

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM1(ICC)
Calibrated by : K.T.Ho
Date : 26/06/2026

Sampler

Model : TE-5170
Serial Number : S/N 0767

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
Next Calibration Due Date : 01 December 2026
Slope(m) : 2.07213
Intercept(b) : -0.03919
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition

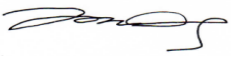
Pa (hpa) : 1004.4
Ta(K) : 303.5

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.4	3.182	1.555	58	57.23
2	13 holes	7.2	2.648	1.297	50	49.34
3	10 holes	5.5	2.314	1.136	40	39.47
4	7 holes	3.4	1.820	0.897	32	31.58
5	5 holes	2.0	1.396	0.692	24	23.68

Notes: $Z = \text{SQRT}\{dH(Pa/Pstd)(Tstd/Ta)\}$, $X = Z/m - b$, $Y(\text{Corrected Flow}) = IC * \{\text{SQRT}(Pa/Pstd)(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 39.734 Intercept(b): -4.055 Correlation Coefficient(r): 0.9956

Checked by: 
Magnum Fan

Date: 30/06/2026



Certificate of Calibration

Calibration Certification Information

Cal. Date: December 1, 2025 Roots-meter S/N: 438320 Ta: 294 °K
 Operator: Jim Tisch Pa: 755.4 mm Hg
 Calibration Model #: TE-5025A Calibrator S/N: 2454

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4240	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8620	8.8	5.50
5	9	10	1	0.7130	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)
1.0032	0.7045	1.4195	0.9958	0.6993	0.8823
0.9989	0.9861	2.0075	0.9915	0.9788	1.2477
0.9969	1.1028	2.2444	0.9895	1.0946	1.3950
0.9957	1.1551	2.3539	0.9884	1.1466	1.4631
0.9904	1.3891	2.8390	0.9831	1.3788	1.7645
QSTD	m=	2.07213	QA	m=	1.29754
	b=	-0.03919		b=	-0.02436
	r=	0.99999		r=	0.99999

Calculations

Vstd=	$\Delta Vol \left(\frac{Pa - \Delta P}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)$	Va=	$\Delta Vol \left(\frac{Pa - \Delta P}{Pa} \right)$
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: roots-meter 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



SUB-CONTRACTING REPORT

CONTACT	: MR MAGNUM FAN	WORK ORDER	: HK2618615
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T. HK	SUB-BATCH	: 1
		DATE RECEIVED	: 4-MAY-2026
		DATE OF ISSUE	: 13-MAY-2026
PROJECT	: Not Specified	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ---

General Comments

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
 - Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
 - Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.
 - Calibration was subcontracted to Envirotech Services Company.
-

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**

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Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK2618615
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : Not Specified



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2618615-001	Sibata LD-3B (235786)	Equipments	27-Apr-2026	S/N: 235786

----- END OF REPORT -----



Envirotech Services Co.

Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, H.K.
Tel : 2560 8450
Fax : 2560 6553
E-mail: envirotech@netvigator.com

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust Monitor
Manufacturer: Sibata LD-3B
Serial No.: 235786
Equipment Ref.: N/A
ALS Job Order: HK2617704

Standard Equipment

Standard Equipment: High Volume Sampler (TSP)
Location: Envirotech Room (Calibration Room)
Equipment Ref.: HVS 8162
Last Calibration Date: 21-Apr-2026

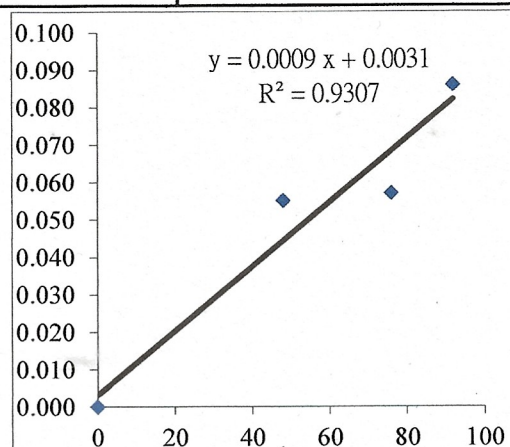
Equipment Verification Results:

Verification Date: 27-Apr-2026

Hour	Time	Mean Temp °C	Mean Pressure (hpa)	TSP Level in mg (Standard Equipment) (Y-Axis)	Total Count (Calibrated Equipment) (X-Axis)
1hr 00mins	0830-0930	23.8	1010.4	0.055	48
2hr 00mins	0935-1135	24.5	1010.1	0.057	76
3hr 00mins	1310-1610	26.8	1009.8	0.086	92

Linear Regression of Y or X

Slope (K-factor): 0.0009(mg)/Count
Correlation Coefficient (R): 0.9647
Date of Issue: 4-May-2026



Remarks:

1. Strong Correlation (>0.8)
2. Factor 0.0009(mg)/Count should be applied for TSP monitoring

*If $R < 0.5$, repair or verification is required for the equipment

Operator: P.F.Yeung Signature Pai Date: 04 May 2026

QC Reviewer: K.F.Ho Signature [Signature] Date: 04 May 2026

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Rm. 712, My Loft, Tuen Mun	Date of Calibration: 21-Apr-26
HVS ID: 8162	Next Calibration Date: 21-Jun-26
Name and Model : TISCH HVS Model TE-5170	Operator: K.F.Ho

CONDITIONS

Sea Level Pressure (hpa)	1014.5	Corrected Pressure (mm Hg)	760.9
Temperature (°C)	24.2	Temperature (K)	297.2

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.07213
Model:	TE-5025A	Qstd Intercept	-0.03199
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.1	5.9	12.0	1.694	60	60.13	Slope= 34.834 Intercept= 0.9938 Corr. Coeff.= 0.9998
13	4.9	4.8	9.7	1.525	54	54.12	
10	3.8	3.8	7.6	1.352	48	48.11	
7	2.5	2.5	5.0	1.132	40	40.09	
5	1.5	1.5	3.0	0.857	31	31.07	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

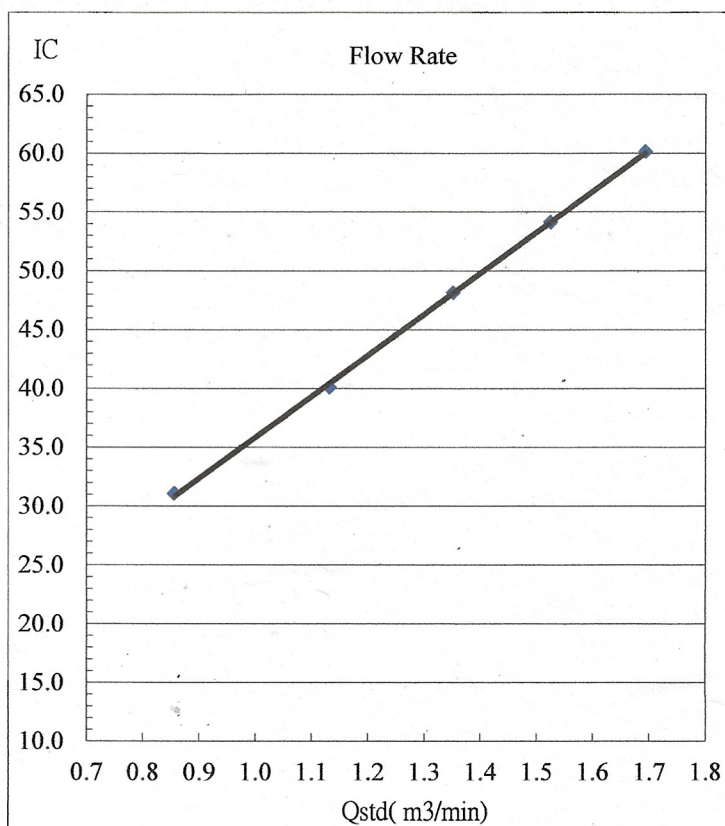
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Certificate of Calibration

Calibration Certification Information			
Cal. Date: December 1, 2025	Rootsmer S/N: 438320	Ta: 294 °K	
Operator: Jim Tisch		Pa: 755.4 mm Hg	
Calibration Model #: TE-5025A	Calibrator S/N: 2454		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4240	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8620	8.8	5.50
5	9	10	1	0.7130	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)
1.0032	0.7045	1.4195	0.9958	0.6993	0.8823
0.9989	0.9861	2.0075	0.9915	0.9788	1.2477
0.9969	1.1028	2.2444	0.9895	1.0946	1.3950
0.9957	1.1551	2.3539	0.9884	1.1466	1.4631
0.9904	1.3891	2.8390	0.9831	1.3788	1.7645
QSTD	m=	2.07213	QA	m=	1.29754
	b=	-0.03919		b=	-0.02436
	r=	0.99999		r=	0.99999

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:	rootsmer 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



SUB-CONTRACTING REPORT

CONTACT	: MR MAGNUM FAN	WORK ORDER	: HK2618618
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T. HK	SUB-BATCH	: 1
		DATE RECEIVED	: 4-MAY-2026
		DATE OF ISSUE	: 13-MAY-2026
PROJECT	: Not Specified	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ---

General Comments

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
 - Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
 - Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.
 - Calibration was subcontracted to Envirotech Services Company.
-

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**

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WORK ORDER : HK2618618
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : Not Specified



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2618618-001	Sibata LD-3B (276020)	Equipments	27-Apr-2026	S/N: 276020

----- END OF REPORT -----



Envirotech Services Co.

Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, H.K.
Tel : 2560 8450
Fax : 2560 6553
E-mail: envirotech@netvigator.com

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust Monitor
Manufacturer: Sibata LD-3B
Serial No.: 276020
Equipment Ref.: N/A
ALS Job Order: HK2617704

Standard Equipment

Standard Equipment: High Volume Sampler (TSP)
Location: Envirotech Room (Calibration Room)
Equipment Ref.: HVS 8162
Last Calibration Date: 21-Apr-2026

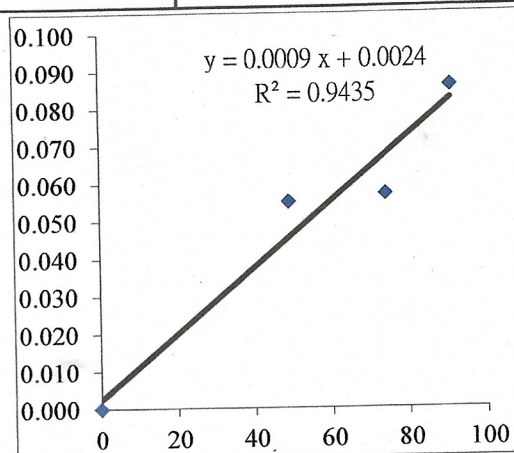
Equipment Verification Results:

Verification Date: 27-Apr-2026

Hour	Time	Mean Temp °C	Mean Pressure (hpa)	TSP Level in mg (Standard Equipment) (Y-Axis)	Total Count (Calibrated Equipment) (X-Axis)
1hr 00mins	0830-0930	23.8	1010.4	0.055	49
2hr 00mins	0935-1135	24.5	1010.1	0.057	74
3hr 00mins	1310-1610	26.8	1009.8	0.086	91

Linear Regression of Y or X

Slope (K-factor): 0.0009(mg)/Count
Correlation Coefficient (R): 0.9713
Date of Issue: 4-May-2026



Remarks:

1. Strong Correlation (>0.8)
2. Factor 0.0009(mg)/Count should be applied for TSP monitoring

*If $R < 0.5$, repair or verification is required for the equipment

Operator: P.F.Yeung Signature: Fai Date: 04 May 2026

QC Reviewer: K.F.Ho Signature: ab Date: 04 May 2026

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Rm. 712, My Loft, Tuen Mun	Date of Calibration: 21-Apr-26
HVS ID: 8162	Next Calibration Date: 21-Jun-26
Name and Model : TISCH HVS Model TE-5170	Operator: K.F.Ho

CONDITIONS

Sea Level Pressure (hpa)	1014.5	Corrected Pressure (mm Hg)	760.9
Temperature (°C)	24.2	Temperature (K)	297.2

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.07213
Model:	TE-5025A	Qstd Intercept	-0.03199
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.1	5.9	12.0	1.694	60	60.13	Slope= 34.834 Intercept= 0.9938 Corr. Coeff.= 0.9998
13	4.9	4.8	9.7	1.525	54	54.12	
10	3.8	3.8	7.6	1.352	48	48.11	
7	2.5	2.5	5.0	1.132	40	40.09	
5	1.5	1.5	3.0	0.857	31	31.07	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

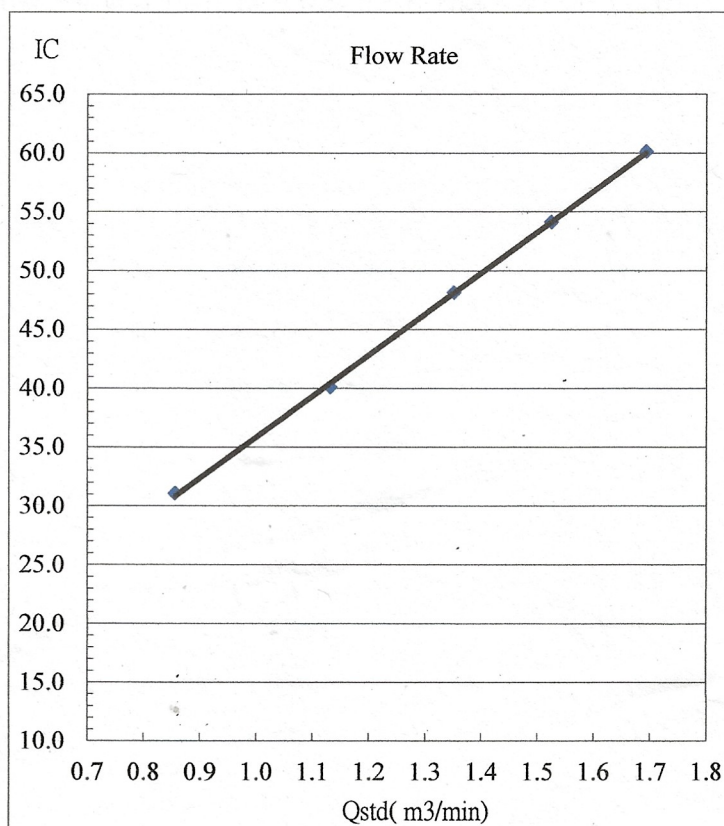
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Certificate of Calibration

Calibration Certification Information

Cal. Date: December 1, 2025 **Rootsmeter S/N:** 438320 **Ta:** 294 °K
Operator: Jim Tisch **Pa:** 755.4 mm Hg
Calibration Model #: TE-5025A **Calibrator S/N:** 2454

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4240	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8620	8.8	5.50
5	9	10	1	0.7130	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)
1.0032	0.7045	1.4195	0.9958	0.6993	0.8823
0.9989	0.9861	2.0075	0.9915	0.9788	1.2477
0.9969	1.1028	2.2444	0.9895	1.0946	1.3950
0.9957	1.1551	2.3539	0.9884	1.1466	1.4631
0.9904	1.3891	2.8390	0.9831	1.3788	1.7645
QSTD	m=	2.07213	QA	m=	1.29754
	b=	-0.03919		b=	-0.02436
	r=	0.99999		r=	0.99999

Calculations

Vstd = $\Delta Vol / ((Pa - \Delta P) / Pstd) (Tstd / Ta)$	Va = $\Delta Vol / ((Pa - \Delta P) / Pa)$
Qstd = $Vstd / \Delta Time$	Qa = $Va / \Delta Time$
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



SUB-CONTRACTING REPORT

CONTACT	: MR MAGNUM FAN	WORK ORDER	: HK2602822
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T. HK	SUB-BATCH	: 1
		DATE RECEIVED	: 24-DEC-2025
		DATE OF ISSUE	: 17-JAN-2026
PROJECT	: Not Specified	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ---

General Comments

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
- Calibration was subcontracted to Envirotech Services Company.
- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**

WORK ORDER : HK2602822
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : Not Specified



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2602822-001	Sibata LD-3B (831656)	Equipments	24-Dec-2025	S/N: 831656

----- END OF REPORT -----



Envirotech Services Co.

Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, H.K.
Tel : 2560 8450
Fax : 2560 6553
E-mail: envirotech@netvigator.com

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust Monitor
Manufacturer: Sibata LD-5R
Serial No.: 831656
Equipment Ref.: N/A
ALS Job Order: HK2555544

Standard Equipment

Standard Equipment: High Volume Sampler (TSP)
Location: Envirotech Room (Calibration Room)
Equipment Ref.: HVS 8162
Last Calibration Date: 13-Dec-2025

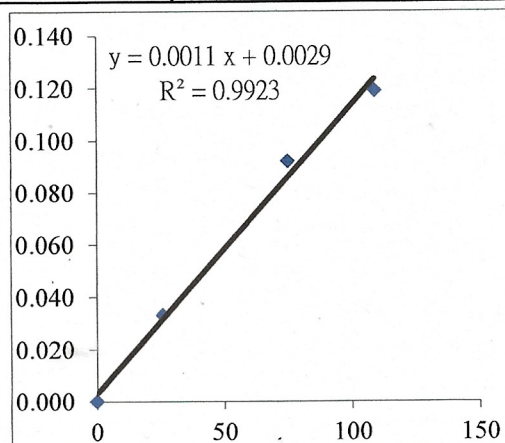
Equipment Verification Results:

Verification Date: 20-Dec-2025

Hour	Time	Mean Temp °C	Mean Pressure (hpa)	TSP Level in mg (Standard Equipment) (Y-Axis)	Total Count (Calibrated Equipment) (X-Axis)
1hr 00mins	0900-1000	23.8	1019.0	0.033	26
2hr 00mins	1005-1205	24.5	1020.0	0.092	75
3hr 00mins	1330-1630	25.1	1020.5	0.119	109

Linear Regression of Y or X

Slope (K-factor): $0.0011(\text{mg})/\text{Count}$
Correlation Coefficient (R): 0.9961
Date of Issue: 24-Dec-2025



Remarks:

1. Strong Correlation (>0.8)
2. Factor $0.0011(\text{mg})/\text{Count}$ should be applied for TSP monitoring

*If $R < 0.5$, repair or verification is required for the equipment

Operator: P.F.Yeung Signature Date: 24 Dec 2025

QC Reviewer: K.F.Ho Signature Date: 24 Dec 2025

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Rm. 712, My Loft, Tuen Mun				Date of Calibration:		13-Dec-25	
HVS ID: 8162				Next Calibration Date:		13-Feb-26	
Name and Model : TISCH HVS Model TE-5170				Operator:		K.F.Ho	

CONDITIONS							
Sea Level Pressure (hpa)				1018.2		Corrected Pressure (mm Hg)	
Temperature (°C)				23.5		Temperature (K)	
						763.7	
						296.5	

CALIBRATION ORIFICE							
Make:				TISCH		Qstd Slope	
Model:				TE-5025A		Qstd Intercept	
Serial#:				2454		-0.03199	

CALIBRATION							
Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.4	6.3	12.7	1.748	60	60.31	Slope= 34.754 Intercept= -0.3807 Corr. Coeff.= 0.9997
13	5.1	5.0	10.1	1.561	54	54.28	
10	4.0	3.9	7.9	1.382	47	47.25	
7	2.6	2.5	5.1	1.114	38	38.20	
5	1.6	1.5	3.1	0.873	30	30.16	

Calculations:

Qstd = $1/m[\text{Sqrt}(\text{H2O}(\text{Pa}/\text{Pstd})(\text{Tstd}/\text{Ta})) - b]$

IC = $I[\text{Sqrt}(\text{Pa}/\text{Pstd})(\text{Tstd}/\text{Ta})]$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$1/m(I[\text{Sqrt}(298/\text{Tav})(\text{Pav}/760)] - b)$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Qstd (m3/min)	IC
0.873	30.16
1.114	38.20
1.382	47.25
1.561	54.28
1.748	60.31



RECALIBRATION

DUE DATE:

December 1, 2026

Certificate of Calibration

Calibration Certification Information

Cal. Date: December 1, 2025 Rootsmeter S/N: 438320 Ta: 294 °K
Operator: Jim Tisch Pa: 755.4 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: 2454

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4240	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8620	8.8	5.50
5	9	10	1	0.7130	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)
1.0032	0.7045	1.4195	0.9958	0.6993	0.8823
0.9989	0.9861	2.0075	0.9915	0.9788	1.2477
0.9969	1.1028	2.2444	0.9895	1.0946	1.3950
0.9957	1.1551	2.3539	0.9884	1.1466	1.4631
0.9904	1.3891	2.8390	0.9831	1.3788	1.7645
QSTD	m=	2.07213	QA	m=	1.29754
	b=	-0.03919		b=	-0.02436
	r=	0.99999		r=	0.99999

Calculations

Vstd=	$\Delta Vol \left(\frac{Pa - \Delta P}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)$	Va=	$\Delta Vol \left(\frac{Pa - \Delta P}{Pa} \right)$
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. ATS25-066-CC007

Customer: **Envirotech Services Company**

Room 712, 7/F, My Loft,
9 Hoi Wing Road, Tuen Mun
N.T., Hong Kong

Unit-under-test (UUT):

Description: Precision Acoustic Calibrator
Manufacturer: Larson Davis
Type No.: CAL 200
Serial No.: 11334

Conditions during calibration:

Temperature: 26°C
Relative Humidity: 57%

Test Specifications: Calibration Check

Date of calibration: 20 September 2025

Test Results: All calibration points are within manufacturer's specification.

Certified by:


Mr. Y. T. LEUNG / Technical Manager
MIOA, MHKIOA, MHKIQEP



Issue Date: 20 September 2025

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.

2. Calibration equipment:

Description:	Sound Analyzer	Reference Microphone
Manufacturer:	Brüel & Kjær	Brüel & Kjær
Type No.:	2270	4189
Serial No.:	3001883	2662797
Last Calibration Date:	11 March 2025	11 March 2025
Certificate No.:	AV250047	AV250047

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.

4. Calibration Results

Nominal value dB	Measured value dB	IEC 60942 Class 1 Tolerance Limits dB	Conclusion	Expanded Measurement Uncertainty of Reference Microphone B&K 4189 at 1000 Hz dB
94.00	94.07	± 0.25	PASS	0.20
114.0	113.76	± 0.25	PASS	0.20

All calibration points are within manufacturer's specification.

Certificate of Calibration

Certificate No. ATS25-066-CC006

Customer: **Envirotech Services Company**

Room 712, 7/F, My Loft,
9 Hoi Wing Road, Tuen Mun
N.T., Hong Kong

Unit-under-test (UUT):

Description:	Sound Level Meter	,	Microphone	,	Pre-amplifier
Manufacturer:	RION	,	PCB Piezotronics	,	RION
Type No.:	NL-52	,	377B02	,	NH-25
Serial No.:	00643040	,	172764	,	21757

Conditions during calibration:

Temperature:	26°C
Relative Humidity:	57%

Test Specifications: Calibration Check

Date of calibration: 20 September 2025

Test Results: All calibration points are within manufacturer's specification.

Certified by:

 
Mr. Y. T. LEUNG / Technical Manager
MIOA, MHKIOA, MHKIQEP

Issue Date: 20 September 2025

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.

2. Calibration equipment:

Description: Acoustical Calibrator
Manufacturer & Type: Brüel & Kjær 4231
Serial No.: 2478237
Last Calibration Date: 18 February 2025
Certificate No.: AV250027

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The Sound Analyzer has been calibrated in accordance with the requirements as specified in IEC 61672-1 Class 1, and vendor specific procedures.

4. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.

5. Calibration Results

Setting of unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter*	Frequency Weighting	Response	Level, dB	Frequency, Hz			
30-130	Overall SPL	A	F	94.00	1000	94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
		C	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
		L	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
		A	F	114.00	1000	114.1	± 0.7	PASS
			S			114.1	± 0.7	PASS

* Based on the setting of the UUT, the reading is overall sound pressure level in dB(A), dB(C) & dB.

All calibration points are within manufacturer's specification.