



AMCEN LAB SDN BHD ^{1070971-W}
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AIR EMISSION MONITORING REPORT



ELNA PCB (M) SDN BHD

Plot 558, Lorong Perusahaan 4,
Free Trade Zone, 13600, Prai Industrial Estate,
Penang, Malaysia

Date of Monitoring: 12th June 2024

Report No.: AE/24/138N

Beyond Testing, Deliver Solution

(HQ) No.18, Lorong Talang 9, 13600 Prai, Penang.
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STACK AIR EMISSION MONITORING

EXECUTIVE SUMMARY

Air Emission Monitoring was conducted successfully in **ELNA PCB (M) SDN BHD** on 12th June 2024.

The monitoring was conducted in accordance with ELNA PCB (M) SDN BHD commitment to the implementation of environmentally friendly operation. The monitoring took place in *Scrubber 1 (Chimney 2), Scrubber 2 (Chimney 3), Scrubber 3 (Chimney 12), Scrubber 4 (Chimney 14), Chimney 5, Chimney 15: Bag filter, and Chimney 16: Bag filter.*

A total of 24 samples were collected and the monitoring parameter were *Carbon Tetrachloride, Methyl Bromide and Methyl Chloroform*. The monitored parameters were found to be **BELOW** the limit values as required by the *Environmental Quality (Clean Air) Regulations 2014*.

Conclusively, the control measure implemented in ELNA PCB (M) SDN BHD are well adequate to control emitted contaminants. It should be noted that the performance of the stack may deteriorate in future if lack of maintenance on the system.

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STACK AIR EMISSION MONITORING

1. INTRODUCTION

Amcen Lab Sdn Bhd was appointed to carry out Air Emission Monitoring at its factory located at:

ELNA PCB (M) SDN BHD
Plot 558, Lorong Perusahaan 4,
Free Trade Zone, 13600, Prai Industrial Estate,
Penang, Malaysia

The air emission monitoring was carried out to comply with *Environmental Quality (Clean Air) Regulation 2014*, for *Scrubber 1 (Chimney 2)*, *Scrubber 2 (Chimney 3)*, *Scrubber 3 (Chimney 12)*, *Scrubber 4 (Chimney 14)*, *Chimney 5*, *Chimney 15: Bag filter*, and *Chimney 16: Bag filter*. The monitoring was performed by Mr. Boo Wei Ping and assisted Mr. Akmal Haziq on 12th June 2024.

2. OBJECTIVES

The objectives of the study include the following:

- i. To conduct on-site air emission monitoring for Scrubber 1 (Chimney 2), Scrubber 2 (Chimney 3), Scrubber 3 (Chimney 12), Scrubber 4 (Chimney 14), Chimney 5, Chimney 15: Bag filter, and Chimney 16: Bag filter.*
- ii. To determine the air emission impurities level Scrubber 1 (Chimney 2), Scrubber 2 (Chimney 3), Scrubber 3 (Chimney 12), Scrubber 4 (Chimney 14), Chimney 5, Chimney 15: Bag filter, and Chimney 16: Bag filter compliance with Environmental Quality (Clean Air) Regulation 2014.*

STACK AIR EMISSION MONITORING

3. METHODOLOGY

3.1 Sampling Method

3.1.1 Non-Isokinetic Sampling Method

The sampling was performed by using Gillian Sampling Pump. The collected samples were analyzed by Amcen Lab Sdn Bhd a testing laboratory accredited by the Department of Standard Malaysia under the SAMM MS ISO/IEC 17025 (SAMM 730). The monitoring parameter and analytical methods used are shown in table 2 below.

Table 2: Monitoring Parameter and Analytical Methods (Non-Isokinetic)

Parameter	Sampling Flow Rate [Liter / min]	Sampling Media	Analytical Method
Carbon Tetrachloride	0.2	SOLID SORBENT TUBE (coconut shell charcoal, 100 mg/50 mg)	NIOSH 1003
Methyl Chloroform			
Methyl Bromide	0.1	SOLID SORBENT TUBE (coconut shell charcoal, 400 mg/200 mg)	NIOSH 2520

3.1.2 Sampling Procedure for Non-Isokinetic Method

- i. The sampling train was set by connecting a Sampling media to a calibrated sampling pump. The sampling pump was set as per state in NIOSH sampling method guideline. The contaminant was drawn from the source through a sampling probe.
- ii. Switch on the calibrated sampling pump and start the sampling. Record the start time. Contaminant was withdrawn from the source and collected in sampling media. Temperature was also recorded.
- iii. During the sampling period, the flow meter float was checked periodically to ensure the flow is constant. If the meter could not be adjusted to correct a problem, the sampling is considered terminated.
- iv. At the end of the sampling, the sampling pump was switched off and the stop time was recorded.
- v. The sampling probe was removed from the sampling point.
- vi. The collected sample was labeled. Both inlet and outlet of the media were capped and send for laboratory testing.
- vii. The sampling pump was calibrated again after monitoring was completed.

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4. MONITORING RESULTS AND DISCUSSION

4.1.1 Scrubber 1 (Chimney 2)

Table 3: Air Emission Monitoring Results for Scrubber 1 (Chimney 2)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

4.1.2 Scrubber 2 (Chimney 3)

Table 4: Air Emission Monitoring Results for Scrubber 2 (Chimney 3)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

4.1.3 Scrubber 3 (Chimney 12)

Table 5: Air Emission Monitoring Results for Scrubber 3 (Chimney 12)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

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4.1.4 Scrubber 4 (Chimney 14)

Table 6: Air Emission Monitoring Results for Scrubber 4 (Chimney 14)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

4.1.5 Chimney 5

Table 7: Air Emission Monitoring Results for Chimney 5

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

4.1.6 Chimney 6 (R&D) lab

Table 8: Air Emission Monitoring Results for Chimney 6 (R&D) lab

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

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4.1.7 Chimney 15 (Bag filter)

Table 9: Air Emission Monitoring Results for Chimney 15 (Bag filter)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014

4.1.8 Chimney 16 (Bag filter)

Table 10: Air Emission Monitoring Results for Chimney 16 (Bag filter)

Parameter	Result (mg/m ³)	Limit (mg/m ³)	Standard	Remarks
Carbon Tetrachloride	ND (<1.667)	20	[Regulation 15] Category 3, Class 1	Complied
Methyl Chloroform	ND (<1.667)			Complied
Methyl Bromide	ND (<3.333)	5	[Regulation 15] Category 2, Class 3	Complied

Note:

ND = Not detected

< (numeric value) =denotes detection limit

Limits refer=Environmental Quality (Clean air) Regulation 2014


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5. CONCLUSION

The stack air emission monitoring was carried out successfully on 12th June 2024. The objectives were achieved.

A total of 24 samples were collected and the monitoring parameter were *Carbon Tetrachloride, Methyl Bromide and Methyl Chloroform*. The monitored parameters were found to be **BELOW** the limit values as required by the *Environmental Quality (Clean Air) Regulations 2014*.

Prepared By	 ChM. Boo Wei Ping Laboratory Manager IKM No.: M/5572/7052/15/20 Amcen Lab Sdn Bhd No.18, Lorong Talang 9, 13600 Perai, Penang.
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APPENDIX I
Certificate of Analysis



CERTIFICATE OF ANALYSIS

ELNA PCB (M) SDN BHD
 Plot 558, Lorong Perusahaan 4,
 Free Trade Zone,
 13600, Prai Industrial Estate,
 Penang, Malaysia
 Tel: 04-397 3934
 Fax: 04-397 3932
 Attention:

Certificate No	: AMC/nA2406/0223
Sample Log Code	: nA2406/0222
Sample Received Date	: 13-Jun-2024
Issuance Date	: 20-Jun-2024

Sample Description : Air Emission Monitoring
 Sample Information : Location: Scrubber 1
 Name: Chimney 2
 Sampling Date: 12.06.2024
 Sampling Media: Small Charcoal Tube (100/50), 2 Big Charcoal Tube (400/200)
 Analysis Results :

Parameter	Standard Method	Unit	Analysis Result
Carbon Tetrachloride	In house method based on NIOSH 1003	mg/unit	ND(<0.01)
Methyl bromide	In house method based on NIOSH 2520	mg/unit	ND(<0.01)
Methyl Chloroform	In house method based on NIOSH 1003	mg/unit	ND(<0.01)

ND denotes not detected

Remark :

ChM. Yeow Liang Ming
 General Manager
 B.Sc., M.Sc., M.B.A.
 M1737/4047/00

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APPENDIX II

Example of Calculation Datasheet

Sampling Location: Scrubber 1 (chimney 2)	Sampling Personnel: N/A
Environmental Condition: 28.5	
Parameter: Carbon Tetrachloride	Date of Sampling: 12 th June 2024
Sampling Method: NIOSH 1003	
Pump ID: ICS/17/00004	Calibrator Equipment ID: ICS/17/0011
Time Start: 9:30 AM	Time Stop: 10:00 AM
Duration, t (minutes): 30 Minutes	Number of Blank: 1
Location Temperature, T (K): 310	Initial Calibration (L/min): 0.200
Calibration Temperature, T _c (K): 298	Final Calibration (L/min): 0.200
Media Label: 1.1	Flow Rate, f _c (L/min): 0.200
Sampling Media: Small Charcoal (100/50) mg	
Analysis Result (mg): <i>ND</i> (< 0.01)	

Remarks:

- At normal condition, $P_{\text{calibration}} = P_{\text{sampling}} = P_{\text{standard}}$
- The correction is necessary if there is a difference altitude of more than 1,000 feet (330m) or more than 14°C

$V = \frac{[f_c] \text{L/min} \times [t] \text{min}}{1000}$ $\times \frac{[P_c \times T]^{1/2} \text{K}}{[P_s \times T_c]^{1/2} \text{K}}$ $= [V] \text{m}^3$ $V_s = V \times \frac{P}{760} \times \frac{298 \text{K}}{[T] \text{K}}$ $= [V_s] \text{m}^3$ $\therefore C = \frac{[\text{Sample Weight}] \text{mg}}{[V_s] \text{m}^3}$ $= [C] \text{mg/m}^3$	$V = \frac{[0.200] \text{L/min} \times [30] \text{min}}{1000} \times \frac{[310]^{1/2} \text{K}}{[298]^{1/2} \text{K}}$ $= [0.006] \text{m}^3$ $V_s = V \times \frac{298 \text{K}}{[T] \text{K}}$ $= [0.006] \text{m}^3$ $\therefore C = \frac{[ND (< 0.01)] \text{mg}}{[0.006] \text{m}^3}$ $= [ND (< 1.667)] \text{mg/m}^3$
---	---

Where,

- fc = Calibrated flow rate (L/min)
t = Sample Duration (mins)
Pc = Barometric pressure at calibration location (mmHg)
Ps = Barometric pressure at sampling location (mmHg)
T = Absolute average ambient air temperature during sampling (Kelvin)
Tc = Absolute ambient temperature during calibration (Kelvin)
Vs = Volume of air sampled at standard condition (m³)
V = Actual volume of air sampled (m³)
P = Volumetric pressure at sampling location (mmHg)

Sampling Location: Scrubber 1 (chimney 2)	Sampling Personnel: N/A
Environmental Condition: 28.5	
Parameter: Methyl bromide	Date of Sampling: 12 th June 2024
Sampling Method: NIOSH 2520	
Pump ID: ICS/17/00004	Calibrator Equipment ID: ICS/17/0011
Time Start: 9:30 AM	Time Stop: 10:00 AM
Duration, t (minutes): 30 Minutes	Number of Blank: 1
Location Temperature, T (K): 310	Initial Calibration (L/min): 0.100
Calibration Temperature, T _c (K): 298	Final Calibration (L/min): 0.100
Media Label: 1.2	Flow Rate, f _c (L/min): 0.100
Sampling Media: 2 Big Charcoal (400/200) mg	
Analysis Result (mg): <i>ND</i> (< 0.01)	

Remarks:

- At normal condition, $P_{\text{calibration}} = P_{\text{sampling}} = P_{\text{standard}}$
- The correction is necessary if there is a difference altitude of more than 1,000 feet (330m) or more than 14°C

$V = \frac{[f_c] \text{L/min} \times [t] \text{min}}{1000}$ $\times \frac{[P_c \times T]^{1/2} \text{K}}{[P_s \times T_c]^{1/2} \text{K}}$ $= [V] \text{m}^3$ $V_s = V \times \frac{P}{760} \times \frac{298 \text{K}}{[T] \text{K}}$ $= [V_s] \text{m}^3$ $\therefore C = \frac{[\text{Sample Weight}] \text{mg}}{[V_s] \text{m}^3}$ $= [C] \text{mg/m}^3$	$V = \frac{[0.200] \text{L/min} \times [30] \text{min}}{1000} \times \frac{[310]^{1/2} \text{K}}{[298]^{1/2} \text{K}}$ $= [0.003] \text{m}^3$ $V_s = V \times \frac{298 \text{K}}{[T] \text{K}}$ $= [0.003] \text{m}^3$ $\therefore C = \frac{[ND (< 0.01)] \text{mg}}{[0.003] \text{m}^3}$ $= [ND (< 3.333)] \text{mg/m}^3$
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Where,

- fc = Calibrated flow rate (L/min)
t = Sample Duration (mins)
Pc = Barometric pressure at calibration location (mmHg)
Ps = Barometric pressure at sampling location (mmHg)
T = Absolute average ambient air temperature during sampling (Kelvin)
Tc = Absolute ambient temperature during calibration (Kelvin)
Vs = Volume of air sampled at standard condition (m³)
V = Actual volume of air sampled (m³)
P = Volumetric pressure at sampling location (mmHg)

Sampling Location: Scrubber 1 (chimney 2)	Sampling Personnel: N/A
Environmental Condition: 28.5	
Parameter: Methyl Chloroform	Date of Sampling: 12 th June 2024
Sampling Method: NIOSH 1003	
Pump ID: ICS/17/00004	Calibrator Equipment ID: ICS/17/0011
Time Start: 9:30 AM	Time Stop: 10:00 AM
Duration, t (minutes): 30 Minutes	Number of Blank: 1
Location Temperature, T (K): 310	Initial Calibration (L/min): 0.200
Calibration Temperature, T _c (K): 298	Final Calibration (L/min): 0.200
Media Label: 1.3	Flow Rate, f _c (L/min): 0.200
Sampling Media: Small Charcoal (100/50) mg	
Analysis Result (mg): <i>ND</i> (< 0.01)	

Remarks:

- At normal condition, $P_{\text{calibration}} = P_{\text{sampling}} = P_{\text{standard}}$
- The correction is necessary if there is a difference altitude of more than 1,000 feet (330m) or more than 14°C

$V = \frac{[f_c] \text{ L/min} \times [t] \text{ min}}{1000} \times \frac{[P_c \times T]^{1/2} \text{ K}}{[P_s \times T_c]^{1/2} \text{ K}}$ $= [V] \text{ m}^3$ $V_s = V \times \frac{P}{760} \times \frac{298 \text{ K}}{[T] \text{ K}}$ $= [V_s] \text{ m}^3$ $\therefore C = \frac{[\text{Sample Weight}] \text{ mg}}{[V_s] \text{ m}^3}$ $= [C] \text{ mg/m}^3$	$V = \frac{[0.200] \text{ L/min} \times [30] \text{ min}}{1000} \times \frac{[310]^{1/2} \text{ K}}{[298]^{1/2} \text{ K}}$ $= [0.006] \text{ m}^3$ $V_s = V \times \frac{298 \text{ K}}{[T] \text{ K}}$ $= [0.006] \text{ m}^3$ $\therefore C = \frac{[ND (< 0.01)] \text{ mg}}{[0.006] \text{ m}^3}$ $= [ND (< 1.667)] \text{ mg/m}^3$
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Where,

- fc = Calibrated flow rate (L/min)
t = Sample Duration (mins)
Pc = Barometric pressure at calibration location (mmHg)
Ps = Barometric pressure at sampling location (mmHg)
T = Absolute average ambient air temperature during sampling (Kelvin)
Tc = Absolute ambient temperature during calibration (Kelvin)
Vs = Volume of air sampled at standard condition (m³)
V = Actual volume of air sampled (m³)
P = Volumetric pressure at sampling location (mmHg)

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APPENDIX III

Photo of Chimneys



Scrubber 1 (Chimney 2)



Scrubber 2 (Chimney 3)



Scrubber 3 (Chimney 12)



Scrubber 4 (Chimney 14)



Chimney 5



Chimney 15 (Bag filter)



Chimney 6 (R&D lab)



Chimney 16

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APPENDIX IV
Certificate of Calibration



**CALIBRATION REPORT FOR
FLOW METERING IN GASEOUS SAMPLING MODE OF
STACK MONITORING SYSTEM**

REPORT NO. : POLLTECH / F / SMS/ 01-19 / 188

Name of the Party : M/s. Technovation Enterprises, Malaysia
Make, Model No. & Sr. No. : Polltech make, Model PEM-SMS4, Sr. No. 0818
Operating Conditions : **Barometric Pressure** : 1012.8 mBar;
: **Ambient Temperature** : 28.23°C; **R.H** : 40%
Gaseous Flow Constant (Entered) : 1.130
Date of Calibration : 03/01/2024
Next Calibration Due : 03/01/2025

Flow Value indicated on certified Flow Calibrator (TPM)	Flow Value indicated on Stack Monitoring System (LPM)	Error % of reading
0.981	0.98	-0.0

Remark : The Indicated Flow Value is matching about $\pm 1\%$ of Flow Value indicated on Flow Calibrator.

Test Apparatus Used : Certified Air Flow Calibration Model PSI-AFC1, Sr. No. 0A11 with Certificate No. PICAL/0218/F/001 valid up to 09/12/2024

Calibrated by

(K.K. Gogari)

Checked by

(Dr. P.K. Arora)



**CALIBRATION REPORT FOR
FLOW METERING IN PARTICULATE / MOISTURE SAMPLING MODE OF
STACK MONITORING SYSTEM**

REPORT NO. : POLLTECH / F / SMS/ 01-19 / 189

Name of the Party : M/s. Technovation Enterprises, Malaysia
Make, Model No. & Sr. No. : Polltech make, Model PEM-SMS4, Sr. No. 0818
Full Scale Range : 60 LPM
Operating Conditions : **Barometric Pressure** : 1012.8 mBar;
: **Ambient Temperature** : 25.18°C; **R.H** : 40%
Orifice Constant (Entered) : 2.50
Date of Calibration : 03/01/2024
Next Calibration Due : 03/01/2025

Flow Value indicated on certified Flow Calibrator (LPM)	Flow Value Indicated on Stack Monitoring System (LPM)	%Error of F. S.
9.10	9.3	+0.2
21.8	20.6	-1.2
30.9	30.1	-0.8
40.7	40.6	-0.1
48.8	49.2	+0.4
56.5	57.0	+0.5

Remark : The error in **Flow Metering in Particulate / moisture mode Sampling** has been found to be about $\pm 2\%$ over the Flow Range from 10 to 60 LPM.

Test Apparatus Used : **Certified Orifice Flow Calibrator Model PSI-OFC2, Sr. No. 0A11** with Certificate No. **PICAL/0218/F/002** valid upto **09/12/2024**

Calibrated by

(K.K. Gogari)

Checked by

(Dr. P.K. Arora)

**CALIBRATION REPORT FOR
PITOT ΔP & LINEAR VELOCITY OF
STACK MONITORING SYSTEM**

REPORT NO. : POLLTECH / P / SMS/ 01-19 / 100

Name of the Party : M/s. Technovation Enterprises, Malaysia
Make, Model No. & Sr. No. : Polltech make, Model PEM-SMS4, Sr. No. 0818
Operating Conditions : **Barometric Pressure** : 1012.8 mBar;
Actual Ambient Temp. (T/C Cold Junction) : Ambient Temperature : 28.23°C; R.H : 40%
Date of Calibration : 03/01/2024
Next Calibration Due : 03/01/2025

Standard Reference Pressure (mm Wc)	Pitot ΔP Pressure Displayed (mm WC)	%Error (ΔP) (Full Scale Range: 100 mm WC)	Theoretically Calculated Stack Velocity (Meters / Sec.)	Actual Displayed Velocity (Meters / Sec.)	%Error (Linear Velocity) (Full Scale Range: 35 Meters / Sec.)
100.00	100.0	0.0	36.5	36.4	-0.1
80.32	80.4	+0.08	32.3	32.7	+0.4
60.68	61.0	+0.32	28.6	28.6	0.0
40.41	40.4	0.0	22.9	23.0	+0.1
30.31	30.5	+0.19	19.7	20.1	+0.7
20.49	20.4	0.0	16.2	16.3	+0.1
10.70	10.1	-0.6	11.7	11.6	-0.1
2.00	1.9	-0.1	5.0	5.0	0.0
0	0	0	0	0	0

Formula used is $V = K_p \cdot C_p \sqrt{\frac{\Delta P \cdot T_s}{P_s \cdot M_s}}$ where,

Following Parameters have been entered in SMS4 Control Module % also used in the above Formula

$K_p = 34.97$

$M_d = 28.8$

$C_p = 0.850$

$T_s = 273^\circ K + 28^\circ C = 301^\circ K$ (Stack T/c Temperature)

$P_s = 760$ mmHg

$M_s = 27.72$

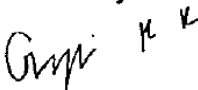
$$M_s = M_d \left[1 - \frac{\% \text{Moist.}}{100} \right] + 18 \times \left(\frac{\% \text{Moist.}}{100} \right)$$

% Moist. (entered) = 10%

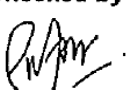
Remark : The overall error of the Pitot ΔP & Linear Velocity is within $\pm 2\%$ of F. S.

Test Apparatus Used : Certified Digital Pressure Calibrator, Model PSI-DPC2, Sr. No. 7617 with Certificate No. PICAL/1118/P/085 valid upto 25/11/2024

Calibrated by


(K.K. Gogari)

Checked by


(Dr. P.K. Arora)



**CALIBRATION REPORT FOR
STACK TEMPERATURE INDICATOR OF
STACK MONITORING SYSTEM**

REPORT NO. : POLLTECH / P / SMS/ 01-19 / 139

Name of the Party : M/s. Technovation Enterprises, Malaysia
Make, Model No. & Sr. No. : Polltech make, Model PEM-SMS4, Sr. No. 0818
Sensor Type : Solid State Temperature Sensor
Operating Conditions : **Barometric Pressure** : 1012.8 mBar; R.H : 40%
: **Ambient Temperature** : 28.23°C; Cold Junction Temperature: 28°C
Date of Calibration : 03/01/2024
Next Calibration Due : 03/01/2025

mV Input for Stack Temp. Sensor (K Type Thermocouple)	Corresponding Theoretical Values of Hot Junction Temp. °C	Expected Value °C Hot Junction + Cold Junction	Displayed Value of Temp. °C	Error ± °C
23.71	572	600	600	F. S. Adjusted
20.65	500	528	528	0
16.40	400	428	428	0
12.22	300	328	328	0
08.15	200	228	228	0
04.11	100	128	128	0
0	0	28	28	0

Remark : The overall error of the **Stack Temperature Measurement is ± 1°C** over Temperature Range from ambient to 600°C.

Test Apparatus Used : Certified Thermocouple Simulator Model PGE-TS1, Sr. No. 0114 with Certificate No. CC/ECL/1028/18-19 valid upto 09/11/2024

Calibrated by

(K.K. Gogari)

Checked by

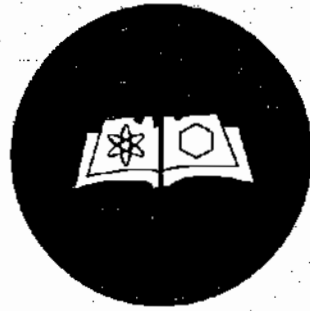
(Dr. P.K. Arora)

ELNA PCB (M) SDN BHD	
Date of Inspection	12 th June 2024
Report No.	AE/24/138N

STACK AIR EMISSION MONITORING

APPENDIX V

Certificate of Competency



PERAKUAN PENGEKALAN TAHUNAN
ANNUAL RETENTION CERTIFICATE

Maka inilah diperakui bahawa

This is to certify that

Boo Wei Ping

(Nama penuh)

(Name in full)

beralamat

of (Address)

No 10, Lorong 15/SS9,
Bandar Tasek Mutiara,
14120 Simpang Ampat, Pulau Pinang

yang didaftarkan di bawah Akta Ahli Kimia 1975, dan yang Perakuan
Pendaftarannya bernombor **M/5572/7052/15/20**

*who is registered under the Chemists Act 1975, and whose Certificate of
Registration bears the Number*

telah dikekalkan dalam daftar anggota-anggota Institut Kimia Malaysia sehingga
31 haribulan Disember **2024**

*has been retained on the register of members of the Malaysian Institute of
Chemistry until 31st December*

Dikeluarkan pada

17 October 2023

Issued this

Bayaran sebanyak RM 100 telah dibayar.

Fee RM 100 paid.


Pendaftar,
Institut Kimia Malaysia.
Registrar,
Malaysian Institute of
Chemistry

ELNA PCB (M) SDN BHD	
Date of Inspection	12 th June 2024
Report No.	AE/24/138N

STACK AIR EMISSION MONITORING

APPENDIX VI
Certificate of SAMM

**STANDARDS**
MALAYSIA

Certificate of Accreditation

No: SAMM 730

Accredited since: 7 August 2018

This is to certify that

AMCEN LAB SDN. BHD.
SEBERANG PERAI TENGAH, PULAU PINANG
MALAYSIA



Scan this QR Code or visit
www.ism.gov.my/cab-directories
for the current scope of accreditation

has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the *Skim Akreditasi Makmal Malaysia* (SAMM), the Laboratory Accreditation Scheme of Malaysia.

Laboratories accredited under SAMM meet the requirements of MS ISO/IEC 17025. This Malaysian Standard is identical with ISO/IEC 17025 published by the International Organization for Standardization (ISO).



(DATUK FADILAH BAHARIN)
Director General
Department of Standards Malaysia

Date of issue: 8 August 2021