

ภาคผนวก ข

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## เอกสารสอบเทียบเครื่องมือที่ใช้ในการวิเคราะห์



## CERTIFICATE OF CALIBRATION

Certificate No.: C0-1608001/24 Page 1 of total 4 pages

**Customer** WATER ANALYSIS CENTER CO., LTD.  
1/94 Moo 5, T.Kanham,  
A.U-thai, Ayutthaya 13210

**Equipment** pH Meter  
**Manufacturer** METTLER TOLEDO **Model** SevenCompact S220  
**Serial No.** B327527211 **ID No.** WWL 0068  
**Description** Range : 0 - 14 pH, Resolution : 0.01 pH

**Environmental Conditions** Ambient Temperature: (20 ± 2) °C  
Relative Humidity: (50 ± 10) %  
Atmospheric Pressure: -

**Calibration Location** Jayhawk Laboratory (CL&GL)

**Received Date** 16 August 2024

**Calibration Date** 16 August 2024

**Date of Issue** 19 August 2024

**Condition of Artifacts** Used conditions but can be calibrated

Checked by Act as Technical Manager

Approved by Representative of Managing Director

( ) (Krizoyal K.) ( ) (Sakda Y.)  
( ) (Paliphan K.) ( ) (Onnape P.)  
( ) (Pongsak H.) ( ) (Nithiphong K.)  
( ) (Kanung C.) ( ) (Nonthachai K.)  
( ) (Pramong P.) ( ) (Noppol P.)

(Dr. Ekachai Puttinwong)

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FE-169

REV.02 02/24/21

Certificate No.: C0-1608001/24

Page 3 of total 4 pages

### Measurement Results (Cont.):

#### 2. Calibration of pH Electrode (Serial No.: 3222623)

pH Standard Solution (pH)	Measured Value		Uncertainty (± pH)
	(pH)	(mV)	
4.01	4.01	186.1	0.013
7.01	7.01	9.3	0.013
10.01	10.00	-164.5	0.013

Note : Adjust Curve to Buffer Solution pH (4,7,10)

Temperature stability of micro bath : 25 ± 0.2 °C

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

Calibrated by Athipat  
REV.02 02/24/21

FE-169

ภาคผนวก ข-1

Certificate No.: C0-1608001/24

Page 2 of total 4 pages

### Reference Method:

- The calibration method used was CP-178 based on an in-house method.

- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

### Reference Standard:

Type	pH Value	Lot No.	Due Date	Traceability
pH Standard Solution	4.01	150823	Feb. 9, 2025	NIMT
	7.01	180723	Jan. 12, 2025	
	10.01	160823	Jan. 16, 2025	

Type	Serial No.	Certificate No.	Due Date	Traceability
Documenting Process Calibrator	2630521	10-2312001/23	Dec. 24, 2024	THC
Digital Thermometer with Sensor	1709138 / 4605984-005	10-0806001/24	Jun. 7, 2025	

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- NIMT, National Institute of Metrology (Thailand).

- THC, Thai Heart Calibration Co., Ltd.

### Measurement Results:

#### 1. Function Simulated pH Meter

Standard Applied (mV)	Nominal Value (pH)	UUC Reading		Uncertainty (± mV)
		pH	mV	
177.48	4.00	4.01	177.3	0.060
0.00	7.00	7.00	-0.1	0.060
-177.48	10.00	10.01	-177.4	0.060

UUC : Unit Under Calibration

Note : Adjust Curve to simulate pH (4,7,10)

Calibrated by Athipat

REV.02 02/24/21

FE-169

Certificate No.: C0-1608001/24

Page 4 of total 4 pages

### Reference Method:

- The calibration method used was CP-096 based on an in-house method.

- The temperature scale used was an ITS-90.

- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

### Reference Standard Instruments:

Type	Serial No.	Cert. No.	Due Date	Traceability
Thermometer Readout	B7C853	10-0911001/23	Nov. 8, 2024	THC
Platinum Resistance Thermometer	4854	C0A30047	Oct. 22, 2025	FLUKE
Liquid Bath	XO111019	10-2405001/23	May 25, 2025	THC

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- THC, Thai Heart Calibration Co., Ltd.

- FLUKE, Fluke Corporation, U.S.A.

### Measurement Results:

(X) Without Adjustment

Dimension of probe : Diameter 4 mm, Sensor Type : RTD (PT100)

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
120	22.00	22.2	-0.20	0.065
120	25.00	25.2	-0.20	0.065
120	28.00	28.2	-0.20	0.065

UUC : Unit Under Calibration

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -

Calibrated by Pongsak

REV.02 02/24/21

FE-169

## CERTIFICATE OF CALIBRATION

Certificate No.: C0-1607004/24 Page 1 of total 2 pages

**Customer** WATER ANALYSIS CENTER CO., LTD.  
1/94 Moo 5, T.Kanham,  
A.U-thai, Ayutthaya 13210

**Equipment** Conductivity Meter  
**Manufacturer** EUTECH **Model** CON 2700  
**Serial No.** 2657889 **ID No.** WW1.0136  
**Description** -

**Environmental Conditions** Ambient Temperature: (20 ± 2) °C  
Relative Humidity: (50 ± 10) %  
Atmospheric Pressure: -

**Calibration Location** Jayhawk Laboratory (CL&GL)

**Received Date** 16 July 2024

**Calibration Date** 18 July 2024

**Date of Issue** 18 July 2024

**Condition of Artifacts** Used conditions but can be calibrated

Checked by: Approved by:   
Act as Technical Manager Representative of Managing Director

( ) ( Krisyos K. ) ( ) ( Sakda Y. )  
( ) ( Patiphan K. ) (✓) ( Onnapa P. )  
( ) ( Pongsak H. ) ( ) ( Nitiphong K. )  
( ) ( Kamong C. ) ( ) ( Nonthachai K. )  
( ) ( Pramong P. ) ( ) ( Noppol P. )

( Dr. Ekachai Puntitwong )

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PE-169 REV.02 02/24/21

## Certificate of Calibration

TEMPERATURE  
CONTROLLER ENCLOSURES



Page 1 of 3

Certificate No.: MC 2407449

**Customer** Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kanham, A.U-Thai, Ayutthaya 13210.

**Reference Job No.** : 24-1546 **Received Date** : 9 July 2024  
**Description** : Refrigerator **Resolution** : 0.1 °C  
**Manufacturer** : SANDEN INTERCOOL **Model** : SEC-1500SHD  
**Serial No.** : SEC1500201A-0708-00304 **ID No.** : WW1.0038  
**Marking** : Additionally for the purpose of identification by this laboratory a label marked with this certificate number ( MC 2407449 ) has been attached to the case.  
**Method** : In-house calibration procedure MWI-T-033 this method Base on TLAS G-20-1/02-08 "Temperature Controlled Enclosures".  
**Location of Calibration** : Water Analysis Center Co., Ltd.; Laboratory.  
**Environmental Conditions** : Ambient Temperature : ( 25.2 to 25.4 ) °C  
Relative Humidity : ( 62.1 to 63.3 ) %  
**Date of Calibration** : 9 July 2024 **Date of Issue** : 10 July 2024

Checked by:   
Chalermkit Rakphada  
( Calibration Engineer )

Approved by:   
Aittipong Karjaneash  
( Technical Manager )

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co., Ltd.

Certificate No.: C0-1607004/24

Page 2 of total 2 pages

### Reference Method:

- The calibration method used was CP-177 based on an in-house method.  
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

### Reference Standard :

Material	Batch Value	Lot Number	Due Date	Traceability
Conductivity Standard Solution	147.1 µS/cm 1.423 mS/cm	S230330005 S231129006	Nov. 9, 2024 May 13, 2025	SCP Science SCP Science

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:  
- SCP Science.

### Measurement Results: (Probe Serial No. : 93X219065)

Conductivity Standard Solution	Measured Value	Correction	Uncertainty ( ± )
147.1 µS/cm	149.0 µS/cm	-1.9 µS/cm	2.5 µS/cm
1.423 mS/cm	1.425 mS/cm	-0.002 mS/cm	0.0052 mS/cm

Note : Adjustment points: 147.1µS/cm 1.423mS/cm

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -

Calibrated by: Athipai  
REV.02 02/24/21

Certificate No.: MC 2407449

Page 2 of 3

### Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2309074	MY44012056	7 Aug 2024	MCAL

With Thermocouple Type " T " ID. No. 14/1 to 14/9

### Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

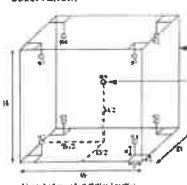
### 1. Calibration Procedure:

This instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

**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 patterns or homogeneity within the chamber under steady state conditions. The reference sensor should preferably be located at the geometric center of the chamber.

**Temperature Stability** - one-half of the greatest maximum difference of measured temperatures at any one sensor.

**Overall Variation** - The Difference of the maximum and minimum measured temperatures throughout observation.



Overall Ambient Temperature around the Chamber variation : 4.2 °C

Overall Line Voltage variation : 0.1 V

Chamber Size (W\*H\*D) : 171 cm x 157 cm x 60 cm

Checked by:



Certificate No. : MT24-3208

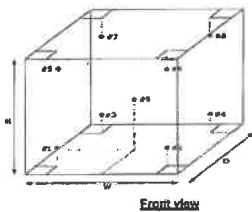
Page : 2 of 2

Function : Temperature measurement  
Calibration point : 104, 180 °C

Result : Without adjustment  
Resolution : 0.1 °C

Calibration point (°C)	Temperature of UUC* at each position (°C)									Uncertainty of measurement (± °C)
104	103.494	103.933	103.871	103.988	103.990	104.081	103.843	104.217	104.022	0.45
180	179.885	179.853	180.047	179.985	179.808	180.088	180.095	180.273	180.105	0.54

Setting temperature (°C)	Indicating Temperature (°C)	Measured stability (± °C)	Measured uniformity (°C)	Overall variation (°C)
104.0	104.0	0.34	0.66	1.3
180.0	180.0	0.41	0.86	1.2



- #1 Lower Left Front
- #2 Lower Right Front
- #3 Lower Left Rear
- #4 Lower Right Rear
- #5 Upper Left Front
- #6 Upper Right Front
- #7 Upper Left Rear
- #8 Upper Right Rear
- #9 Geometric Center

Front view

UUC\* = Unit under calibration

Uniformity = Maximum and Minimum difference of measured temperature at any probes and the measured temperature at the reference and same time.

Overall Variation = Difference of temperature value between the maximum and minimum any time.

Stability = One half of the maximum difference of measured temperatures at any one probe.

Rev.03 / Feb 2024

-00-

FM-MT-013



## Certificate of Calibration

Equipment: Balance  
Model: BL 210S  
Serial No. (or ID.): 15808131 (WWL 0022)  
Manufacturer: Sartorius  
Condition: In condition

Certificate No.: C01241754  
Issued Date: 05 June 2024  
Job No.: WO-00030302  
Page: 1 of 2

Customer: Water Analysis Center Co., Ltd.  
1/94 Moo 5, Rojana Industrial Park, Rojana Road,  
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

Environment Condition: Temperature 26 °C ± 0.2 °C  
Humidity 50 %RH ± 2.6 %RH

Calibration Place: Water Analysis Center Co., Ltd. ( หอเครื่องชั่ง )  
1/94 Moo 5, Rojana Industrial Park, Rojana Road,  
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

Calibration By: Mr. Polawad Ruamrui

Calibration Date: 05 June 2024

The Method used: In-house method, CAL-WI-47, based on UKAS Lab 14

Traceability: This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02240400

*Mr. Polawad Ruamrui*

(Mr. Polawad Ruamrui)  
Person in charge

*Mr. Rungrod Jenkitrakulchai*

(Mr. Rungrod Jenkitrakulchai)  
Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.  
The measurement uncertainty stated in the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).  
These results may be affected by departure from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

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2533 Prachathipitai Road, Bangkokthampon, Prachinburi 31000  
Phone: +66 3638 7000 Email: info@dksh.com Website: www.dksh.com

Delivering Growth - In Asia and Beyond.

CAL-FRM-C01-14; 12 Sep 2022



Certificate No.: C01241754

Page: 2 of 2

### Calibration Results:

Without Adjustment

Eccentric Error: Weight to be 1/3 or 1/2 of Maximum capacity, taken from the corner of the pan as a zero reference.

Nominal Test Value	100 (g)				
	Reference Points (g)				
	A	B	C	D	E
	-	0.0000	0.0001	0.0000	-0.0002

Repeatability: Determination of the standard deviation of weighing balance, Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
20	0.00004
200	0.00008

Error of indication from nominal or conventional mass value, Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
1	1.00001	1.0000	0.0000	0.00011	2.04
2	2.00002	2.0000	0.0000	0.00011	2.04
5	5.00002	5.0000	0.0000	0.00011	2.04
10	10.00001	10.0000	0.0000	0.00011	2.04
20	20.00001	20.0000	0.0000	0.00012	2.03
50	50.00003	50.0000	0.0000	0.00013	2.02
70	70.00004	70.0000	0.0000	0.00013	2.01
100	89.99998	100.0001	0.0001	0.00017	2.01
120	119.99997	120.0002	0.0002	0.00021	2.00
150	149.99999	150.0002	0.0002	0.00024	2.00
200	199.99996	200.0004	0.0004	0.00030	2.00

The End of Certificate



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80-82 ถนนประชาชื่นปิ่นทอง แขวงบางขุนพรหม เขตพระนคร กรุงเทพฯ 10200  
80-82 Prachathipitai Rd., Bangkokthampon, Prachinburi, Bangkok 10200  
Tel. 0-2629-0191-6, 0-2280-1787, Fax. 0-2280-1785, E-mail: ths@thaiunique.com, Website: www.thaiunique.com

### PREVENTATIVE MAINTENANCE (PM) CHECK LIST

FOR ATOMIC ABSORPTION SPECTROMETER

Model & Serial Number: 240FS AA & M418250004

Customer: Water analysis center Co., Ltd.

Date: 25 Apr 2024

Safety

- ☒ Flame, Inspect/replace o-ring nebulizer, spray chamber and burner
- ☒ Flame, Clean nebulizer, spray chamber and burner
- ☒ Flame, Check liquid trap interlock, burner interlock, pressure relief bung interlock and shield interlock
- ☐ Furnace, Clean work head, electrode and shroud N/A
- ☐ Furnace, Clean PSD and PSD tray N/A
- ☐ Furnace, Check water pressure N/A
- ☒ Check drain tube
- ☒ Check exhaust system
- ☒ Check gas pressure sensor interlock
- ☒ Check and all gas hoses for Spectra AA
- ☒ Clean computer control

Optics

- ☒ Inspect/Replace that external optics surfaces
- ☒ Check Wavelength Accuracy the copper line at 323.0-326.0 nm = 324.7 nm
- ☒ Check that PMT % Gain the copper at 324.8 nm, 4 mA, 0.5 nm slit width, Gain = 2.9% (should be ≤ 64% or ≤ 380V)
- ☒ Flame, Check I2 lamp is work



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80-82 Prachathipatani Rd., Bangkokphrom, Pranakorn, Bangkok 10200  
Tel: 0-2629-0191-6, 0-2280-1787, Fax: 0-2280-1788, E-mail: thauw@thaiunique.com, Website: www.thaiunique.com

Electronics

- ☒ Check power supply voltage
- ☒ Check cables and connectors
- ☒ Check/Clean all boards in the instrument
- ☐ Furnace, Check camera and align\*\* N/A

\*\*Option for Graphite Zeeman only

Mechanisms

- ☒ Flame, Check the burner adjuster
- ☐ Furnace, Check PSD accessories N/A

Analytical performance

- ☒ Clear the sample compartment
- ☒ Flame, Check uptake rate from 7.2-10.6 mL per minute = 8.5 mL/min
- ☒ Test Photometric noise, STDV = 0.0001 Abs (should be  $\leq 0.00050$  Abs)
- ☒ Flame, Test high solids nebulizer setting use  
-Al/acet Cu 5 ppm = 0.79 Abs, and Precision  
(%RSD) = 0.4 % (should be  $> 0.55$  Abs and  $< 0.5\%$  RSD)  
or  
-N2O/acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision  
(%RSD) = \_\_\_\_\_ % (should be  $> 0.3$  Abs and  $< 0.5\%$  RSD)
- ☐ Furnace, Characteristic mass and sensitivity Cu 25 ppb = \_\_\_\_\_ Abs, and Precision (%RSD) = \_\_\_\_\_ % (should be  $\geq 0.15$  Abs and  $\leq 4.0\%$  RSD)

SIGN:

Engineer: Suniga Mecharoen

Customer: Water Analysis Center Co., Ltd.

2/2



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80-82 ถนนประชาชื่นไทย แขวงบางขุนพรหม เขตพระนคร กรุงเทพฯ 10200  
80-82 Prachathipatani Rd., Bangkokphrom, Pranakorn, Bangkok 10200  
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PREVENTATIVE MAINTENANCE (PM) CHECK LIST

FOR ATOMIC ABSORPTION SPECTROMETER

Model & Serial Number: 2402 AA & MY18230004

Customer: Water Analysis Center Co., Ltd.

Date: 26 Apr 2024

Safety

- ☐ Flame, Inspect/replace o-ring nebulizer, spray chamber and burner N/A
- ☐ Flame, Clean nebulizer, spray chamber and burner N/A
- ☐ Flame, Check liquid trap interlock, burner interlock, pressure relief bung interlock and shield interlock N/A
- ☒ Furnace, Clean work head, electrode and shroud
- ☒ Furnace, Clean PSD and PSD tray
- ☒ Furnace, Check water pressure
- ☒ Check drain tube
- ☒ Check exhaust system
- ☒ Check gas pressure sensor interlock
- ☒ Check and all gas hoses for SpectraAA
- ☒ Clean computer control

Optics

- ☒ Inspect/Replace that external optics surfaces
- ☒ Check Wavelength Accuracy the copper line at 323.0-326.0 nm = 324.7 nm
- ☒ Check that PMT % Gain the copper at 324.8 nm, 4 mA, 0.5 nm slit width, Gain = 90% (should be  $\leq 64\%$  or  $\leq 380V$ )
- ☐ Flame, Check D2 lamp is work N/A

1/2



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Tel: 0-2629-0191-6, 0-2280-1787, Fax: 0-2280-1788, E-mail: thauw@thaiunique.com, Website: www.thaiunique.com

Electronics

- ☒ Check power supply voltage
- ☒ Check cables and connectors
- ☒ Check/Clean all boards in the instrument
- ☒ Furnace, Check camera and align\*\*

\*\*Option for Graphite Zeeman only

Mechanisms

- ☐ Flame, Check the burner adjuster N/A
- ☒ Furnace, Check PSD accessories

Analytical performance

- ☒ Clear the sample compartment
- ☐ Flame, Check uptake rate from 7.2-10.6 mL per minute = \_\_\_\_\_ mL/min N/A
- ☒ Test Photometric noise, STDV = 0.0002 Abs (should be  $\leq 0.00050$  Abs)
- ☐ Flame, Test high solids nebulizer setting use  
-Al/acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision  
(%RSD) = \_\_\_\_\_ % (should be  $> 0.35$  Abs and  $< 0.5\%$  RSD)  
or  
-N2O/acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision  
(%RSD) = \_\_\_\_\_ % (should be  $> 0.3$  Abs and  $< 0.5\%$  RSD)
- ☒ Furnace, Characteristic mass and sensitivity Cu 25 ppb = 0.16 Abs, and Precision (%RSD) = 3 % (should be  $\geq 0.15$  Abs and  $\leq 4.0\%$  RSD)

SIGN:

Engineer: Suniga Mecharoen

Customer: Water Analysis Center Co., Ltd.

2/2



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PREVENTATIVE MAINTENANCE (PM) CHECK LIST

FOR ATOMIC ABSORPTION SPECTROMETER

Model & Serial Number: AA240F3 & AA09117073

Customer: Water Analysis Center Co., Ltd.

Date: 12 Feb 2024

Safety

- ☒ Flame, Inspect/replace o-ring nebulizer, spray chamber and burner
- ☒ Flame, Clean nebulizer, spray chamber and burner
- ☒ Flame, Check liquid trap interlock, burner interlock, pressure relief bung interlock and shield interlock
- ☐ Furnace, Clean work head, electrode and shroud N/A
- ☐ Furnace, Clean PSD and PSD tray N/A
- ☐ Furnace, Check water pressure N/A
- ☒ Check drain tube
- ☒ Check exhaust system
- ☒ Check gas pressure sensor interlock
- ☒ Check and all gas hoses for SpectraAA
- ☒ Clean computer control

Optics

- ☒ Inspect/Replace that external optics surfaces
- ☒ Check Wavelength Accuracy the copper line at 323.0-326.0 nm = 324.7 nm
- ☒ Check that PMT % Gain the copper at 324.8 nm, 4 mA, 0.5 nm slit width, Gain = 94% (should be  $\leq 64\%$  or  $\leq 380V$ )
- ☒ Flame, Check D2 lamp is work

1/2

FR-SV-023 Rev 01



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## Electronics

- ☒ Check power supply voltage
- ☒ Check cables and connectors
- ☒ Check/Clean all boards in the instrument
- ☐ Furnace, Check camera and align\*\* N/A

\*\*Option for Graphite Zeeman only

## Mechanisms

- ☒ Flame, Check the burner adjuster
- ☐ Furnace, Check PSD accessories N/A

## Analytical performance

- ☒ Clear the sample compartment
- ☒ Flame, Check uptake rate form 7.2-10.6 mL per minute = 9.5 mL/min
- ☒ Test Photometric noise, STDV = 0.0003 Abs (should be  $\leq 0.00050$  Abs)
- ☒ Flame, Test high solids nebulizer setting use
- ☐ -Air/acct Cu 5 ppm = 0.75 Abs, and Precision (%RSD) = 0.3 % (should be  $> 0.55$  Abs and  $< 0.5\%$  RSD)
- ☐ or
- ☐ -N2O/Acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision (%RSD) = \_\_\_\_\_ % (should be  $> 0.3$  Abs and  $< 0.5\%$  RSD)
- ☐ Furnace, Characteristic mass and sensitivity Cu 25 ppb = \_\_\_\_\_ Abs, and Precision (%RSD) = \_\_\_\_\_ % (should be  $\geq 0.15$  Abs and  $\leq 4.0\%$  RSD)

## SIGN :

Engineer : Sunisa Naeharoen Customer : Mr. Pawut Wongnarakornkul

2/2

FB-SV-001 Rev. 05



## MEGAFIL CO., LTD.

99/183 Moo 3 Tambon Bang Rak Noi Amphur Muang Nonthaburi 11000  
Tel. 0-2528-6081-2 Fax. 0-2528-6083, 0-2525-7034  
www.megafil.co.th E-mail : megafil.group@gmail.com

## BSC Certification Test Report

Page 1 of 6

Certificate No. : M1439/24

Customer Name : LABORATORY WATER ANALYSIS CENTER COMPANY LIMITED

Customer Address : 1/94 Moo 5 Khan Ham Subdistrict,  
Uthai District, Phra Nakhon Si Ayutthaya 13210

Equipment : Biological Safety Cabinet Class II Type A2

Manufacturer : Microtech

Model : V6-T

Serial No. : 0972k097272

ID No. : WWL 0084

Were in accordance with ☒ EN 12469 ☐ NSF 49 ☐ Manufacturer's specification

Test Date : 15/10/2024

Due Date : 15/10/2025 or after HEPA filters are replaced or unit is moved

Test by : Mr. Pawut Wongnarakornkul

Approved by :

(Mr.Krudsada Thinhustoei)  
Authorized Signatory

Issued Date : 16/10/2024

This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

This certificate may not be reproduced other than in full except with the prior written approval of the Megafil Company Limited.

Megafil Co.,Ltd.

MG-FM-7.8-001, R00 (01/07/19)



## MEGAFIL CO., LTD.

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Page 2 of 6

Certificate No. : M1439/24

- Procedure Used :
- European Standard EN12469 : 2000 has the status of British Standard, Biotechnology Performance criteria for microbiological safety cabinets.
  - NSF International Standard / American National Standard NSF / ANSI 49-2008 Biosafety Cabinet : Design, Construction, Performance and Field Certification.
  - Australian Standard : AS 1807.23-2000 Determination of intensity of radiation from germicidal ultraviolet lamps.
  - Manufacturer's specification.

## 1. Downflow velocity test.

### Measurement Information

No. of Rows	No. of Readings	Grid Spacing Front-Back	Grid Spacing Side-Side	Probe height Above sash
2	8	1/4,3/4	1/8,3/8	100mm

### Measurement Data. (m/s.)

0.37	0.43	0.41	0.39
0.36	0.35	0.32	0.34

Average velocity 0.37 m/s ( 73 FPM.) Velocity range 0.32-0.50 m/s ( 66-98 FPM.)

Uniformity( EN: +/-20%avg.) 0.30 - 0.44 m/s ( 58 - 88 FPM.)

Supply filter dimension 24 x 72 (inch x inch) Supply filter area 10.69 SQ.FT

Downflow volume (Q) 780 CFM.

Result Summary ☒ Pass ☐ Fail

Equipment used : Thermo Anemometer Model 425 S/N : 02968605 Calibration date : 10/05/2024

Megafil Co.,Ltd.

MG-FM-7.8-001, R00 (01/07/19)

ภาคผนวก ข-6



## MEGAFIL CO., LTD.

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Page 3 of 6

Certificate No. : M1439/24

## 2. Inflow velocity test.

Select method. : ☐ DIM ☒ Exhaust velocity. ☐ MFG's Specifications

MFG's Specifications method

0.54	0.37	0.55	0.54	0.55
0.56	0.55	0.56	0.57	0.54
0.59	0.53	0.54	0.57	0.56
0.53	0.6	0.56	0.55	0.58
0.55	0.58	0.54	0.53	0.55

( m/s. )

Average Inflow velocity 0.47 m/s (93 FPM.) Velocity range 0.40 m/s ( 87 FPM.)

Inflow dimension 8 x 72 (inch x inch) Inflow area 4.00 SQ.FT

Inflow volume(Q) 372 CFM

Result Summary ☒ Pass ☐ Fail

Adjustments Required ☐ Fan Speed ☐ Damper

Equipment used : Thermo Anemometer Model 425 S/N : 02968605 Calibration date : 10/05/2024

## 3. HEPA filter leak test.

### Measurement Data

HEPA Filter	PAO Upstream Conc.(calculated)	Specification	Measured leak penetration
Supply HEPA Filter	18 $\mu$ g/l.	<0.01%	<0.01%
Exhaust HEPA Filter	18 $\mu$ g/l.	<0.01%	<0.01%

Megafil Co.,Ltd.

MG-FM-7.8-001, R00 (01/07/19)



Certificate No. : M1439/24

#### Leak location

Supply HEPA Filter

Back



Exhaust HEPA Filter

Back



#### Result Summary

☒ Pass

☐ Fail

Equipment used : Aerosol Photometer Model TDA-2H S/N : 20138 Calibration date : 08/05/2024

Equipment used : Smoke Generator Model TDA-6C S/N : 20192

#### 4. Airflow smoke patterns test

##### Measurement Information

- Downflow Pattern test : Smoke shall be passed from one end of the cabinet to the other, along the centerline of the work surface, at a height of 4 inch (10 cm) above the top of the access opening
- View screen retention test : Smoke shall be passed from one end of the cabinet to the other, 1.0 in (2.5 cm) behind the view screen, at a height 6.0 inch (15 cm) above the top of the access opening.
- Work opening edge retention test : Smoke shall be passed along the entire perimeter of the work opening. Particular attention should be paid to corners and vertical edges.
- Sash/window seal test : Smoke shall be passed up the inside of the window 2 in (5 cm) from the sides and along the top of the work area.

Certificate No. : M1439/24

#### Result Summary

Downflow Pattern test	<input checked="" type="checkbox"/> Accept	<input type="checkbox"/> Non-Conforming
View screen retention test	<input checked="" type="checkbox"/> Accept	<input type="checkbox"/> Non-Conforming
Work opening edge retention test	<input checked="" type="checkbox"/> Accept	<input type="checkbox"/> Non-Conforming
Sash/window seal test	<input checked="" type="checkbox"/> Accept	<input type="checkbox"/> Non-Conforming

#### 5. Site Installation

Sash Alarm.	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A
Interlock System.	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A
Exhaust System Performance	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A

#### Remark / Recommendation

ระบุ Site installation ไม่มีการตรวจสอบ เนื่องจากตู้ไม่เปิดใช้งาน

#### 6. Illumination Test (Lighting) : Option

Lighting should be adequate for safe working within the cabinet. Illumination measured at the work surface.

Lux

585	936	917	514
849	1400	1465	755

Equipment used : Digital Light Meter Model Easy View 31 S/N : 160404993 Calibration date : 08/05/2024

#### Remark :

Certificate No. : M1439/24

#### 7. Ultraviolet Lamp Test (UV) : Option

Ultraviolet radiation where UV Lamp are fitted, the intensity of radiation at a wavelength of 254 nm. Shall be not less than 400 mW/m<sup>2</sup> when measures at work floor surface.

mW/m<sup>2</sup>

630	1450	1480	690
380	920	930	390

Equipment used : UVC LIGHT METER Model UVC-254SD S/N : Q879819 Calibration date : 08/05/2024

#### Remark :

## Certificate of Calibration

LIQUID BATH



Certificate No. : MC 2314268

Page 1 of 3

Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U.-Thai, Ayutthaya 13210.

Reference Job No. : 23-2833 Received Date : 15 December 2023

Description : Water Bath

Manufacturer : ESSTELL Model : EWB-122D

Serial No. : 20180508122 ID. No. : WWL 0214

Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number ( MC 2314268 ) has been attached to the case.

Method : In-House calibration procedure MWI-T-029 this method is reference to ASTM E715 "Liquid Bath".

Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.

Environmental Condition : Ambient Temperature : ( 29.4 to 29.8 ) °C  
Relative Humidity : ( 49.0 to 52.0 ) %

Date of Calibration : 15 December 2023 Date of Issue : 19 December 2023

Checked by : Chalermkit Rakphada  
( Calibration Engineer )

Approved by : Aittipong Kanyanawest  
( Technical Manager )

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co., Ltd.

Certificate No.: MC 2314268

Page 2 of 3

**Reference Standard Instrument :**

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2301270	MY44020009	9 Mar 2024	MCAL
With Thermocouple Type "T" ID. No.271 to 275				

**Traceability :**

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

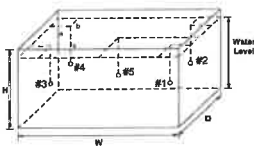
**1. Calibration Procedure:**

This Instrument was calibration according to ASTM E715 - 2007 by comparison with calibrated sensor under no load condition. The sensor were placed on five points and located one sensor in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the five sensor within 2.5 cm of the geometric center of the chamber.

**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. The reference sensor should preferably be located at the geometric center of the chamber.

**Temperature Stability** - one-half of the greatest maximum difference of measured temperatures at any one sensor.

**Overall Variation** - The Difference of the maximum and minimum measured temperatures throughout observation.



- Overall Ambient Temperature around the Chamber variation : 1.3 °C
- Overall Line Voltage variation : 0.0 V
- Chamber Size (W\*H\*D) : 50 cm x 12 cm x 30 cm
- Water Level : 7 cm

Checked by : Chalermkit

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

## Certificate of Calibration

### TEMPERATURE CONTROLLER ENCLOSURES



Certificate No.: MC 2314270

Page 1 of 3

Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.

Reference Job No. : 23-2833 Received Date : 15 December 2023  
Description : Incubator  
Manufacturer : Memmert Model : IN260  
Serial No. : D619.0170 ID. No. : WWL 0192  
Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number ( MC 2314270 ) has been attached to the case.  
Method : In-House calibration procedure MWI-T-033 this method is reference to TLAS G-20 "Temperature Controlled Enclosures".  
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.  
Environmental Conditions : Ambient Temperature : ( 25.2 to 25.6 ) °C  
Relative Humidity : ( 65.4 to 66.2 ) %  
Date of Calibration : 15 December 2023 Date of Issue : 19 December 2023

Checked by : Chalermkit Rakphada  
( Calibration Engineer )

Approved by : Aittipong Kananasit  
( Technical Manager )

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co., Ltd.

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Certificate No.: MC 2314268

Page 3 of 3

**2. Result of calibration :**

**Temperature Measurement Accuracy Test**

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations					Uncertainty (±°C)
	#1	#2	#3	#4	Ref. #5	
45.0	44.5	44.4	44.5	44.5	44.6	0.45

**Chamber Characterization Result**

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
44.5	45.0	45.0	0.62	0.88	1.5

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.0$ , providing a level of confidence of approximately 95 %.

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : Chalermkit

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Certificate No.: MC 2314270

Page 2 of 3

**Reference Standard Instrument :**

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2214032	MY41029992	26 Dec 2023	MCAL
With Thermocouple Type "T" ID. No.31/1 to 31/9				

**Traceability :**

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

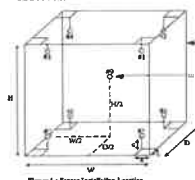
**1. Calibration Procedure:**

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

**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. The reference sensor should preferably be located at the geometric center of the chamber.

**Temperature Stability** - one-half of the greatest maximum difference of measured temperatures at any one sensor.

**Overall Variation** - The Difference of the maximum and minimum measured temperatures throughout observation.



- Overall Ambient Temperature around the Chamber variation : 0.4 °C
- Overall Line Voltage variation : 0.0 V
- Chamber Size (W\*H\*D) : 65 cm x 80 cm x 50 cm

Checked by : Chalermkit

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Certificate No.: MC 2314270

Page 3 of 3

2. Result of calibration :

Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. #9	
35.0	35.2	35.2	35.2	35.2	35.1	35.1	35.0	35.1	35.1	0.44

Chamber Characterization Result

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
35.0	35.0	35.0	0.13	0.21	0.4

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 %.

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : Chalermkita

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

**Certificate of Calibration**

**AUTOClave**



Certificate No.: MC 2314269

Page 1 of 3

Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U-Thai, Ayuthaya 13210.

Reference Job No. : 23-2833 Received Date : 15 December 2023  
Description : Autoclave  
Manufacturer : TOMY Model : Autoclave ES-315  
Serial No. : 51135128 ID. No. : WWL 0083  
Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number (MC 2314269) has been attached to the case.  
Method : In-House calibration procedure MWI-T-036 this method is reference to based on BS 2646 : 1993 Part 5 "Autoclave".  
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.  
Environmental Condition : Ambient Temperature : ( 29.4 to 30.7 ) °C  
Relative Humidity : ( 50.0 to 52.0 ) %  
Date of Calibration : 15 December 2023 Date of Issue : 19 December 2023

Checked by : Chalermkita  
Chalermkita Rakphada  
( Calibration Engineer )

Approved by : Aittipong Kanjanasit  
Aittipong Kanjanasit  
( Technical Manager )

The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Certificate No.: MC 2314269

Page 2 of 3

Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Temperature Recorder RTD 100 Ohm	MC 2300163	M79252	9 Jan 2024	MCAL
Temperature Recorder RTD 100 Ohm	MC 2300164	5978194	9 Jan 2024	MCAL
Temperature Recorder RTD 100 Ohm	MC 2300165	M79251	9 Jan 2024	MCAL

Traceability :

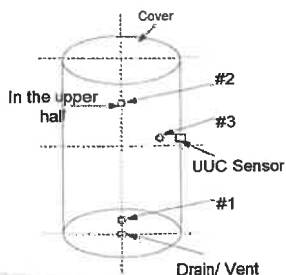
The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

1. Calibration Procedure:

The equipment list above was calibrated an accuracy of temperature in a chamber of the sterilizer.

The calibration was performed by direct measurement of generated temperatures using the standard thermometer with three temperature sensors. The data was recorded in a period of fifteen minutes of the sterilizing status. The temperature scale used was based on ITS-90.

The calibration of sterilizer was carried out at the point indicated by following the In-house calibration method No. MWI-T-036 based on BS 2646 : 1993 : Part 5 in Tests for performance section.



- Overall Line Voltage variation : 0.0 V

Checked by : Chalermkita

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Certificate No.: MC 2314269

Page 3 of 3

2. Result of calibration :

Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations			Uncertainty (±°C)
	#1	#2	#3	
121	121.72	121.73	121.95	0.61

Characterization Result

Desired Temperature (°C)	Setting Temperature (°C)	Timer Setting (min)	Indicating Temperature (°C)	Indicating Pressure (kPa)	Measured Stability (±°C)	Measured Uniformity (°C)	Overall Variation (°C)
121	121	15.0	121	120	0.60	0.35	1.35

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 %.

This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : Chalermkita

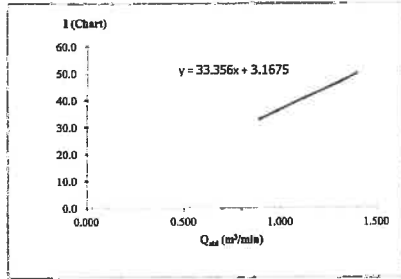
[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



### High Volume Air Sampler Calibration Worksheet

Project Site : งานอุตสาหกรรมโรงงาน (โครงการ 5) Page 1 of 1  
Location : วัดบ้านวัง  
Date of measurement : 08/10/2024  
Worksheet No. : C-081024-WWL0095 Calibration Office  
High Volume ID : WWL0095 Calibrator ID : WWL0103  
High Volume Model : TE-5170 (TSP) Calibrator Model : TE-5028A  
High Volume S/N : 2727 Calibrator S/N : 3271  
Ambient Condition : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 1.59186  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01922

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I (Chart)	IC (Corrected)	Linear Regression
1	4.90	1.397	50.0	49.80	Slope : 33.22 Intercept : 3.155 Correlation Coefficient : 0.9995
2	4.40	1.324	47.0	46.81	
3	3.20	1.131	41.0	40.83	
4	2.40	0.981	36.0	35.85	
5	2.00	0.897	33.0	32.87	



Calibrated by : [Signature]  
Mr. JITTAWEE WONGMAKHIEB

Approved by : [Signature]  
Mr. RUNGSASIKORN KOSUM

FO.LAB 5.5-1/25

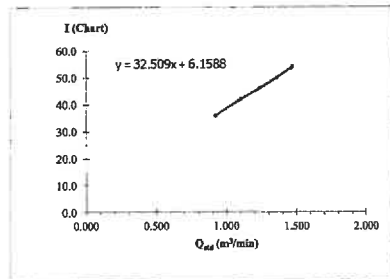
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### High Volume Air Sampler Calibration Worksheet

Project Site : งานอุตสาหกรรมโรงงาน (โครงการ 5) Page 1 of 1  
Location : โรงเรียนอนุบาลเทศบาลตำบลบ้านสร้าง  
Date of measurement : 08/10/2024  
Worksheet No. : C-081024-WWL0096 Calibration Office  
High Volume ID : WWL0096 Calibrator ID : WWL0103  
High Volume Model : TE-5170 (TSP) Calibrator Model : TE-5028A  
High Volume S/N : 2730 Calibrator S/N : 3271  
Ambient Condition : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 1.59186  
Barometric Pressure (mmHg) : 758 Quality Standard Intercept : -0.01922

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I (Chart)	IC (Corrected)	Linear Regression
1	5.40	1.466	54.0	53.78	Slope : 32.38 Intercept : 6.134 Correlation Coefficient : 0.9997
2	4.60	1.354	50.0	49.80	
3	3.80	1.232	46.0	45.81	
4	3.00	1.096	42.0	41.83	
5	2.10	0.919	36.0	35.85	



Calibrated by : [Signature]  
Mr. JITTAWEE WONGMAKHIEB

Approved by : [Signature]  
Mr. RUNGSASIKORN KOSUM

FO.LAB 5.5-1/25

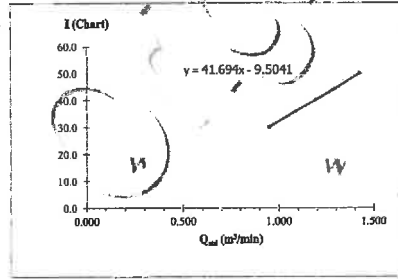
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### High Volume Air Sampler Calibration Worksheet

Project Site : งานอุตสาหกรรมโรงงาน (โครงการ 5) Page 1 of 1  
Location : วัดบ้านวัง  
Date of measurement : 08/10/2024  
Worksheet No. : C-081024-WWL0100 Calibration Office  
High Volume ID : WWL0100 Calibrator ID : WWL0103  
High Volume Model : TE-6070 (PM10) Calibrator Model : TE-5028A  
High Volume S/N : 2735 Calibrator S/N : 3271  
Ambient Condition : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 0.99709  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01199

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I (Chart)	IC (Corrected)	Linear Regression
1	5.00	1.422	50.0	31.44	Slope : 26.22 Intercept : -5.977 Correlation Coefficient : 0.9996
2	4.10	1.289	44.0	27.67	
3	3.50	1.192	40.0	25.13	
4	2.90	1.086	36.0	22.64	
5	2.20	0.947	30.0	18.87	



Calibrated by : [Signature]  
Mr. JITTAWEE WONGMAKHIEB

Approved by : [Signature]  
Mr. RUNGSASIKORN KOSUM

FO.LAB 5.5-1/25

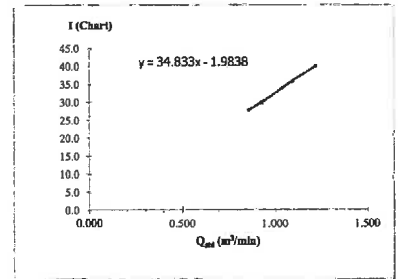
แก้ไขครั้งที่: 1 วันที่แก้ไข: 1 ต.ค. 2560 หน้า: 1 ของ 1



### High Volume Air Sampler Calibration Worksheet

Project Site : งานอุตสาหกรรมโรงงาน (โครงการ 5) Page 1 of 1  
Location : โรงเรียนอนุบาลเทศบาลตำบลบ้านสร้าง  
Date of measurement : 08/10/2024  
Worksheet No. : C-081024-WWL0101 Calibration Office  
High Volume ID : WWL0101 Calibrator ID : WWL0103  
High Volume Model : TE-6070 (PM10) Calibrator Model : TE-5028A  
High Volume S/N : 2733 Calibrator S/N : 3271  
Ambient Condition : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 0.99709  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01199

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m <sup>3</sup> /min)	I (Chart)	IC (Corrected)	Linear Regression
1	3.60	1.209	40.0	25.15	Slope : 21.90 Intercept : -1.247 Correlation Coefficient : 0.9998
2	2.90	1.086	36.0	22.64	
3	2.60	1.029	34.0	21.38	
4	2.10	0.926	30.0	18.87	
5	1.80	0.858	28.0	17.61	



Calibrated by : [Signature]  
Mr. JITTAWEE WONGMAKHIEB

Approved by : [Signature]  
Mr. RUNGSASIKORN KOSUM

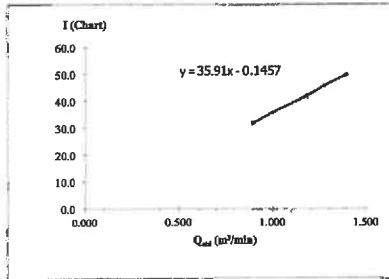
FO.LAB 5.5-1/25

แก้ไขครั้งที่: 1 วันที่แก้ไข: 1 ต.ค. 2560 หน้า: 1 ของ 1

High Volume Air Sampler Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะอุบลฯ (โครงการ 5) Page 1 of 1  
Location : วัดหนองเต็ง  
Date of measurement : 08/10/2024  
Worksheet No. : C-881024-WWL0097 Calibration Office  
High Volume ID : WWL0097 Calibrator ID : WWL0103  
High Volume Model : TE-5170 (TSP) Calibrator Model : TE-5028A  
High Volume S/N : 2726 Calibrator S/N : 3271  
Ambient Condition : Calibrate Date : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 1.59186  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01922

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m³/min)	I (Chart)	IC (Corrected)	Linear Regression
1	4.90	1.397	50.0	49.80	Slope : 35.77 Intercept : -0.145 Correlation Coefficient : 0.9996
2	4.30	1.279	46.0	45.81	
3	3.50	1.183	42.0	41.83	
4	2.50	1.001	36.0	35.85	
5	2.00	0.897	32.0	31.87	



Calibrated by : Mr. JITTAWEE WONGMAKHEB

Approved by : Mr. RUNGSASIKORN KOSUM

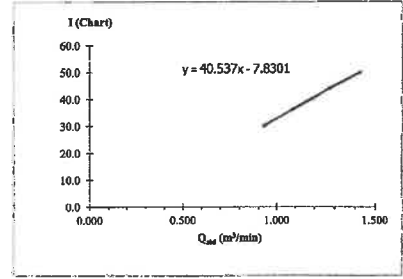
FO-LAB 5.5-1/25

แก้ไขครั้งที่ : วันที่ส่งคืนไฟล์ : 1 ต.ค. 2560 หน้า : 1 ของ 1

High Volume Air Sampler Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะอุบลฯ (โครงการ 5) Page 1 of 1  
Location : วัดหนองเต็ง  
Date of measurement : 08/10/2024  
Worksheet No. : C-881024-WWL0102 Calibration Office  
High Volume ID : WWL0102 Calibrator ID : WWL0103  
High Volume Model : TE-6070 (PM10) Calibrator Model : TE-5028A  
High Volume S/N : 2731 Calibrator S/N : 3271  
Ambient Condition : Calibrate Date : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 0.99709  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01199

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m³/min)	I (Chart)	IC (Corrected)	Linear Regression
1	5.00	1.422	50.0	31.44	Slope : 25.49 Intercept : -4.924 Correlation Coefficient : 0.9991
2	4.00	1.273	44.0	27.67	
3	3.50	1.192	40.0	25.15	
4	2.90	1.086	36.0	22.64	
5	2.10	0.926	30.0	18.87	



Calibrated by : Mr. JITTAWEE WONGMAKHEB

Approved by : Mr. RUNGSASIKORN KOSUM

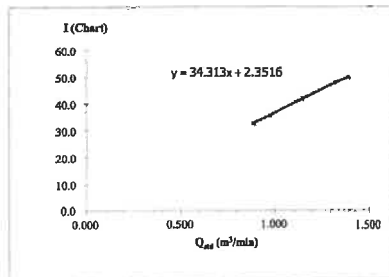
FO-LAB 5.5-1/25

แก้ไขครั้งที่ : วันที่ส่งคืนไฟล์ : 1 ต.ค. 2560 หน้า : 1 ของ 1

High Volume Air Sampler Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะอุบลฯ (โครงการ 5) Page 1 of 1  
Location : วัดหนองเต็ง  
Date of measurement : 08/10/2024  
Worksheet No. : C-881024-WWL0223 Calibration Office  
High Volume ID : WWL0223 Calibrator ID : WWL0103  
High Volume Model : TE-5170 (TSP) Calibrator Model : TE-5028A  
High Volume S/N : 2738 Calibrator S/N : 3271  
Ambient Condition : Calibrate Date : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 1.59186  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01922

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m³/min)	I (Chart)	IC (Corrected)	Linear Regression
1	4.90	1.397	50.0	49.80	Slope : 34.17 Intercept : 2.342 Correlation Coefficient : 0.9995
2	4.40	1.324	46.0	47.81	
3	3.30	1.149	42.0	41.83	
4	2.40	0.981	36.0	35.85	
5	2.00	0.897	32.0	32.87	



Calibrated by : Mr. JITTAWEE WONGMAKHEB

Approved by : Mr. RUNGSASIKORN KOSUM

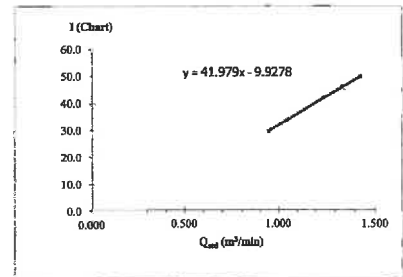
FO-LAB 5.5-1/25

แก้ไขครั้งที่ : วันที่ส่งคืนไฟล์ : 1 ต.ค. 2560 หน้า : 1 ของ 1

High Volume Air Sampler Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะอุบลฯ (โครงการ 5) Page 1 of 1  
Location : วัดหนองเต็ง  
Date of measurement : 08/10/2024  
Worksheet No. : C-881024-WWL0224 Calibration Office  
High Volume ID : WWL0224 Calibrator ID : WWL0103  
High Volume Model : TE-6070 (PM10) Calibrator Model : TE-5028A  
High Volume S/N : 2739 Calibrator S/N : 3271  
Ambient Condition : Calibrate Date : 27/03/2024  
Temperature (°C) : 26 Quality Standard Slope : 0.99709  
Barometric Pressure (mmHg) : 756 Quality Standard Intercept : -0.01199

Test No.	delta H <sub>2</sub> O (inch)	Q <sub>std</sub> (m³/min)	I (Chart)	IC (Corrected)	Linear Regression
1	5.00	1.422	50.0	31.44	Slope : 26.40 Intercept : -6.243 Correlation Coefficient : 0.9998
2	4.40	1.335	46.0	28.93	
3	3.80	1.241	42.0	26.41	
4	2.70	1.048	36.0	21.38	
5	2.20	0.947	30.0	18.87	



Calibrated by : Mr. JITTAWEE WONGMAKHEB

Approved by : Mr. RUNGSASIKORN KOSUM

FO-LAB 5.5-1/25

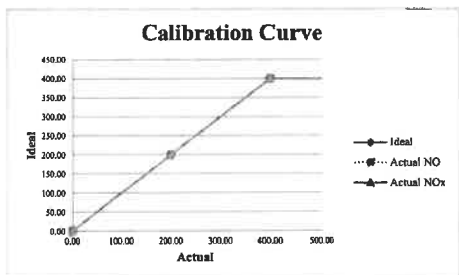
แก้ไขครั้งที่ : วันที่ส่งคืนไฟล์ : 1 ต.ค. 2560 หน้า : 1 ของ 1

### Nitrogen Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดบ้านช้าง  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0115  
Ambient NOx Analyzer ID : WWL 0115  
Manufacturer : HORIBA  
Ambient NOx Analyzer Model : APNA-370  
Ambient NOx Analyzer S/N : 705KA91J

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023  
Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NO <sub>x</sub>	Error NO <sub>x</sub>	%Error NO <sub>x</sub>
ZERO	0.00	0.10	0.10	-	0.00	0.00	-
SPAN 200 ppb	200.00	200.10	0.10	0.05	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03	400.10	0.10	0.03
AVERAGE (%)				0.04	0.04		



Calibrated by (Miss SUTHIDA SINGHAPHEN)  
Chemist

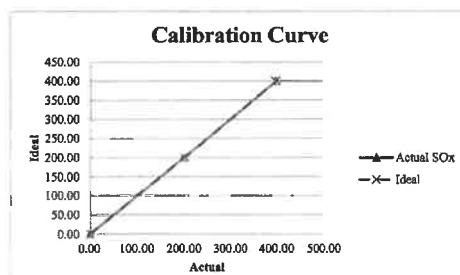
Approved by (Mr. RUNGSASIKORN KOSUM)  
Technical Management

### Sulfur Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดบ้านช้าง  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0110  
Ambient SOx Analyzer ID : WWL 0110  
Manufacturer : HORIBA  
Ambient SOx Analyzer Model : APSA-370  
Ambient SOx Analyzer S/N : Y8SW7T00

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023  
Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS			
	Ideal	Actual SOx	Error Sox	%Error Sox
ZERO	0.00	0.00	0.00	-
SPAN 200 ppb	200.00	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03
AVERAGE (%)				0.04



Calibrated by (Miss SUTHIDA SINGHAPHEN)  
Chemist

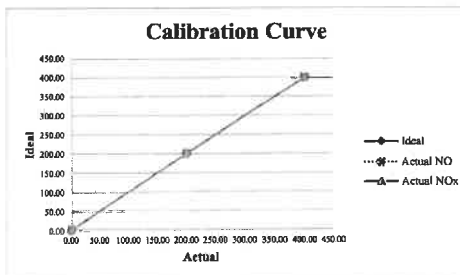
Approved by (Mr. RUNGSASIKORN KOSUM)  
Technical Management

### Nitrogen Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : โรงเรียนอนุบาลเทศบาลตำบลบ้านช้าง  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0116  
Ambient NOx Analyzer ID : WWL 0116  
Manufacturer : HORIBA  
Ambient NOx Analyzer Model : APNA-370  
Ambient NOx Analyzer S/N : 9BRKGTUK

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023  
Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NO <sub>x</sub>	Error NO <sub>x</sub>	%Error NO <sub>x</sub>
ZERO	0.00	0.10	0.10	-	0.00	0.00	-
SPAN 200 ppb	200.00	200.20	0.20	0.10	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03	400.10	0.10	0.03
AVERAGE (%)				0.06	0.04		



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Chemist

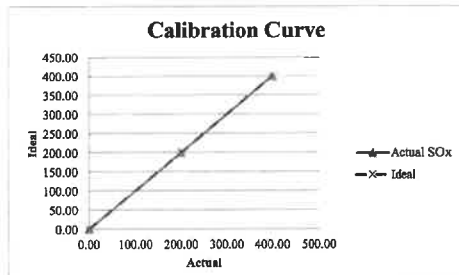
Approved by (Mr. RUNGSASIKORN KOSUM)  
Technical Management

### Sulfur Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : โรงเรียนอนุบาลเทศบาลตำบลบ้านช้าง  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0112  
Ambient SOx Analyzer ID : WWL 0112  
Manufacturer : HORIBA  
Ambient SOx Analyzer Model : APSA-370  
Ambient SOx Analyzer S/N : 8R18JBBF

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023  
Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS			
	Ideal	Actual SOx	Error Sox	%Error Sox
ZERO	0.00	0.00	0.00	-
SPAN 200 ppb	200.00	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03
AVERAGE (%)				0.04



Calibrated by (Miss SUTHIDA SINGHAPHEN)  
Chemist

Approved by (Mr. RUNGSASIKORN KOSUM)  
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194 Moo 5, T.Khanom, A.U.-Thai, Ayutthaya 13210, Thailand  
Tel: 0-35226-383, 0-35800-593 Fax: 0-35800-594

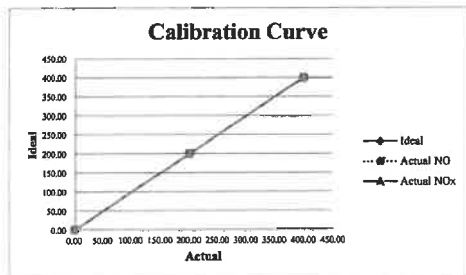
#### Nitrogen Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดโคกเคียน  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0115  
Ambient NO<sub>x</sub> Analyzer ID : WWL 0115  
Manufacturer : HORIBA  
Ambient NO<sub>x</sub> Analyzer Model : APNA-370  
Ambient NO<sub>x</sub> Analyzer S/N : W2VNUX08

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023

Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NO <sub>x</sub>	Error NO <sub>x</sub>	%Error NO <sub>x</sub>
ZERO	0.00	0.10	0.10	-	0.10	0.10	-
SPAN 200 ppb	200.00	200.10	0.10	0.05	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03	400.10	0.10	0.03
AVERAGE (%)				0.04	0.04		



Calibrated by   
(Miss SUTHIDA SINGHAPHEN)  
Chemist

Approved by   
(Mr. RUNGSASIKORN KOSUM)  
Technical Management



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194 Moo 5, T.Khanom, A.U.-Thai, Ayutthaya 13210, Thailand  
Tel: 0-35226-383, 0-35800-593 Fax: 0-35800-594

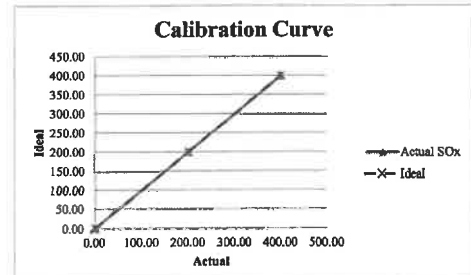
#### Sulfur Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดโคกเคียน  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0113  
Ambient SO<sub>x</sub> Analyzer ID : WWL 0113  
Manufacturer : HORIBA  
Ambient SO<sub>x</sub> Analyzer Model : APSA-370  
Ambient SO<sub>x</sub> Analyzer S/N : WDMY8HT8

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2023

Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS			
	Ideal	Actual SO <sub>x</sub>	Error Sox	%Error Sox
ZERO	0.00	0.10	0.10	-
SPAN 200 ppb	200.00	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.20	0.20	0.05
AVERAGE (%)				0.05



Calibrated by   
(Miss SUTHIDA SINGHAPHEN)  
Chemist

Approved by   
(Mr. RUNGSASIKORN KOSUM)  
Technical Management



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194 Moo 5, T.Khanom, A.U.-Thai, Ayutthaya 13210, Thailand  
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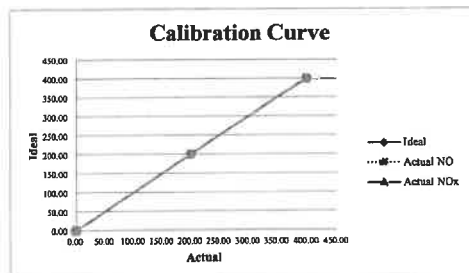
#### Nitrogen Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดหนองน้ำเคียน  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0022  
Ambient NO<sub>x</sub> Analyzer ID : WWL 0022  
Manufacturer : HORIBA  
Ambient NO<sub>x</sub> Analyzer Model : APNA-370  
Ambient NO<sub>x</sub> Analyzer S/N : 42C-70968-367

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2024

Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NO <sub>x</sub>	Error NO <sub>x</sub>	%Error NO <sub>x</sub>
ZERO	0.00	0.10	0.10	-	0.10	0.10	-
SPAN 200 ppb	200.00	200.00	0.00	0.00	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.10	0.10	0.03	400.10	0.10	0.03
AVERAGE (%)				0.01	0.04		



Calibrated by   
(Miss SUTHIDA SINGHAPHEN)  
Chemist

Approved by   
(Mr. RUNGSASIKORN KOSUM)  
Technical Management



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194 Moo 5, T.Khanom, A.U.-Thai, Ayutthaya 13210, Thailand  
Tel: 0-35226-383, 0-35800-593 Fax: 0-35800-594

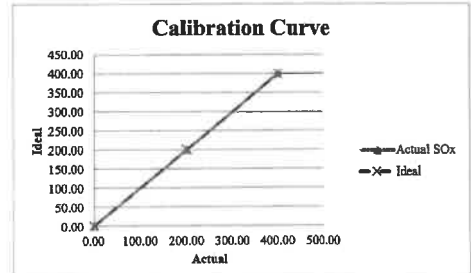
#### Sulfur Dioxide Analyzer Calibration Worksheet

Project Site : สวนอุตสาหกรรมโรจนะ อุตสาหกรรม (โครงการ 5)  
Location : วัดหนองน้ำเคียน  
Date of measurement : 08 October 2024  
Worksheet No. : C-081024-WWL 0021  
Ambient SO<sub>x</sub> Analyzer ID : WWL 0021  
Manufacturer : Thermo Environmental Instruments Inc  
Ambient SO<sub>x</sub> Analyzer Model : 43C  
Ambient SO<sub>x</sub> Analyzer S/N : 43C-58282-317

Multi Gas Calibrator  
Calibrator ID : WWL0124  
Calibrator Model : Series 6100  
Calibrator S/N : S/N 7462  
Calibrate Date : 08 March 2024

Cylinder Std. Gas  
Std. Gas Concentration (PPM) : 50.90  
Cylinder Pressure (psi) : 2000  
Certified Date : 07 December 2021  
Expired Date : 07 December 2025  
Serial No. : CC241587

Point	CALIBRATION RESULTS			
	Ideal	Actual SO <sub>x</sub>	Error Sox	%Error Sox
ZERO	0.00	0.10	0.10	-
SPAN 200 ppb	200.00	200.10	0.10	0.05
SPAN 400 ppb	400.00	400.20	0.20	0.05
AVERAGE (%)				0.05



Calibrated by   
(Miss SUTHIDA SINGHAPHEN)  
Chemist

Approved by   
(Mr. RUNGSASIKORN KOSUM)  
Technical Management

แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

### การทวนสอบก่อนออกหน้างาน

### การทวนสอบหลังจากออกหนังสือ

อุณหภูมิ (°C) 25 เกณฑ์การยอมรับ 23.0±3.0  
 ความชื้นสัมพัทธ์ (%) 57 เกณฑ์การยอมรับ 50.0±15.0  
 วันที่ทดสอบ 17/10/67

ผู้บันทึก \_\_\_\_\_  
ผู้ตรวจสอบ \_\_\_\_\_

ผู้บันทึก .....  
ผู้ตรวจสอบ .....

แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

**การทวนสอบก่อนออกก้นน้ำ**

การทวนสอบหลังจาการออกหน้างาน

อุณหภูมิ (°C) 25 เกณฑ์การยอมรับ 23.0±3.0  
ความชื้นสัมพัทธ์ (%) 57 เกณฑ์การยอมรับ 50.0±15.0  
วันที่ทดสอบ 17/10/67

ผู้บันทึก 2767  
ผู้ตรวจสอบ Ch

ผู้บันทึก           อนันต์            
ผู้ตรวจสอบ                         

แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

การรวมสหกรณ์ออกหน้างาน

การทวนสอบหลังจากออกหน้างาน

อุณหภูมิ (°C) 25 เกณฑ์การยอมรับ 23.0±3.0  
ความชื้นสัมพัทธ์ (%) 57 เกณฑ์การยอมรับ 50.0±15.0  
วันที่ทวนสอบ 17/10/67

ผู้บันทึก                       
 ผู้ตรวจสอบ                     

ผู้บันทึก นางน  
ผู้ตรวจสอบ น

### แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

### การตรวจสอบก่อนออกจำหน่าย

การทวนสอบห้องอากาศออกหน้างาน

อุณหภูมิ (°C) 25 เกณฑ์การยอมรับ 23.0±3.0  
ความชื้นสัมพัทธ์ (%) 57 เกณฑ์การยอมรับ 50.0±15.0  
วันที่ทดสอบ 17/10/67

ผู้บันทึก นางนง  
ผู้ตรวจสอบ                     

ผู้บันทึก .....  
ผู้ตรวจสอบ .....



แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

เครื่อง CA111 Sound Calibrator S/N 520272

รหัสเครื่องมือ SR004

เกณฑ์การยอมรับ 93.77 ± 0.3, 113.88 ± 0.3

วันที่สอบเทียบ 09/05/67

วันที่สอบเทียบครั้งต่อไป 08/05/68

เครื่อง Digital Thermohygro Meter S/N 105091609

รหัสเครื่องมือ WWL 0055

วันที่สอบเทียบ 29/11/66

วันที่สอบเทียบครั้งต่อไป 28/11/67

เครื่อง Sound Level Meter S/N 820956

รหัสเครื่องมือ WWL 0225

วันที่สอบเทียบ 12/02/67

วันที่สอบเทียบครั้งต่อไป 11/02/69

การทวนสอบก่อนออกจำหน่าย

การทวนสอบหลังจากออกจำหน่าย

อุณหภูมิ (°C) 25

เกณฑ์การยอมรับ 23.0±3.0

ความชื้นสัมพัทธ์ (%) 58

เกณฑ์การยอมรับ 50.0±15.0

วันที่ทวนสอบ 14/10/67

อุณหภูมิ (°C) 25


เกณฑ์การยอมรับ 23.0±3.0


ความชื้นสัมพัทธ์ (%) 58

เกณฑ์การยอมรับ 50.0±15.0


วันที่ทวนสอบ 14/10/67


Item	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 94.0dB)	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 114.0dB)
1	93.8	113.9
2	93.8	113.9
3	93.8	113.9
4	93.8	113.9
5	93.8	113.9
6	93.8	113.9
7	93.8	113.9
8	93.8	113.9
9	93.8	113.9
10	93.8	113.9
X	93.80	113.90
SD	0.00	0.00
%RSD (≤ 10)	0.00	0.00
ผลการ ทวนสอบ	ผ่าน	ผ่าน

ผู้บันทึก 

ผู้ตรวจสอบ 

Item	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 94.0dB)	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 114.0dB)
1	93.8	113.9
2	93.8	113.9
3	93.8	113.9
4	93.8	113.9
5	93.8	113.9
6	93.8	113.9
7	93.8	113.9
8	93.8	113.9
9	93.8	113.9
10	93.8	113.9
X	93.80	113.90
SD	0.00	0.00
%RSD (≤ 10)	0.00	0.00
ผลการ ทวนสอบ	ผ่าน	ผ่าน

ผู้บันทึก 

ผู้ตรวจสอบ 

แบบบันทึกการทวนสอบเครื่อง Sound Level Meter

เครื่อง CA111 Sound Calibrator S/N 520272

รหัสเครื่องมือ SR004

เกณฑ์การยอมรับ 93.77 ± 0.3, 113.88 ± 0.3

วันที่สอบเทียบ 09/05/67

วันที่สอบเทียบครั้งต่อไป 08/05/68

เครื่อง Digital Thermohygro Meter S/N 105091609

รหัสเครื่องมือ WWL 0055

วันที่สอบเทียบ 29/11/66

วันที่สอบเทียบครั้งต่อไป 28/11/67

เครื่อง Sound Level Meter S/N 820957

รหัสเครื่องมือ WWL 0226

วันที่สอบเทียบ 12/02/67

วันที่สอบเทียบครั้งต่อไป 11/02/69

การทวนสอบก่อนออกจำหน่าย

การทวนสอบหลังจากออกจำหน่าย

อุณหภูมิ (°C) 25

เกณฑ์การยอมรับ 23.0±3.0

ความชื้นสัมพัทธ์ (%) 58

เกณฑ์การยอมรับ 50.0±15.0

วันที่ทวนสอบ 14/10/67

อุณหภูมิ (°C) 25


เกณฑ์การยอมรับ 23.0±3.0


ความชื้นสัมพัทธ์ (%) 58

เกณฑ์การยอมรับ 50.0±15.0


วันที่ทวนสอบ 14/10/67

Item	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 94.0dB)	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 114.0dB)
1	93.8	113.9
2	93.8	113.9
3	93.8	113.9
4	93.8	113.9
5	93.8	113.9
6	93.8	113.9
7	93.8	113.9
8	93.8	113.9
9	93.8	113.9
10	93.8	113.9
X	93.80	113.90
SD	0.00	0.00
%RSD (≤ 10)	0.00	0.00
ผลการ ทวนสอบ	ผ่าน	ผ่าน

ผู้บันทึก 

ผู้ตรวจสอบ 

Item	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 94.0dB)	ระดับเสียงที่วัดได้ (dB) (ความดังที่ 114.0dB)
1	93.8	113.9
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5	93.8	113.9
6	93.8	113.9
7	93.8	113.9
8	93.8	113.9
9	93.8	113.9
10	93.8	113.9
X	93.80	113.90
SD	0.00	0.00
%RSD (≤ 10)	0.00	0.00
ผลการ ทวนสอบ	ผ่าน	ผ่าน

ผู้บันทึก 

ผู้ตรวจสอบ 