <p>Serial No.: 1230523212</p> <p>Type: Bench top</p> <p>ID No.: UAE-WAS-0092553</p>
<b>Date of Calibration:</b>	16 March 2022

**Calibration Results:**  
1. Calibration of pH Meter (Manual Temperature Compensation at 25 °C)

Nominal pH	DC Voltage Standard (mV)	Average Indicator Reading		Uncertainty (mV)	Coverage Factor (t)
		mV	pH		
0	414.117	414	0.00	0.58	2.00
2	255.811	256	2.00	0.58	2.00
4	177.462	178	4.00	0.58	2.00
6	59.159	59	6.00	0.58	2.00
7	-0.001	0	7.00	0.58	2.00
8	-59.159	-59	8.00	0.58	2.00
10	-177.463	-177	10.00	0.58	2.00
12	-295.812	-295	12.00	0.58	2.00
14	-414.115	-414	14.00	0.58	2.00

### 2. Calibration of pH Meter with Electrode { Manual Temperature Compensation at 25 °C }

Serial No.: 9453943  
Performance of Electrode system  
Three-Point Calibration at pH 4, pH 7 and pH 10

4. This certificate was certified only for the instrument; we calibrated

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



## Calibration Report

Certificate No.: 2202093-001-01

Equipment: Digital Thermometer with RTD (pH Meter)

Resolution: 0.1 °C

Model: SevenEasy pH

Serial No.: 1230525212

ID No.: UAE WAS.0032593

Manufacturer: METTLER TOLEDO

Date of Calibration: 16 March 2022

Page 4 of 5

Location: Chemical Calibration Laboratory, National Food Institute.

Environment Condition: Ambient Temperature ( 23.0 ± 1.0 ) °C

Relative Humidity ( 50 ± 4 ) %

Condition of this results of Calibration:

1. Calibration Method :

- In house method: WTE-625 by comparison with standard thermometers.
- The Calibration is determined by correlating with a known temperature from a standard resistance thermometer.
- The temperature scale in use at this laboratory is the International Temperature scale of 1990 ( ITS-90 ).

2 Reference Standard Instrument .				
Instrument	Model	Serial No.	Certificate No.	
HANDHELD THERMOMETER	1523	2118154	PSL-T 045164	
Platinum Resistance Thermometer (PRT)	5827A	877332		
Support Equipment : - Low Temperature Bath (ISOCAL-B), Model: Europa-5 Plus Basic, S/N: 3415922				
			Due Date	Through
			24-Jun-22	T16TR

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

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

6. Condition of Calibrated Item : Good

7. Result of Calibration ☒ Without adjustment ☐ After adjustment

## Calibration Report

Certificate No.: 2202093-001-01

Equipment: Digital Thermometer with RTD (pH Meter)

Resolution: 0.1 °C

Model: SevenEasy pH

Serial No.: 1230525212

ID No.: UAE WAS.0032563

Manufacturer: METTLER TOLEDO

Date of Calibration: 16 March 2022

Page 5 of 5

Calibration point: 15.0, 25.0 and 35.0 °C

Calibration result: - The probe was immersed in liquid bath or dry bath to a minimum depth of 120 mm.

- Description of probe: model N/A S/N N/A

Dimension of probe : Diameter 3.5 mm., Length 135 mm.,

Sheath material : Stainless Steel

UUC* Reading (°C)	Standard Temperature (°C)	Correction Value (°C)	Uncertainty ± (°C)
10.2	15.004	-0.2	0.099
25.2	25.002	-0.2	0.099
35.2	35.002	-0.2	0.099

Note

- UUC\* : Unit Under Calibration

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k = 2, providing a level of confidence of 95%.



## Calibration Report

**Certificate No.:** 2201734-001-01  
**Equipment:** Digital Thermometer with RTD (pH Meter)  
**Resolution:** 0.1 °C  
**Model:** SevenEasy pH  
**Serial No.:** 1231155210  
**ID No.:** UAE.WAT.0102553  
**Manufacturer:** METTLER TOLEDO  
**Date of Calibration:** 1 March 2022

**Calibration point:** 15.0, 25.0 and 35.0 °C  
**Calibration result:**  
- The probe was immersed in liquid bath or dry bath to a minimum depth of 100 mm.  
- Description of probe, model: N/A SN: N/A  
Dimension of probe: Diameter 4 mm, Length 100 mm.  
Sheath material: Stainless Steel

UUC <sup>a</sup> Reading (°C)	Standard Temperature (°C)	Correction Value (°C)	Uncertainty ± (°C)
15.1	15.006	-0.1	0.050
25.1	25.004	-0.1	0.050
35.1	35.003	-0.1	0.050

**Note**  
- UUC<sup>a</sup> Unit Under Calibration  
The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence at approximately 95 %.

**End**

**เอกสารไม่ควบคุม**

F-CS-012 Revision: 00 Date: 14-12-61

## Accuracy Calibration Certificate

**Customer:**  
**Company:** United Analyst and Engineering Consultant Co., Ltd.  
**Address:** 3 Soi Udon Suk 41, Sukhumvit Rd., Bang Chak  
**City:** Phra Khairong  
**Zip / Postal:** 10260  
**State / Province:** Bangkok  
**Order Number:**  
**Contact:** Suwit Chotnok

**Weighing Device:**  
**Manufacturer:** Mettler Toledo  
**Model:** XSR205DU  
**Serial No.:** C21085394  
**Building:** N/A  
**Floor:** 2  
**Room:** Balance Room  
**Instrument Type:** Asset Number: UAE.WAO.0102565  
**Asset Number:** SRAT  
**Terminal Model:** C210855394  
**Terminal Serial No.:** N/A  
**Terminal Asset No.:** N/A

Range	Max. Capacity	Repeatability (g)
1	61 g	0.00001 g
2	220 g	0.0001 g

**Procedure**  
**Calibration Guideline:** EURAMET cp-18 v. 4.0 (1/2015)  
**METTLER TOLEDO Work Instruction:** CPM00270  
This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.  
The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.  
In accordance with EURAMET cp-18 (1/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Start: 22.4 °C	End: 22.4 °C	Start: 47.5 %	End: 46.2 %
Temperature	Humidity			

**As Found Calibration Date:** 05-May-2022  
**As Left Calibration Date:** N/A  
**Issue Date:** 09-May-2022  
**Approved Signature:**

Measurement Results

Repeatability

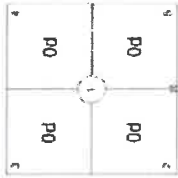
Test Load: 70 g			
Position	As Found	As Left	As Found
1	70.00005 g	N/A	
2	70.00006 g	N/A	
3	70.00004 g	N/A	
4	70.00005 g	N/A	
5	70.00007 g	N/A	
6	70.00007 g	N/A	
7	70.00005 g	N/A	
8	70.00006 g	N/A	
9	70.00006 g	N/A	
10	70.00006 g	N/A	
Standard Deviation	0.00003 g	N/A	

The "g" in the graph represents the readability of the range interval in which the test was performed.  
The results of the graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g			
Position	As Found	As Left	As Found
1	100.00000 g	N/A	
2	100.00000 g	N/A	
3	100.00000 g	N/A	
4	100.00000 g	N/A	
5	100.00000 g	N/A	
Maximum Deviation	0.00000 g	N/A	

The "g" in the graph represents the readability of the range interval in which the test was performed.



Error of Indication

As Found				
Position	Reference Value	Indication	Error of Indication	Expanded Uncertainty
1	0.00000 g	0.00000 g	0.00000 g	0.020 mg
2	0.05000 g	0.05001 g	0.00001 g	0.023 mg
3	0.10000 g	0.10001 g	0.00001 g	0.025 mg
4	1.00000 g	1.00001 g	0.00001 g	0.034 mg
5	5.00001 g	5.00001 g	0.00000 g	0.049 mg
6	20.00002 g	20.00002 g	0.00000 g	0.082 mg
7	50.00000 g	50.00002 g	0.00002 g	0.12 mg
8	80.00004 g	80.00009 g	0.00005 g	0.25 mg
9	100.00000 g	100.00000 g	0.00000 g	0.20 mg
10	150.00000 g	150.00000 g	0.00000 g	0.31 mg
11	200.00000 g	199.99999 g	-0.00001 g	0.38 mg

The calculated uncertainty was replaced by the CIMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CIMC value.

As Found

As Left



For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k = 2, which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.	WS54	Date of Issue	17-Nov-2020
Certificate Number	170240	Calibration Due Date	15-May-2022

Thermo Hygrometer

Equipment No.	IN161	Date of Issue	14-Jun-2021
Certificate Number	21H1220	Calibration Due Date	01-Jun-2022

Remarks

- FACT adjustment functionality activated
- Equipment condition: Good
- Calibration after installation
- Next calibration according to customer's procedure
- Calibration data not decide by calibration laboratory

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with  $k=2$  in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use:  $1.5 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use:  $3 K$

Uncertainty of Uncertainty Equation

Range		Max	As Found	As Left
1	0.00051 g	81 g	$U_1 = 0.021 \text{ mg} + 0.00450 \text{ mg/g} \cdot R$	N/A
2	0.0001 g	220 g	$U_2 = 0.05 \text{ mg} + 0.00448 \text{ mg/g} \cdot R$	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.00220 g	0.021 mg	0.95%
0.02200 g	0.021 mg	0.086%
0.22000 g	0.022 mg	0.0100%
2.20000 g	0.031 mg	0.0014%
220.0000 g	1.0 mg	0.00046%
		N/A
		N/A
		N/A
		N/A
		N/A
		N/A



The weighing range shown in the absolute uncertainty graph refers to the first interval/range of the device.

GWP®

Certificate



As  
Found



As  
Left



The weighing device meets the given  
process requirements.

The weighing device meets the given  
process requirements.

Tests Performed:



As Found



As Left

No adjustments/modifications made. As Left results  
correspond to As Found

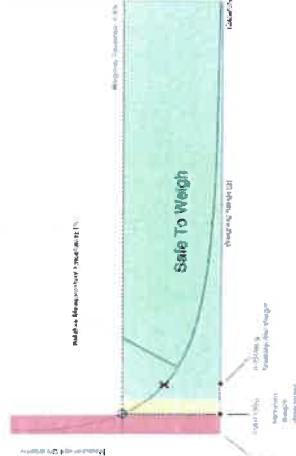
## Process Requirements

Weighing Tolerance: 0.5%

Smallest Net Weight: 0.05000 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. The graph reflects As Left findings, unless only As Found was performed.

## Minimum Weight As Found Minimum Weight Table

Range 1

Minimum weights for different weighing tolerances and safety factors					
Tolerance		Safety Factor			
		1	2	3	5
0.1%		0.020749 g	0.041687 g	0.062819 g	0.105659 g
0.2%		0.010351 g	0.020749 g	0.031195 g	0.052228 g
0.5%		0.004135 g	0.008277 g	0.012427 g	0.020749 g
1%		0.002067 g	0.004135 g	0.006205 g	0.010351 g
2%		0.001033 g	0.002067 g	0.003100 g	0.005170 g
5%		0.000413 g	0.000826 g	0.001240 g	0.002067 g

The minimum weight table applies to the fine range of the weighing device.



Pass: The determined minimum weight meets the requirement for the smallest net weight.

## As Left Minimum Weight Table

Range 1

Minimum weights for different weighing tolerances and safety factors					
Tolerance		Safety Factor			
		1	2	3	5
0.1%		0.020749 g	0.041687 g	0.062819 g	0.105659 g
0.2%		0.010351 g	0.020749 g	0.031195 g	0.052228 g
0.5%		0.004135 g	0.008277 g	0.012427 g	0.020749 g
1%		0.002067 g	0.004135 g	0.006205 g	0.010351 g
2%		0.001033 g	0.002067 g	0.003100 g	0.005170 g
5%		0.000413 g	0.000826 g	0.001240 g	0.002067 g

The minimum weight table applies to the fine range of the weighing device.



Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with  $k=2$  and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

### Notes on minimum weight values in above table:

- If "N/A" is shown above, no appropriate value could be calculated.
- METTLER TOLEDO is not responsible for the definition of the process requirements.



## Measurement Results

## Results Summary

	Repeatability	Eccentricity	Error of Indication
As Found:	✓	✓	✓
As Left:	✓	✓	✓

✓ = Passed

✗ = Failed

! = Safety Factor not met

## Repeatability

Test Load: 70 g

Tolerance	Control Limit	As Found	As Left
0.1%	0.000025 g	✓	✓
0.2%	0.000050 g	✓	✓
0.5%	0.000125 g	✓	✓
1%	0.000250 g	0.000009 g	0.000009 g
2%	0.000500 g	✓	✓
5%	0.001250 g	✓	✓

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

## Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found	As Left
0.1%	0.0500 g	✓	✓
0.2%	0.1000 g	✓	✓
0.5%	0.2500 g	0.0000 g	0.0000 g
1%	0.5000 g	✓	✓
2%	1.0000 g	✓	✓
5%	2.5000 g	✓	✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

## Error of Indication

As Found

Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	N/A
20.00002 g	0.00000 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
50.00000 g	0.00002 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
80.00004 g	0.00005 g	0.04000 g	0.08000 g	0.20000 g	0.40000 g	0.80000 g	2.00000 g
100.00000 g	0.0000 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
190.00000 g	0.0000 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
200.00000 g	-0.00001 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

As Left

Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.00000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	N/A
20.00002 g	0.00000 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
50.00000 g	0.00002 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
80.00004 g	0.00005 g	0.04000 g	0.08000 g	0.20000 g	0.40000 g	0.80000 g	2.00000 g
100.00000 g	0.00000 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
150.00000 g	0.00000 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
200.00000 g	-0.00001 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
5344 PATTANAKARN ROAD/501/16, SI ANULANG, SUANLUANG BANGKOK 10549  
TEL. 02-2712-3000-27 FAX. 02-27104984



REGISTRATION NO. 1000  
CALIBRATION 8008

Cert. No.: 21TM1876  
Page.: 1 of 3

## Certificate of Calibration

**Equipment :** Hot Air Oven  
**Manufacturer :** Memmert  
**Model :** UF 55  
**Serial No. :** B216.1666  
**ID No. :** UAE.WAO.027/2559

**Submitted by :** United Analyst and Engineering Consultant Co., Ltd.  
3501 Udomsuk 41, Sukhumvit Road,  
Bangchak, Phraekhanong,  
Bangkok 10260  
**Location :** Lab Floor 2

**Received Order :** 29 October 2021  
**Calibration Date :** 29 October 2021  
**Ambient Temperature :** ( 26 ± 10 ) °C  
**Relative Humidity :** ( 50 ± 30 ) %

**Calibrated by :** Kunchit Promprat

**Approved by :**  
( ) Pornthippa Tameyakul  
( ) Malee Bulkruea  
( ) Suwit Injai

**Issue Date :** 4 November 2021

The Uncertainties are for a confidence probability of approximately 95%

This certificate may only be reproduced in whole or in part without the prior written  
Approval of the Institute of Calibration and Testing Services

เอกสารประกอบ



**Equipment :** Hot Air Oven  
**Condition As-Received :** Used Item  
**Reference :** 2110-07010C-1

**Procedure Used :-**

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

**Condition of this result of calibration**

1. Reference standard instrument:-

**Instrument** **Model** **Serial No.** **Cert. No.** **Due Date**  
1) Data Acquisition 34970A MY44067817 21LM10 20 Jul 2022

2. This certificate is valid only to the item calibrated on date and place of calibration.

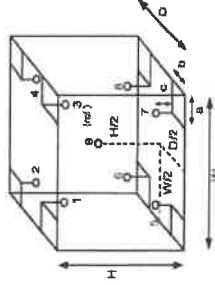
3. This certificate is traceable to the International System of Unit.

**Result of Calibration :-** ( \* ) Without Adjustment

**Function of UUC\* :** Temperature Source

**Fresh air setting :** Close

Environment during calibration	
Temp. ( °C )	Beginning Finished
REL.Humid. ( % )	28 28
AC Supply ( Volt )	56 55
	230 230



Ref. Std. ID No.: @ Calibration Point	
Position : ( 140, 180 ) °C ( 104 ) °C	
1	21-15TC-01 15RTD2/11
2	21-15TC-02 15RTD2/12
3	21-15TC-03 15RTD2/13
4	21-15TC-04 15RTD2/14
5	21-15TC-05 15RTD2/15
6	21-15TC-06 15RTD2/20
7	21-15TC-07 15RTD2/17
8	21-15TC-08 15RTD2/18
9 (ref.)	21-15TC-09 15RTD2/19

**Probe Installation Details :**

**Dimension of Chamber :**  
a = 5.0 cm D = 0.33 m  
b = 5.0 cm W = 0.40 m  
c = 5.0 cm H = 0.40 m  
Capacity = 0.053 m<sup>3</sup>

ตาม

เอกสารประกอบ



**Equipment :** Hot Air Oven  
**Condition As-Received :** Used Item  
**Reference :** 2110-0701OC-1  
**Result of Calibration :-** (\*) Without Adjustment  
**Function of UUC\* :** Temperature Source  
**Fresh air setting :** Close

**Cert. No.:** 211TM1876  
**Page.:** 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
104.0	104.0	104.0	0.11	0.52	0.72	0.42	2
140.0	140.0	140.0	0.25	1.1	1.4	1.1	2
180.0	180.0	180.0	0.18	0.87	1.2	1.1	2

Calibration Point (°C)	Measured Temperature (°C)								
	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
104.0	103.852	103.978	104.382	104.323	103.776	104.015	104.312	104.196	103.907
140.0	140.309	140.730	140.426	140.270	139.531	139.666	140.067	139.895	139.750
180.0	180.598	180.339	180.755	180.619	179.716	179.829	180.204	180.365	179.975

**Average\* :** The average of 30 values in each position.  
**Temperature stability :** One-half of the greatest maximum difference of measured temperature at any one sensor.  
**Temperature uniformity :** The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.  
**Overall Variation :** The Difference of the maximum and minimum measured temperatures throughout observation.  
**UUC\* :** Unit Under Calibration

**Note :** The reported uncertainty of measurement was included stability and excluded uniformity .  
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
933-3 PATHANAKARN ROAD SUB W. SUANLUANG, SI ANULANG BANGKOK 10250  
TEL : 0-2715-3000-27 FAX : 0-2719-9484



**Cert. No.:** 22TM80  
**Page.:** 1 of 3

## Certificate of Calibration

**Equipment :** BOD Incubator  
**Manufacturer :** Arco  
**Model :** UC4-1320  
**Serial No. :** 13URC4S013201  
**ID No. :** UAE.WAO.015/2561

**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Sol Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhetong,  
Bangkok 10260  
**Location :** Lab Floor 2

**Received Order :** 17 February 2022  
**Calibration Date :** 17 February 2022  
**Ambient Temperature :** ( 26 ± 10 ) °C  
**Relative Humidity :** ( 50 ± 30 ) %

**Calibrated by :** Kunchit Promprat

**Approved by :**

{ } Pornthippa Tameyakul  
{ } Malee Butkruea  
{ } Suwit Imjai

**Issue Date :** 22 February 2022

The Uncertainties are for a confidence probability of approximately 95%

This certificate can be applied for calibration only in accordance with the scope of the  
approval on the body of the certificate. It is not valid for any other purpose.

เอกสารไม่ควบคุม



เอกสารไม่ควบคุม  
A 0038099



**Equipment :** BOD Incubator  
**Condition As-Received :** Used Item  
**Reference :** 2202-0446OC-1  
**Procedure Used :-**

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector ( RTD ).

The temperature scale used was based on ITS-90.

**Condition of this result of calibration**

1. Reference standard Instrument:-

**Instrument** **Model** **Serial No.** **Cert. No.** **Due Date**  
1 ) Data Acquisition 34970A MY44035217 21LM30 23 Dec 2022

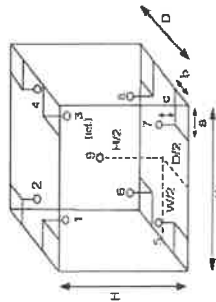
2. This certificate is valid only to the item calibrated on date and place of calibration.

3. This certification is traceable to the International System of Unit.

**Result of Calibration :-** ( ° ) Without Adjustment

**Function of UUC\* :** Temperature Source

**Fresh air setting :** Not Available



**Probe Installation Details :**

a = 10 cm  
b = 10 cm  
c = 10 cm  
Dimension of Chamber :  
D = 0.62 m  
W = 1.2 m  
H = 1.2 m  
Capacity = 0.89 m<sup>3</sup>

Position :	Ref. Std. ID No.:
1	18-10RTD-01
2	18-10RTD-02
3	18-10RTD-03
4	18-10RTD-04
5	18-10RTD-05
6	22-10RTD-10
7	18-10RTD-07
8	18-10RTD-08
9 (ref.)	18-10RTD-09

Environment during calibration		
	Beginning	Finished
Temp. ( °C )	28	28
REL.Humid. ( % )	68	75
AC Supply ( Volt )	226	226



**Equipment :** BOD Incubator  
**Condition As-Received :** Used Item  
**Reference :** 2202-0446OC-1  
**Result of Calibration :-** ( ° ) Without Adjustment  
**Function of UUC\* :** Temperature Source  
**Fresh air setting :** Not Available

Calibration Point ( °C )	UUC* Setting ( °C )	UUC* Reading ( °C )	Temperature stability ( ± °C )	Temperature uniformity ( °C )	Overall Variation ( °C )	Uncertainty ( ± °C )	Coverage Factor <i>k</i>		
20.0	19.5	19.4	0.30	0.58	1.0	0.55	2		
Measured Temperature ( °C )									
Calibration Point ( °C )	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
20.0	20.154	20.013	20.356	19.939	19.834	19.761	19.817	19.824	19.922

**Average\* :** The average of 30 values in each position.

**Temperature stability :** One-half of the greatest maximum difference of measured temperature at any one sensor.

**Temperature uniformity :** The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

**Overall Variation :** The Difference of the maximum and minimum measured temperatures throughout observation.

**UUC\* :** Unit Under Calibration

**Note :** The reported uncertainty of measurement was included stability and excluded uniformity

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

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เอกสารไม่ควบคุม  
a 1096041

## Calibration Certificate

**Certificate No.:** 2203120-001-01  
**Client name:** UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
**Address:** 3 Soi Udomsuk 41, Sukhumvit Road,  
 Bangchack, Prakhong, Bangkok 10260

Page 1 of 3

**Equipment:** Electronic Balance  
**Manufacturer:** METTLER TOLEDO  
**Model:** AB204-S/FACT  
**Serial No.:** 1129361010  
**ID No.:** UAE.WAS.002/2552  
**Order No.:** 2203120  
**Operation No.:** 2203120-001  
**Date of Receipt:** 1 June 2022  
**Date of Calibration:** 1 June 2022

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

FCS-009 Revision: 01 Date: 20-04-65

## Calibration Report

**Certificate No.:** 2203120-001-01  
**Equipment:** Electronic Balance  
**Model:** AB204-S/FACT  
**Serial No.:** 1129361010  
**Capacity:** 220 g  
**Manufacturer:** METTLER TOLEDO  
**Resolution:** 0.0001 g  
**ID No.:** UAE.WAS.002/2552

Page 2 of 3

**Date of Calibration:** 1 June 2022  
**Environment Condition:** Ambient Temperature: 19.9 ± 0.3 °C Relative Humidity: 45 ± 1.5 %  
**Place of Calibration:** 108, Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
**Condition of Equipment:** Good Condition

### Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-MA-001 In-House Method based on UKAS Lab 14 : 2019

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1-500mg	B306068554	TCS	M22010205	6 January 2023
Standard Weight Class E2	1-500g	B306068128	TCS	M22010215	6 January 2023
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	PONPE 400	NFLETH 010/18	Quality Room	QR22-0350	18 February 2023

3. This certificate is traceable to SI UNIT

4. This certificate is certified only for the instrument we calibrated.

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

### Calibration Results:

#### 1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
100	0.00048
200	0.00052

#### 2. Off-Center Error:

A mass of 50 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

Position	1	2	3	4	5	6	(Maximum Difference)
Reading (g)	49.9999	49.9998	49.9998	49.9999	49.9998	49.9998	0.0001

FCS-012 Revision: 01 Date: 20-04-65



