

ภาคผนวก ง.

เอกสารผลการสอบเทียบเครื่องมือตรวจวัด

ประจำเดือนตุลาคม พ.ศ. 2565



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-001-384-5

32/3-4 หมู่ที่ 4 ตำบลท้ายเกาะ อำเภอสสามโคก จังหวัดปทุมธานี 12160. โทร 02-001-384-5

www.ecoconsult-lab.com Tax Identification Number : 0135559001081

TSP High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 6, 2022
Sampler Location	บริเวณพื้นที่โครงการ	Sampler Number	TSP No.3	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

CONDITIONS

Actual Temperature (Ta) (deg C°)	30	Corrected Temperature (Ta) (deg K)	303
Actual pressure (Pa)(mm Hg)	756	Corrected pressure (Pa)(mm Hg)	756
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

TEST

Plate No.	H ₂ O (In)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	0.8	0.71511	2.00	1.98
7	1.4	0.94183	3.30	3.26
10	1.9	1.09507	4.60	4.55
13	2.5	1.25423	5.90	5.84
18	3	1.37271	6.90	6.83

LINEAR REGRESSION	
Slope	7.47073
Intercept	-3.54529
Corr. Coeff (r)	0.9965
# of Observation	5
Corr. Coeff (r ²)	0.99304

$$y = 7.47073x - 3.54529$$

$$R^2 = 0.99304$$

IC (corrected)

Qstd-IC

15.0

12.0

9.0

6.0

3.0

0.0

0.0

0.5

1.0

1.5

2.0

2.5

3.0

Qstd (m³/min)

Test by :

Atiratt T.

(Mr. Atiratt Thaipradit)

Environmental Monitoring Manager



Approved by :

Ms. Phattaraporn Muepet

(Ms. Phattaraporn Muepet)

Environmental Report Manager



ECO CONSULTANT COMPANY LIMITED.

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www.ecoconsult-lab.com Tax Identification Number : 0135559001081

PM10 High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 6, 2022
Sampler Location	บริเวณพื้นที่โครงการ	Sampler Number	PM10 No.3	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

CONDITIONS

Actual Temperature (Ta) (deg C°)	30	Corrected Temperature (Ta) (deg K)	303
Actual pressure (Pa)(mm Hg)	756	Corrected pressure (Pa)(mm Hg)	756
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

TEST

Plate No.	H ₂ O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	1.4	0.94183	2.40	2.37
7	1.9	1.09507	3.90	3.86
10	2.5	1.25423	5.70	5.64
13	3.1	1.39519	7.00	6.93
18	3.8	1.54331	8.40	8.31

LINEAR REGRESSION	
Slope	9.94539
Intercept	-6.96959
Corr. Coeff (r)	0.9994
# of Observation	5
Corr. Coeff (r ²)	0.99876

$$y = 9.94539x - 6.96959$$

$$R^2 = 0.99876$$

IC (corrected)

Qstd-IC

15.0

12.0

9.0

6.0

3.0

0.0

0.0

0.5

1.0

1.5

2.0

2.5

3.0

Qstd (m³/min)

Test by :

Atirad T.

(Mr. Atirad Thaipradit)

Environmental Monitoring Manager



Approved by :

Ms. Phattaraporn Meepet

(Ms. Phattaraporn Meepet)

Environmental Report Manager



RECALIBRATION

DUE DATE:

April 4, 2023

Certificate of Calibration

Calibration Certification Information

Cal. Date: April 4, 2022 Rootsmeter S/N: 438320 Ta: 291 °K
Operator: Jim Tisch Pa: 748.8 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: 3441

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4040	3.2	2.00
2	3	4	1	0.9980	6.4	4.00
3	5	6	1	0.8920	7.9	5.00
4	7	8	1	0.8510	8.8	5.50
5	9	10	1	0.7000	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0046	0.7156	1.4205	0.9957	0.7092	0.8816
1.0003	1.0023	2.0089	0.9915	0.9934	1.2468
0.9983	1.1192	2.2461	0.9894	1.1092	1.3940
0.9971	1.1717	2.3557	0.9882	1.1613	1.4620
0.9917	1.4167	2.8411	0.9829	1.4042	1.7632
QSTD	m=	2.02829	QA	m=	1.27008
	b=	-0.02643		b=	-0.01640
	r=	0.99995		r=	0.99995

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
Qstd=	Vstd/ΔTime	Qa=	Va/ΔTime
For subsequent flow rate calculations:			
Qstd=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions

Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter 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 B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



Certificate of Calibration



Certificate No.:	PTC/07/22285	Page:	1 of 2
Equipment:	Digital Balance	Condition:	Normal
Manufacturer:	Mettler Toledo	Serial No:	B405267423
Model:	XP205	ID No:	-
Type of Balance:	Single interval		

Customer: ECO CONSUL TANT CO.,LTD
32-3-4, Moo.4 Tai Koh,
Samkhon, Pathumthani 12160

Environment Condition: Temperature 22.3 °C \pm 0.3 °C
Humidity 50.0 %RH \pm 2.0 %RH
Air density 1.18 kg/m³

Calibration Place: ECO CONSUL TANT CO.,LTD (ห้างเครื่องชั่ง)
32-3-4, Moo.4 Tai Koh,
Samkhon, Pathumthani 12160

The Method used: In house method, PTC-WI-07, base on Euramet cg. 18

Traceability: This certificate is traceable to the SI Units through Thai Calibration Service Co.,Ltd.
, NSC-ONSC Accreditation No.: Calibration 0189

Date Received: September 20, 2022

Calibration Date: September 20, 2022

Issued Date: September 23, 2022

Calibration By: Mr. Keattisak Kerdto

(Mr.Kriangsak Kalasri)
Reviewed by

Approved By :



(Mr. Keattisak Kerdto)
Laboratory Manager

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 recognised national standard laboratories.

The measurement uncertainty stated is 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). The effect that the results relate only to the items calibrated.

This calibration certificate shall not be reproduced except in full only, without written approval from penta calibration co., ltd



Certificate No.: PTC/07/22285

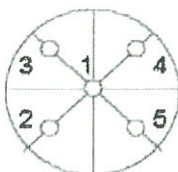
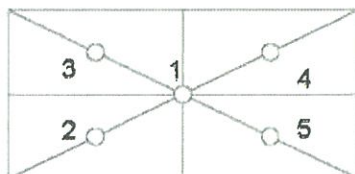
Page: 2 of 2

Measurement Results:

Without Adjustment :

Function Calibration: Internal Calibration

Eccentric Error: Weight to be 1/3 ,1/2 or of Maximum capacity



Eccentricity test 100000 (mg)

Position (mg)				
1	2	3	4	5
0.00	-0.01	0.00	0.01	-0.01
Maximum deviation:				0.01

Repeatability Test : Weight to be $1/2 \leq L_1 \leq$ Maximum capacity

Determination of the standard deviation of weighing balance., Readability 0.01 (mg)

Nominal test value (mg)	Standard Deviation
200000	0.004

Error of indication : from nominal value., Readability 0.01 (mg)

Nominal Value (mg)	Conventional Mass (mg)	Indication (mg)	Correction of Balance (mg)	Uncertainty (mg)	k
0	0.000	0.00	0.00	0.013	2.37
1	1.000	1.00	0.00	0.017	2.05
10	10.004	9.99	0.01	0.017	2.05
20	20.002	20.00	0.00	0.018	2.05
50	50.003	49.99	0.01	0.018	2.04
100	99.998	99.99	0.01	0.018	2.04
1000	999.995	1000.00	-0.01	0.021	2.00
50000	50000.012	50000.03	-0.02	0.070	2.00
100000	100000.039	100000.05	-0.01	0.11	2.00
150000	150000.051	150000.06	-0.01	0.18	2.00
200000	200000.010	200000.05	-0.04	0.21	2.00

Note: Weight of adjust - (mg)

The End of Certificate

Calibration Certificate

Part Number: 721A2601

Description: Micromate with DIN Geophone

Serial Number: UM17693

Calibration Date: NOV 24 2021

Calibration Reference Equipment: 714J7402

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____



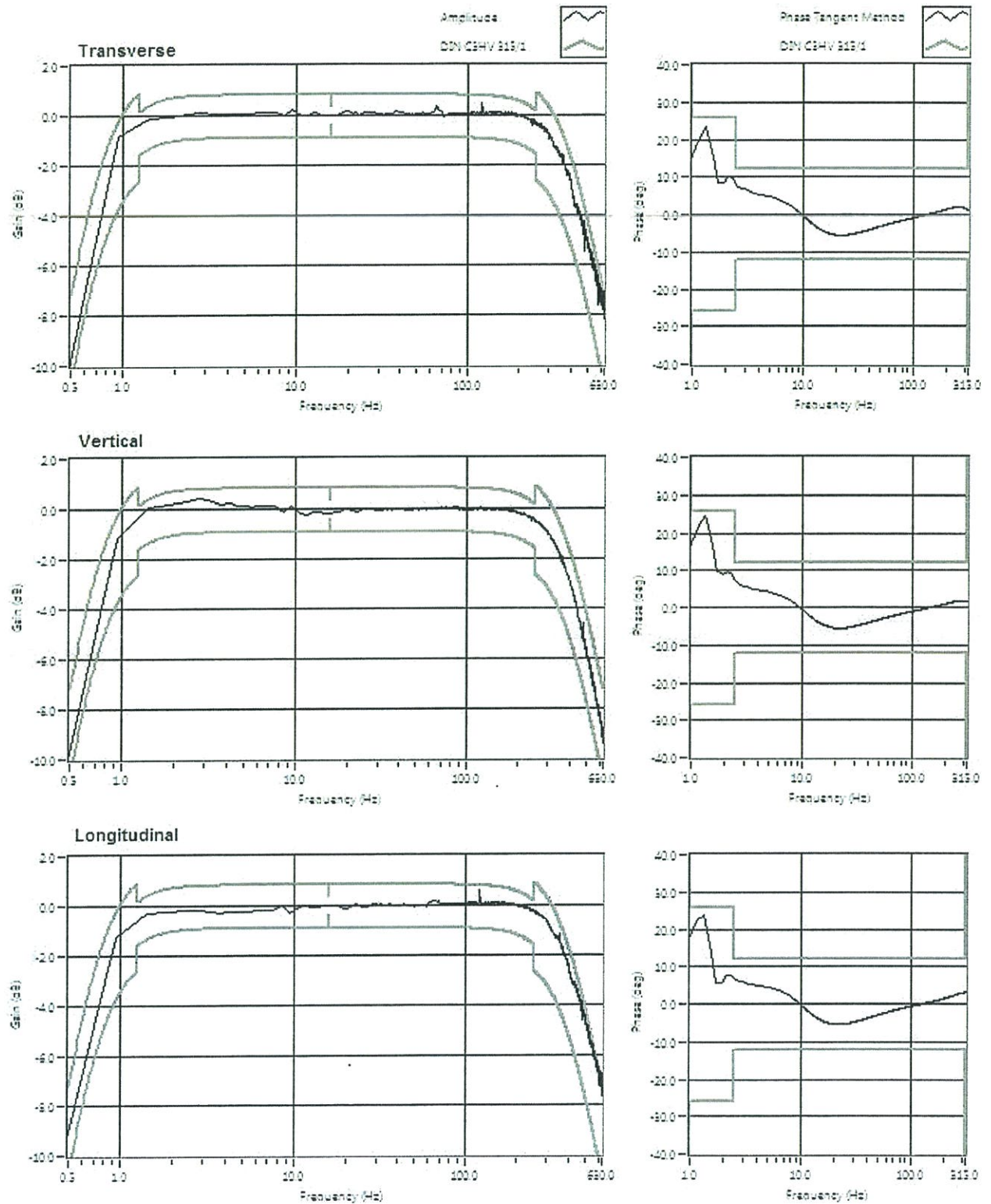
Xiaoming Yang



Instantel

309 Legget Drive, Ottawa, Ontario, K2K 3A3, (613) 592-4642

Frequency Response of UM17693



Calibration Certificate

Part Number: 721A2601

Description: Micromate with DIN Geophone

Serial Number: UM17694

Calibration Date: NOV 24 2021

Calibration Reference Equipment: 714J7402

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

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Calibrated By: _____

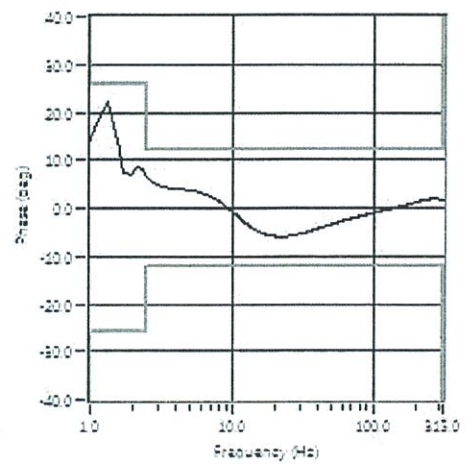
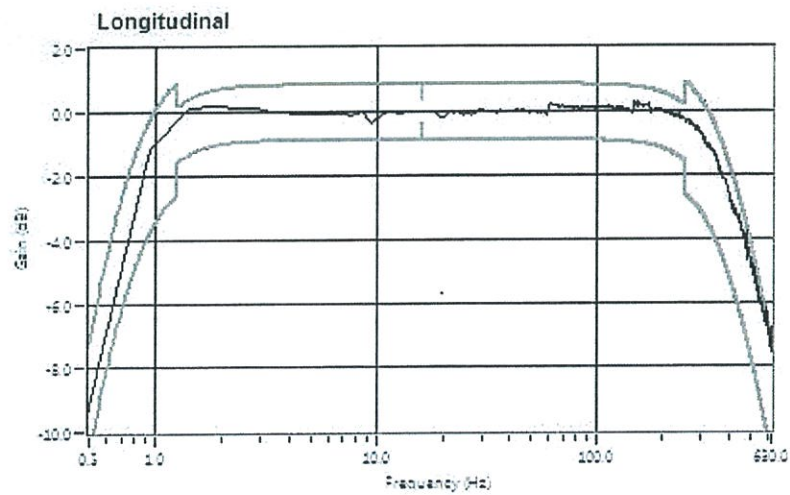
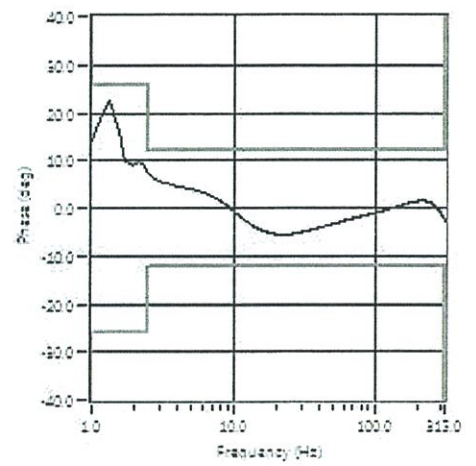
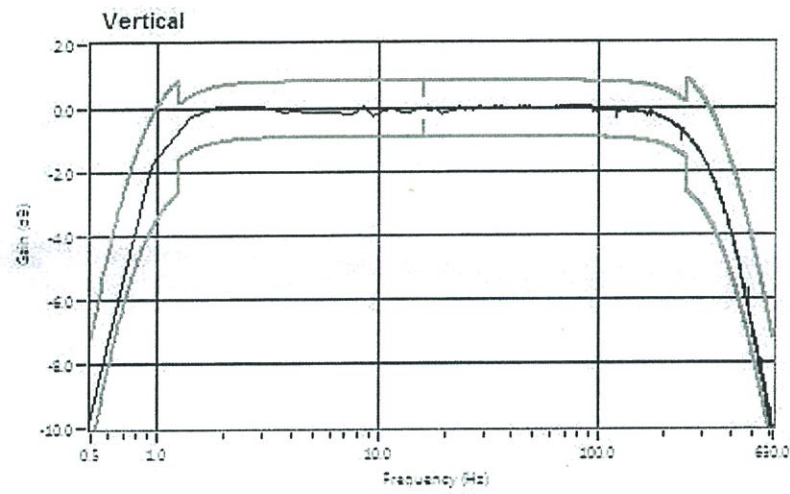
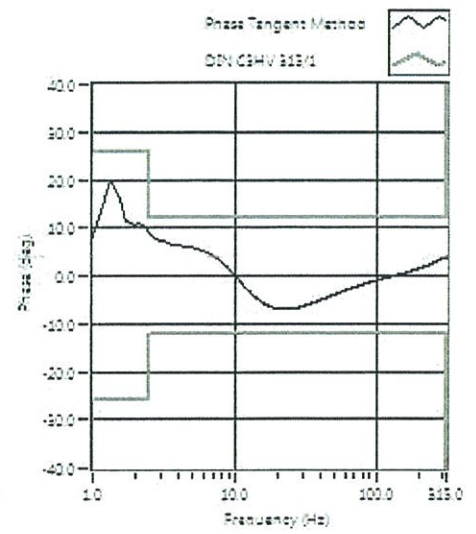
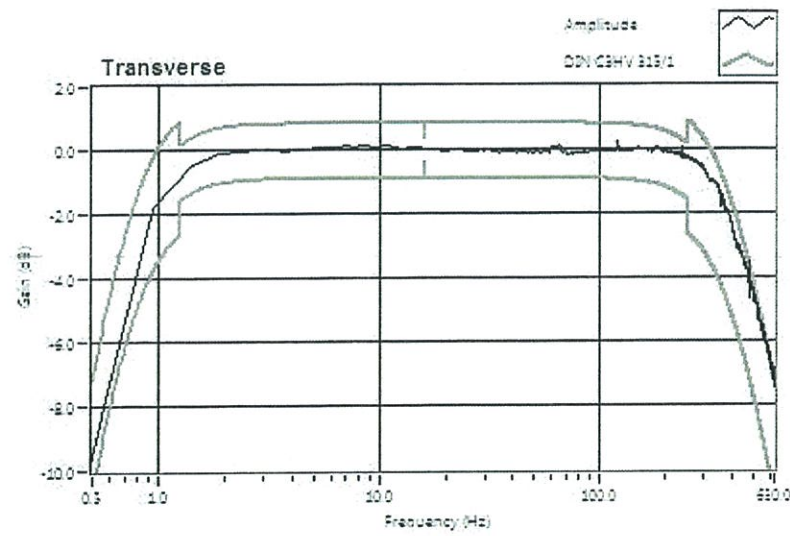
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Frequency Response of UM17694





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www.ecoconsult-lab.com Tax Identification Number : 0135559001081

Sound Level Meter Calibration Report

Equipment Type	:	Acoustic Calibrator
Manufacturer	:	ISO-TECH
Model	:	SLC-1356
Serial No.	:	030411025
Sound Output (dB(A))	:	94.0
Calibration date	:	October 5, 2022
Customer Name	:	Smart Environmental Consultants Co., Ltd.
Project Name	:	โครงการก่อสร้างอาคารพักอาศัยพร้อมสิ่งอำนวยความสะดวก ของสำนักงานปลัดกระทรวงกลาโหม (พื้นที่บางจาก (พื้นที่ 2)) โดยสำนักงานสนับสนุน สำนักงานปลัดกระทรวงกลาโหม

No.	Sound Level Meter	Serial Number	Actual Reading (dB(A))		Status
			Before	After	
1	ACO Model 6226	190060	93.8	94.0	Pass
2	ACO Model 6226	190058	93.4	94.0	Pass

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



(Ms. Phattaraporn Meepet)

Environmental Report Manager



Inctech Metrological Center Co.Ltd.

39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,

Saimai, Bangkok 10220, Thailand

Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com



Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate of Calibration

Certificate No. : ME21-2337

Page : 1 of 2

Customer : ECO Consultant Company Limited.
Address : 32/3-4, Moo.4, Toi Koh, Sam Kok, Pathumthani 12160

Description : Sound Level Meter
Manufacturer : ACO
Model : 6226
Serial No. : 190060
Identification No. : N/A
Calibration Place : Acoustical Laboratory

Order No. : 3296/21
Received date : Nov 23, 2021
Calibration date : Nov 25, 2021
Environment Condition :
Temperature : (23 +/- 3) °C
Humidity : (50 +/- 15) %RH

Calibration Method : Calibration were conducted using In-house calibration procedure CP-ME-004.
According to generate by Sound Level Calibrator.
The calibration methods based on IEC 60942 : 2017

Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
Sound Level Calibrator	336	080807177	EEL BP 60/1064	Oct 29, 2022

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

Traceability : This measurement are traceable to the International System of Unit (SI), through
National Institute of Metrology Thailand (NIMT)

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor
providing a level of confidence of not less than 95%



Calibrated by : Miss Kanyarat Sukjit
Issue date : Nov 25, 2021

Approved by :
(Mr.Suthichai Chanthipa)

This calibration certificate shall not be reproduced other than in full except with the prior written
approval of Inctech Metrological Center Co.,Ltd



Certificate No. : ME21-2337

Page : 2 of 2

Calibration Result : Without Adjustment
Function : Sound Level Measurement @ 1 kHz
Range : 20 dB to 100 dB
Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 100 dB	93.94	93.9	-0.04	0.6

Calibration Result : Without Adjustment
Function : Sound Level Measurement @ 1 kHz
Range : 20 dB to 110 dB
Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 110 dB	93.94	93.9	-0.04	0.6

Calibration Result : Without Adjustment
Function : Sound Level Measurement @ 1 kHz
Range : 30 dB to 120 dB
Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
30 dB ~ 130 dB	93.94	94.0	0.06	0.6
	113.94	113.8	-0.14	0.6

Calibration Result : Without Adjustment
Function : Sound Level Measurement @ 1 kHz
Range : 40 dB to 130 dB
Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
40 dB ~ 130 dB	93.94	94.0	0.06	0.6
	113.94	113.8	-0.14	0.6

UUC* = Unit Under Calibration



Inctech Metrological Center Co.Ltd.

39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,

Saimai, Bangkok 10220, Thailand

Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com



Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate of Calibration

Certificate No. : ME21-2336

Page : 1 of 2

Customer : ECO Consultant Company Limited.
Address : 32/3-4, Moo.4, Toi Koh, Sam Kok, Pathumthani 12160

Description : Sound Level Meter
Manufacturer : ACO
Model : 6226
Serial No. : 190058
Identification No. : N/A
Calibration Place : Acoustical Laboratory

Order No. : 3296/21
Received date : Nov 23, 2021
Calibration date : Nov 25, 2021
Environment Condition :
Temperature : (23 +/- 3) °C
Humidity : (50 +/- 15) %RH

Calibration Method : Calibration were conducted using In-house calibration procedure CP-ME-004.
According to generate by Sound Level Calibrator.
The calibration methods based on IEC 60942 : 2017

Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
Sound Level Calibrator	336	080807177	EEL BP 60/1064	Oct 29, 2022

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

Traceability : This measurement are traceable to the International System of Unit (SI), through
National Institute of Metrology Thailand (NIMT)

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor $k = 2$,
providing a level of confidence of not less than 95%



Calibrated by : Miss Kanyarat Sukjit
Issue date : Nov 25, 2021

Approved by :
(Mr.Suthichai Chanthipa)

This calibration certificate shall not be reproduced other than in full except with the prior written
approval of Inctech Metrological Center Co.,Ltd

**Inctech Metrological Center Co.Ltd.**

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Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate No. : ME21-2336

Page : 2 of 2

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 100 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 100 dB	93.94	93.9	-0.04	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 110 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 110 dB	93.94	94.0	0.06	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 30 dB to 120 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
30 dB ~ 130 dB	93.94	94.1	0.16	0.6
	113.94	113.9	-0.04	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 40 dB to 130 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
40 dB ~ 130 dB	93.94	94.0	0.06	0.6
	113.94	114.0	0.06	0.6

UUC* = Unit Under Calibration

ประจำเดือนพฤศจิกายน พ.ศ. 2565



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-157-038-9

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TSP High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 29, 2022
Sampler Location	บริเวณพื้นที่โครงการ	Sampler Number	TSP No.4	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

CONDITIONS

Actual Temperature (Ta) (deg C°)	30	Corrected Temperature (Ta) (deg K)	303
Actual pressure (Pa)(mm Hg)	758	Corrected pressure (Pa)(mm Hg)	758
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

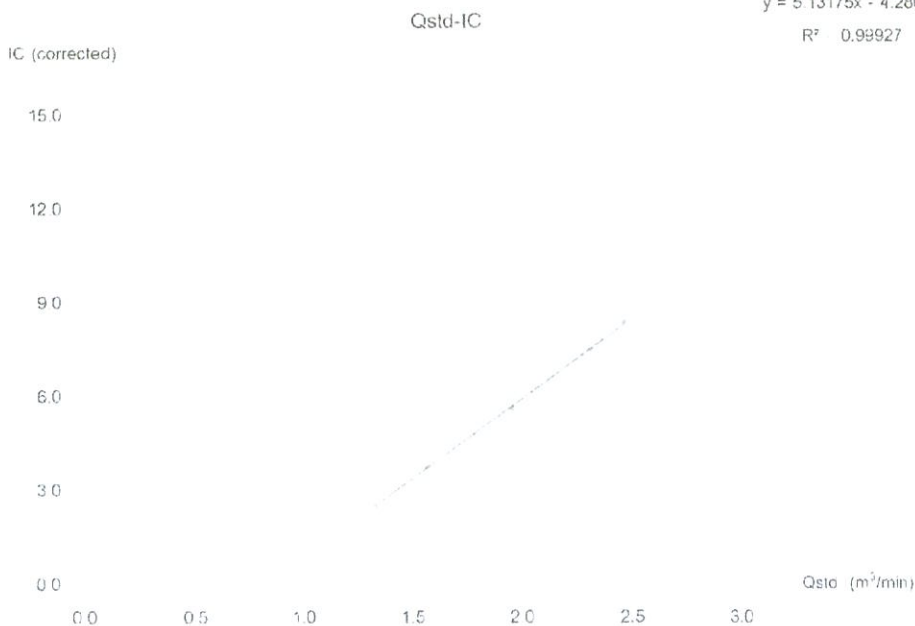
TEST

Plate No.	H ₂ O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	2.8	1.32834	2.60	2.58
7	3.9	1.56537	3.80	3.76
10	6.1	1.95448	5.70	5.65
13	8.5	2.30482	7.60	7.53
18	9.7	2.46126	8.50	8.42

LINEAR REGRESSION	
Slope	5.13175
Intercept	-4.28029
Corr. Coeff (r)	0.9996
# of Observation	5
Corr. Coeff (r ²)	0.99927

$$y = 5.13175x - 4.28029$$

$$R^2 = 0.99927$$



Test by :

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



Approved by :

(Ms. Phattaraporn Meepot)

Environmental Report Manager



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-157-038-9

32/3-4 หมู่ที่ 4 ตำบลท้ายเกาะ อำเภอสางโคก จังหวัดปทุมธานี 12160. โทร 02-157-038-9

www.ecoconsult-lab.com Tax Identification Number : 0135559001081

PM10 High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 29, 2022
Sampler Location	บริเวณพื้นที่โครงการ	Sampler Number	PM10 No.4	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

CONDITIONS

Actual Temperature (Ta) (deg C°)	30	Corrected Temperature (Ta) (deg K)	303
Actual pressure (Pa)(mm Hg)	758	Corrected pressure (Pa)(mm Hg)	758
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

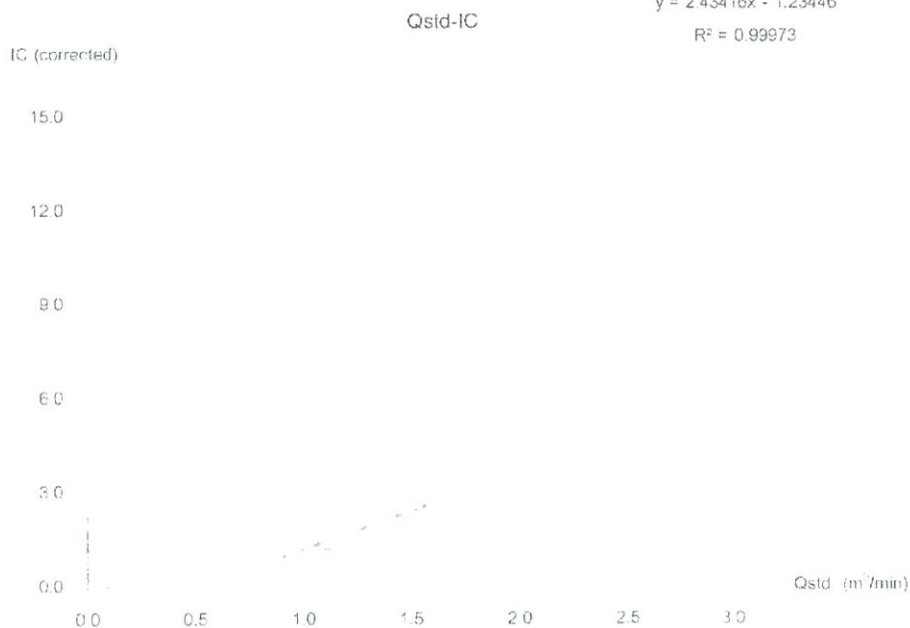
TEST

Plate No.	H ₂ O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	1.3	0.90922	1.00	0.99
7	1.8	1.06760	1.36	1.35
10	2.6	1.28049	1.90	1.88
13	3.3	1.44097	2.30	2.28
18	3.9	1.56537	2.60	2.58

LINEAR REGRESSION	
Slope	2.43416
Intercept	-1.23446
Corr. Coeff (r)	0.9999
# of Observation	5
Corr. Coeff (r ²)	0.99973

$$y = 2.43416x - 1.23446$$

$$R^2 = 0.99973$$



Test by :

Atirat P

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



Approved by :

Ms. Phattaraporn Meepet

(Ms. Phattaraporn Meepet)

Environmental Report Manager



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-001-384-5

32/3-4 หมู่ที่ 4 ตำบลท้ายเกาะ อำเภอสว่างโคก จังหวัดปทุมธานี 12160. โทร 02-001-384-5

www.ecoconsult-lab.com Tax Identification Number : 0135559001081

TSP High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 29, 2022
Sampler Location	ศูนย์บริการสาธารณะสุข 32	Sampler Number	TSP No.3	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

CONDITIONS

Actual Temperature (Ta) (deg C°)	29	Corrected Temperature (Ta) (deg K)	302
Actual pressure (Pa)(mm Hg)	758	Corrected pressure (Pa)(mm Hg)	758
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

TEST

Plate No.	H ₂ O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	2.8	1.32834	2.00	1.98
7	4.8	1.73521	3.20	3.18
10	7.1	2.10759	4.70	4.66
13	9.5	2.43589	5.90	5.85
18	11.8	2.71331	7.00	6.95

LINEAR REGRESSION	
Slope	3.62078
Intercept	-2.94866
Corr. Coeff (r)	0.9986
# of Observation	5
Corr. Coeff (r ²)	0.99711

$$y = 3.62078x - 2.94866$$

$$R^2 = 0.99711$$

IC (corrected)

Qstd-IC

15.0

12.0

9.0

6.0

3.0

0.0

0.0

0.5

1.0

1.5

2.0

2.5

3.0

Qstd (m³/min)

Test by

Atirat T.

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



Approved by

Ms. Phattaraporn Meepet

(Ms. Phattaraporn Meepet)

Environmental Report Manager



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-001-384-5

32/3-4 หมู่ที่ 4 ตำบลท้ายเกาะ อำเภอสสามโคก จังหวัดปทุมธานี 12160. โทร 02-001-384-5

www.ecoconsult-lab.com Tax Identification Number : 0135559001081

PM10 High Volume Sampler Calibration

Project Name	ก่อสร้างอาคารพักอาศัยปลัดกระทรวงกลาโหม	Location	กรุงเทพมหานคร	Date	October 29, 2022
Sampler Location	ศูนย์บริการสาธารณสุข 32	Sampler Number	PM10 No.3	Person	Mr. Nattawut Nontaruk

CALIBRATION ORIFICE

Date Certified	April 4, 2022	Make	Tisch Environmental, Inc	Intercept (b)	-0.0164
Calibration Model	TE-5025A	Calibrator Serial	3441	Slope (m)	1.27008

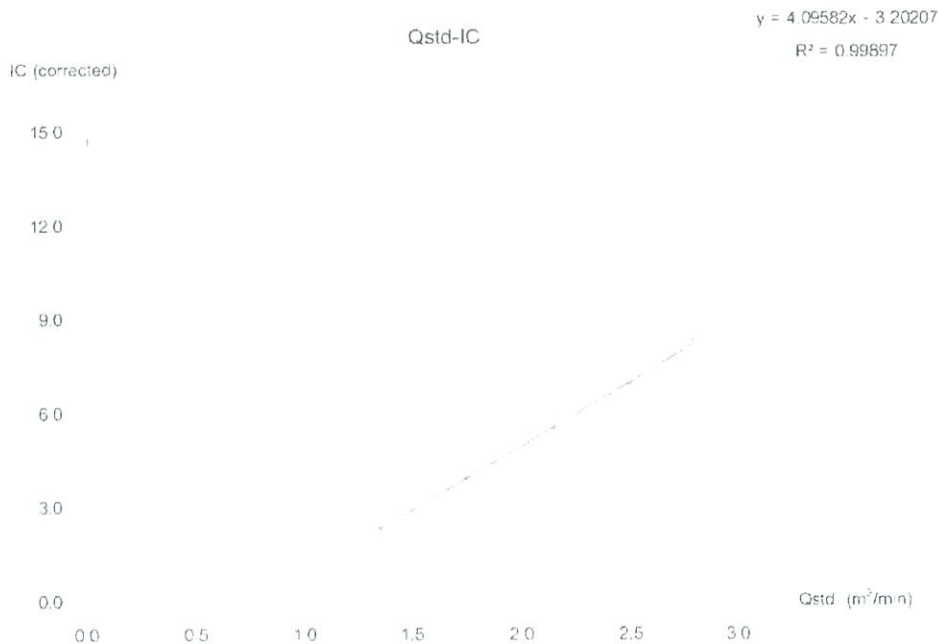
CONDITIONS

Actual Temperature (Ta) (deg C°)	29	Corrected Temperature (Ta) (deg K)	302
Actual pressure (Pa)(mm Hg)	758	Corrected pressure (Pa)(mm Hg)	758
Average Temp: (Deg K)	291	Temperature (Tstd)(deg K)	298.15
Corrected Average (mm Hg)	748.8	Pressure (Pstd)(mm Hg)	760

TEST

Plate No.	H ₂ O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)
5	2.9	1.35162	2.40	2.38
7	4.9	1.75306	4.00	3.97
10	7.4	2.15138	5.60	5.56
13	10.0	2.49883	7.00	6.95
18	12.5	2.79226	8.40	8.34

LINEAR REGRESSION	
Slope	4.09582
Intercept	-3.20207
Corr. Coeff (r)	0.9995
# of Observation	5
Corr. Coeff (r ²)	0.99897



Test by :

Atirat T

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



Approved by :

Ms. Phattaraporn Meepel

(Ms. Phattaraporn Meepel)

Environmental Report Manager



RECALIBRATION

DUE DATE:

April 4, 2023

Certificate of Calibration

Calibration Certification Information

Cal. Date: April 4, 2022 Rootsmeter S/N: 438320 Ta: 291 °K
 Operator: Jim Tisch Pa: 748.8 mm Hg
 Calibration Model #: TE-5025A Calibrator S/N: 3441

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4040	3.2	2.00
2	3	4	1	0.9980	6.4	4.00
3	5	6	1	0.8920	7.9	5.00
4	7	8	1	0.8510	8.8	5.50
5	9	10	1	0.7000	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0046	0.7156	1.4205	0.9957	0.7092	0.8816
1.0003	1.0023	2.0089	0.9915	0.9934	1.2468
0.9983	1.1192	2.2461	0.9894	1.1092	1.3940
0.9971	1.1717	2.3557	0.9882	1.1613	1.4620
0.9917	1.4167	2.8411	0.9829	1.4042	1.7632
QSTD	m=	2.02829	QA	m=	1.27008
	b=	-0.02643		b=	-0.01640
	r=	0.99995		r=	0.99995

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
Qstd=	Vstd/ΔTime	Qa=	Va/ΔTime
For subsequent flow rate calculations:			
Qstd= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$		Qa= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$	

Standard Conditions

Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter 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 B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



Certificate of Calibration



Certificate No.:	PTC/07/22285	Page:	1 of 2
Equipment:	Digital Balance	Condition:	Normal
Manufacturer:	Mettler Toledo	Serial No:	B405267423
Model:	XP205	ID No:	-
Type of Balance:	Single interval		

Customer: ECO CONSUL TANT CO.,LTD
32-3-4, Moo.4 Tai Koh,
Samkhon, Pathumthani 12160

Environment Condition: Temperature 22.3 °C ± 0.3 °C
Humidity 50.0 %RH ± 2.0 %RH
Air density 1.18 kg/m³

Calibration Place: ECO CONSUL TANT CO.,LTD (ห้างเครื่องชั่ง)
32-3-4, Moo.4 Tai Koh,
Samkhon, Pathumthani 12160

The Method used: In house method, PTC-WI-07, base on Euramet cg. 18


Traceability: This certificate is traceable to the SI Units through Thai Calibration Service Co.,Ltd.
, NSC-ONSC Accreditation No.: Calibration 0189


Date Received: September 20, 2022

Calibration Date: September 20, 2022

Issued Date: September 23, 2022

Calibration By: Mr. Keattisak Kerdto


(Mr.Kriangsak Kalasri)
Reviewed by


Approved By :
(Mr. Keattisak Kerdto)
Laboratory Manager

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 recognised national standard laboratories.

The measurement uncertainty stated is 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). The effect that the results relate only to the items calibrated.

This calibration certificate shall not be reproduced except in full only, without written approval from penta calibration co., ltd

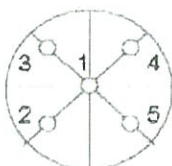
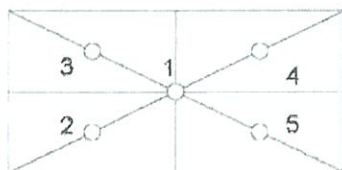


Measurement Results:

Without Adjustment :

Function Calibration: Internal Calibration

Eccentric Error: Weight to be 1/3 ,1/2 or of Maximum capacity



Eccentricity test 100000 (mg)

Position (mg)				
1	2	3	4	5
0.00	-0.01	0.00	0.01	-0.01
Maximum deviation:				0.01

Repeatability Test : Weight to be $1/2 \leq L_1 \leq$ Maximum capacity

Determination of the standard deviation of weighing balance., Readability 0.01 (mg)

Nominal test value (mg)	Standard Deviation
200000	0.004

Error of indication : from nominal value., Readability 0.01 (mg)

Nominal Value (mg)	Conventional Mass (mg)	Indication (mg)	Correction of Balance (mg)	Uncertainty (mg)	k
0	0.000	0.00	0.00	0.013	2.37
1	1.000	1.00	0.00	0.017	2.05
10	10.004	9.99	0.01	0.017	2.05
20	20.002	20.00	0.00	0.018	2.05
50	50.003	49.99	0.01	0.018	2.04
100	99.998	99.99	0.01	0.018	2.04
1000	999.995	1000.00	-0.01	0.021	2.00
50000	50000.012	50000.03	-0.02	0.070	2.00
100000	100000.039	100000.05	-0.01	0.11	2.00
150000	150000.051	150000.06	-0.01	0.18	2.00
200000	200000.010	200000.05	-0.04	0.21	2.00

Note: Weight of adjust - (mg)

The End of Certificate



ECO CONSULTANT COMPANY LIMITED.

32/3-4, Moo.4, Thai Ko, Sam Khok, Pathumthani, 12160. Tel. 02-001-384-5

32/3-4 หมู่ที่ 4 ตำบลท้ายเกาะ อำเภอสสามโคก จังหวัดปทุมธานี 12160. โทร 02-001-384-5

www.ecoconsult-lab.com Tax Identification Number : 0135559001081

Sound Level Meter Calibration Report

Equipment Type	:	Acoustic Calibrator
Manufacturer	:	ISO-TECH
Model	:	SLC-1356
Serial No.	:	030411025
Sound Output (dB(A))	:	93.9
Calibration date	:	October 28, 2022
Customer Name	:	Smart Environmental Consultants Co., Ltd.
Project Name	:	โครงการก่อสร้างอาคารพักอาศัยพร้อมสิ่งอำนวยความสะดวก ของสำนักงานปลัดกระทรวงกลาโหม (พื้นที่บางจาก (พื้นที่ 2)) โดยสำนักงานสนับสนุน สำนักงานปลัดกระทรวงกลาโหม

No.	Sound Level Meter	Serial Number	Actual Reading (dB(A))		Status
			Before	After	
1	ACO Model 6226	170119	93.8	93.9	Pass
2	ACO Model 6226	190076	93.4	93.9	Pass

(Mr. Atirat Thaipradit)

Environmental Monitoring Manager



(Ms. Phattaraporn Meepet)

Environmental Report Manager



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-65/0763

MTC No. EEL. BP. 29/0965

CALIBRATION CERTIFICATE

Submitted by : Eco Consultant Company Limited.

Address : 32/3-4 Moo 4, Tai Koh, Sam Kok, Pathumthani, 12160.

Calibrated at : Electrical and Electronic Standards Laboratory, Industrial Metrology and Testing Service Centre.
: Soi 1C, Bangpoo Industrial Estate, Sukhumvit Rd., Muang, Samutprakan 10280.

Instrument Calibrated :

Description : Sound Level Calibrator

Manufacturer : ISO-TECH

Model : SLC-1356

Serial No. : 030411025

Ambient Environment

Temperature : $(23 \pm 3) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \%$

Ambient Pressure : $(101.325 \pm 1.500) \text{ kPa}$

Standards used : 1. Digital Function Synthesizer NF Electronic DF-193A S/N 122037.

2. Measuring Amplifier Bruel&Kjaer 2636 S/N 1537484.

3. Programmable Attenuator Tamagawa TPA-303A S/N OF 2214.

4. Digital Multimeter Agilent 34401A S/N MY44005560.

5. Pressure Transmitter Vaisala PTB202AD S/N T0650001.

6. Audio Analyzer Panasonic VP-7722A S/N 041477D122.

7. Condenser Microphone Bruel&Kjaer 4180 S/N 2633526.

Calibration Procedure: CP-102-04 based on IEC 60942-2003. The sound pressure level of instrument was measured by standard microphone using an insert voltage technique.

This instrument has been calibrated against standards maintained at Electrical and Electronic Standards Laboratory (EEL), which are traceable to the International System of Units through the National Institute of Metrology (Thailand).

The information on actual reading is attached herewith and the uncertainty limits quoted refer to the measured values only

Date of Receipt : 14 Sep. 2022

Date of Calibration : 20 Sep. 2022

1 / 3

N. N. K. P.

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

Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the governor of TISTR.

FM.BL.MTC.002 Rev.4

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E-mail : rumpai@tistr.or.th Website:www.tistr.or.th

Office/Laboratory

Soi 1C, Bangpoo Industrial Estate, Sukhumvit Road,
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Fax. (66) 0 2323 9165
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Fax. (66) 0 2579 8592
E-mail : sumalee@tistr.or.th



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-65/0763

MTC No. EEL. BP. 29/0965

The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

Nominal Output of Unit Under Test = 94 dB re 20 μ Pa at 1000 Hz**Acoustic Output in dB re 20 μ Pa, Corrected to Reference Conditions: 101.325 kPa, 23.0 °C and 50 %RH.****1. Sound Pressure Level**

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer4180	93.86	-0.14	± 0.10	± 0.75 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer4180	999.9	-0.1	± 1.5	± 2.0 %

3. Total distortion

Standard Microphone Type	Measured Total distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer4180	1.36	± 0.50	± 4.0 %

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was not included.

Date of Calibration : 20 Sep. 2022

2 / 3

N. K. P. 20/9/22

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FM.BL.MTC.002 Rev.4

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



THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Request No. 21-65/0763

MTC No. EEL. BP. 29/0965

Nominal Output of Unit Under Test = 114 dB re 20 μ Pa at 1000 Hz

Acoustic Output in dB re 20 μ Pa, Corrected to Reference Conditions : 101.325 kPa, 23.0 °C and 50 %RH

1. Sound Pressure Level

Standard Microphone Type	Measured Sound Pressure Level (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer 4180	113.71	-0.29	± 0.10	± 0.75 dB

2. Frequency

Standard Microphone Type	Measured Frequency (Hz)	Deviated value (Hz)	Uncertainty (Hz)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer 4180	997.9	-2.1	± 1.5	± 2.0 %

3. Total Distortion


Standard Microphone Type	Measured Total Distortion (%)	Uncertainty (%)	Tolerance limit IEC60942:2003 Class 2
1/2 inch Bruel&Kjaer 4180	2.85	± 0.50	± 4.0 %

Note : 1. No adjustment.

2. The calibrator pressure correction was not included.

3. The microphone volume correction was not included.

Calibrated by :


(Mr. Nuttapong Niljrusvanit)

Approved by :


Director

Electrical and Electronic Standards Laboratory

Industrial Metrology and Testing Service Centre

Date of Calibration : 20 Sep. 2022

Date of Issue : 21 Sep. 2022

Ref : 2011265091404056001

3 / 3

End of Certificate

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

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FM.BL.MTC.002 Rev.4

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E-mail : sumalee@tistr.or.th



Inctech Metrological Center Co.Ltd.
39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,
Saimai, Bangkok 10220, Thailand
Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com



Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate of Calibration

Certificate No. : ME21-2334

Page : 1 of 2

Customer : ECO Consultant Company Limited.
Address : 32/3-4, Moo.4, Toi Koh, Sam Kok, Pathumthani 12160

Description : Sound Level Meter
Manufacturer : ACO
Model : 6226
Serial No. : 170119
Identification No. : N/A
Calibration Place : Acoustical Laboratory

Order No. : 3296/21
Received date : Nov 23, 2021
Calibration date : Nov 25, 2021
Environment Condition :
Temperature : (23 +/- 3) °C
Humidity : (50 +/- 15) %RH

Calibration Method : Calibration were conducted using In-house calibration procedure CP-ME-004
According to generate by Sound Level Calibrator.
The calibration methods based on IEC 60942 : 2017

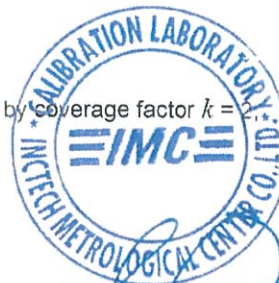
Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
Sound Level Calibrator	336	080807177	EEL BP 60/1064	Oct 29, 2022

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

Traceability : This measurement are traceable to the International System of Unit (SI), through
National Institute of Metrology Thailand (NIMT)

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor $k =$
providing a level of confidence of not less than 95%



Calibrated by : Miss Kanyarat Sukjit
Issue date : Nov 25, 2021

Approved by :
(Mr.Suthichai Chanthipa)

This calibration certificate shall not be reproduced other than in full except with the prior written
approval of Inctech Metrological Center Co.,Ltd

**Intech Metrological Center Co.Ltd.**39/1 Soi 82, Sukhaphiban 5 Rd., O ngoen,
Saimai, Bangkok 10220, ThailandTel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.comCalibration Cert. # 3884.01
ISO/IEC 17025

Certificate No. : ME21-2334

Page : 2 of 2

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 100 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 100 dB	93.94	94.2	0.26	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 110 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 110 dB	93.94	94.2	0.26	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 30 dB to 120 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
30 dB ~ 130 dB	93.94	94.4	0.46	0.6
	113.94	114.2	0.26	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 40 dB to 130 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
40 dB ~ 130 dB	93.94	94.2	0.26	0.6
	113.94	114.2	0.26	0.6

UUC* = Unit Under Calibration

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Calibration Cert. # 3884.01
ISO/IEC 17025

Certificate of Calibration

Certificate No. : ME21-2338

Page : 1 of 2

Customer : ECO Consultant Company Limited.
Address : 32/3-4, Moo.4, Toi Koh, Sam Kok, Pathumthani 12160

Description : Sound Level Meter
Manufacturer : ACO
Model : 6226
Serial No. : 190076
Identification No. : N/A
Calibration Place : Acoustical Laboratory

Order No. : 3296/21
Received date : Nov 23, 2021
Calibration date : Nov 25, 2021
Environment Condition :
Temperature : (23 +/- 3) °C
Humidity : (50 +/- 15) %RH

Calibration Method : Calibration were conducted using In-house calibration procedure CP-ME-004.
According to generate by Sound Level Calibrator.
The calibration methods based on IEC 60942 : 2017

Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
Sound Level Calibrator	336	080807177	EEL BP 60/1064	Oct 29, 2022

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

Traceability : This measurement are traceable to the International System of Unit (SI), through
National Institute of Metrology Thailand (NIMT)

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor $k=2$,
providing a level of confidence of not less than 95%



Calibrated by : Miss Kanyarat Sukjit
Issue date : Nov 25, 2021

Approved by
(Mr.Suthichai Chanthipa)

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Calibration Cert. # 3884.01
 ISO/IEC 17025

Certificate No. : ME21-2338

Page : 2 of 2

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 100 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 100 dB	93.94	93.9	-0.04	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 20 dB to 110 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
20 dB ~ 110 dB	93.94	93.9	-0.04	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 30 dB to 120 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
30 dB ~ 130 dB	93.94	94.0	0.06	0.6
	113.94	113.7	-0.24	0.6

Calibration Result : Without Adjustment
 Function : Sound Level Measurement @ 1 kHz
 Range : 40 dB to 130 dB
 Resolution : 0.1 dB

Range of UUC*	Standard Value (dB)	UUC* Reading (dB)	UUC* Error (dB)	Uncertainty of Measurement (+/- dB)
40 dB ~ 130 dB	93.94	93.9	-0.04	0.6
	113.94	113.7	-0.24	0.6

UUC* = Unit Under Calibration

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