



### SUB-CONTRACTING REPORT

CONTACT : MR MAGNUM FAN

CLIENT : ENVIROTECH SERVICES CO.

ADDRESS : RM 712, 7/F, MY LOFT 9 HOI WING ROAD,  
TUEN MUN, N.T. HK

PROJECT : -----

WORK ORDER : **HK2419606**

SUB-BATCH : 1

DATE RECEIVED : 20-MAY-2024

DATE OF ISSUE : 24-MAY-2024

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**

11/F Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong  
Tel. +852 2610 1044 Fax +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

WORK ORDER : HK2419606  
SUB-BATCH : 1  
CLIENT : ENVIROTECH SERVICES CO.  
PROJECT : .....



| ALS Lab ID    | Client's Sample ID    | Sample Type | Sample Date | External Lab Report No. |
|---------------|-----------------------|-------------|-------------|-------------------------|
| HK2419606-001 | Sibata LD 3B (436560) | Equipments  | 11-May-2024 | S/N: 436560             |

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



Envirotech Services Co.

Rm. 712, 7/F  
My Loft,  
9 Hoi Wing Road,  
Tuen Mun, H.K.  
Tel : 2660 8450  
Fax : 2660 8553  
E-mail: envirotech@navigator.com

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust Monitor  
Manufacturer: Sibata LD-3B  
Serial No.: 436560  
Equipment Ref.: N/A  
ALS Job Order: HK2418944

### Standard Equipment

Standard Equipment: High Volume Sampler (TSP)  
Location: Envirotech Room (Calibration Room)  
Equipment Ref.: HVS 8162  
Last Calibration Date: 25-Mar-2024

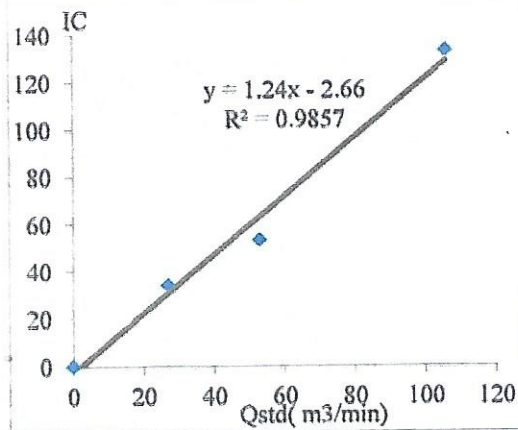
### Equipment Verification Results:

Verification Date: 11-May-2024

| Hour       | Time      | Mean Temp °C | Mean Pressure (hpa) | Concentration in $\mu\text{g}/\text{m}^3$ (Standard Equipment) (Y-Axis) | Concentration in $\mu\text{g}/\text{m}^3$ (Calibrated Equipment) (X-Axis) |
|------------|-----------|--------------|---------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 1hr 00mins | 0830-0930 | 26.8         | 1015                | 34                                                                      | 27                                                                        |
| 2hr 00mins | 0935-1135 | 28.5         | 1015                | 53                                                                      | 53                                                                        |
| 3hr 00mins | 1310-1610 | 29.5         | 1016                | 133                                                                     | 106                                                                       |

### Linear Regression of Y or X

Slope (K-factor):  $1.2400(\mu\text{g}/\text{m}^3)/\text{CPM}$   
Correlation Coefficient (R): 0.9928  
Date of Issue: 19-May-2024



### Remarks:

1. Strong Correlation ( $>0.8$ )
2. Factor  $1.2400(\mu\text{g}/\text{m}^3)/\text{CPM}$  should be applied for TSP monitoring

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

Operator: P.F.Yeung Signature Tai Date: 19 May 2024

QC Reviewer: K.F.Ho Signature Ho Date: 19 May 2024

# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Rm. 712, My Loft, Tuen Mun

HVS ID: 8162

Name and Model : TISCH HVS Model TE-5170

Date of Calibration:

25-Mar-24

Next Calibration Date:

24-May-24

Operator:

P.F. Yeung

## CONDITIONS

Sea Level Pressure (hpa)

1016

Corrected Pressure (mm Hg)

762.1

Temperature (°C)

24.5

Temperature (K)

297.5

## CALIBRATION ORIFICE

Make:

TISCH

Qstd Slope

2.07544

Model:

TE-5025A

Qstd Intercept

-0.03205

Serial#:

2454

## CALIBRATION

| Plate No. | H2O(L) (in) | H2O(R) (in) | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | LINEAR REGRESSION                                         |
|-----------|-------------|-------------|----------|---------------|-----------|----------------|-----------------------------------------------------------|
| 18        | 6.7         | 6.8         | 13.5     | 1.790         | 60        | 60.15          | Slope= 30.471<br>Intercept= 5.514<br>Corr. Coeff.= 0.9994 |
| 13        | 5.5         | 5.6         | 11.1     | 1.625         | 55        | 55.13          |                                                           |
| 10        | 4.3         | 4.5         | 8.8      | 1.448         | 49        | 49.12          |                                                           |
| 7         | 2.5         | 2.7         | 5.2      | 1.117         | 40        | 40.10          |                                                           |
| 5         | 1.5         | 1.7         | 3.2      | 0.879         | 32        | 32.08          |                                                           |

### 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:

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

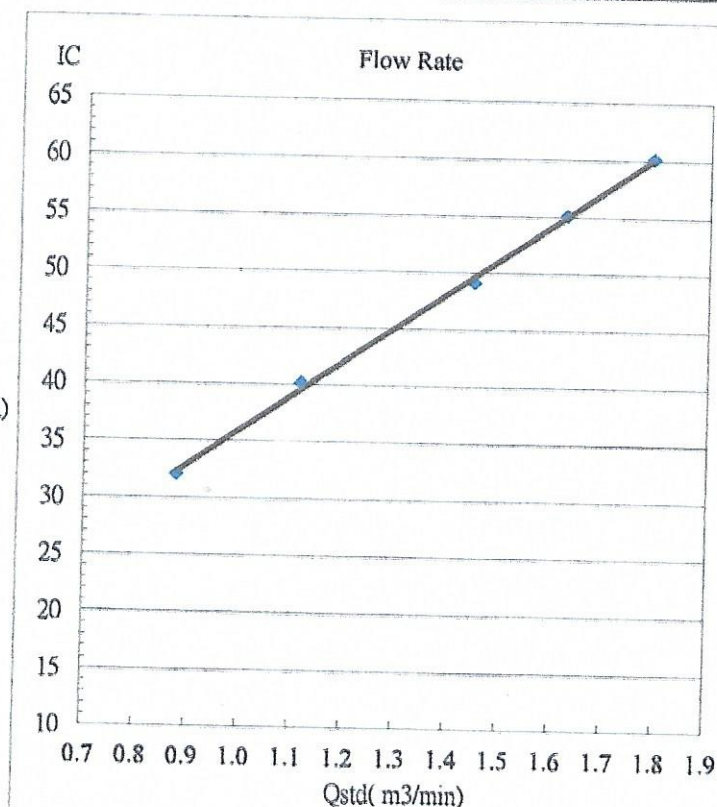
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





# Certificate of Calibration

## Calibration Certification Information

Cal. Date: December 15, 2023      Rootsmeter S/N: 438320      Ta: 295 °K  
Operator: Jim Tisch      Pa: 748.5 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          | 1.4250      | 3.2        | 2.00        |
| 2   | 3              | 4               | 1          | 1.0090      | 6.4        | 4.00        |
| 3   | 5              | 6               | 1          | 0.9040      | 7.9        | 5.00        |
| 4   | 7              | 8               | 1          | 0.8610      | 8.8        | 5.50        |
| 5   | 9              | 10              | 1          | 0.7110      | 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) |
|-------------|---------------|------------------------------------------------------------------------------------------|-----------|-------------|---------------------------------------------------------|
| 0.9907      | 0.6952        | 1.4106                                                                                   | 0.9957    | 0.6988      | 0.8878                                                  |
| 0.9864      | 0.9776        | 1.9949                                                                                   | 0.9914    | 0.9826      | 1.2556                                                  |
| 0.9844      | 1.0890        | 2.2304                                                                                   | 0.9894    | 1.0945      | 1.4037                                                  |
| 0.9832      | 1.1420        | 2.3393                                                                                   | 0.9882    | 1.1478      | 1.4723                                                  |
| 0.9779      | 1.3754        | 2.8213                                                                                   | 0.9829    | 1.3824      | 1.7756                                                  |
| <b>QSTD</b> | m=            | <b>2.07544</b>                                                                           | <b>QA</b> | m=          | <b>1.29961</b>                                          |
|             | b=            | <b>-0.03205</b>                                                                          |           | b=          | <b>-0.02017</b>                                         |
|             | r=            | <b>0.99999</b>                                                                           |           | r=          | <b>0.99999</b>                                          |

## 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:                                                                                             |                                           |                                                                                                 |                                |
| <b>Qstd=</b> $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$ |                                           | <b>Qa=</b> $1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$ |                                |

## Standard Conditions

|                                           |           |
|-------------------------------------------|-----------|
| Tstd:                                     | 298.15 °K |
| Pstd:                                     | 760 mm Hg |
| <b>Key</b>                                |           |
| 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  
CLIENT : ENVIROTECH SERVICES CO.  
ADDRESS : RM 712, 7/F, MY LOFT 9 HOI WING ROAD,  
TUEN MUN, N.T. HK  
PROJECT : ----

WORK ORDER : HK2423104  
SUB-BATCH : 1  
DATE RECEIVED : 8-JUN-2024  
DATE OF ISSUE : 17-JUN-2024  
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**

11/F Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong  
Tel. +852 2610 1044 Fax +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

WORK ORDER : HK2423104  
SUB-BATCH : 1  
CLIENT : ENVIROTECH SERVICES CO.  
PROJECT : ----



| ALS Lab ID    | Client's Sample ID    | Sample Type | Sample Date | External Lab Report No. |
|---------------|-----------------------|-------------|-------------|-------------------------|
| HK2423104-001 | Sibata LD-3B (476664) | Equipments  | 01-Jun-2024 | S/N: 476664             |

\*\*\*\*\* END OF REPORT \*\*\*\*\*



Envirotech Services Co.

Rm. 712, 7/F  
My Loft,  
9 Hoi Wing Road,  
Tuen Mun, H.K.  
Tel : 2660 8450  
Fax : 2660 8553  
E-mail: envirotech@netvigator.com

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust Monitor  
Manufacturer: Sibata LD-3B  
Serial No.: 476664  
Equipment Ref.: N/A  
ALS Job Order: HK2421761

### Standard Equipment

Standard Equipment: High Volume Sampler (TSP)  
Location: Envirotech Room (Calibration Room)  
Equipment Ref.: HVS 8162  
Last Calibration Date: 1-Jun-2024

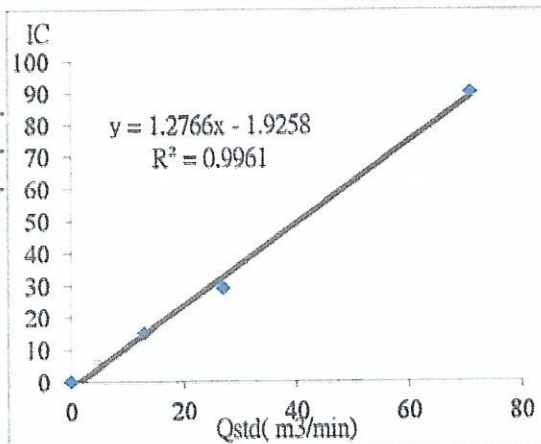
### Equipment Verification Results:

Verification Date: 1-Jun-2024

| Hour       | Time      | Mean Temp °C | Mean Pressure (hpa) | Concentration in $\mu\text{g}/\text{m}^3$ (Standard Equipment) (Y-Axis) | Concentration in $\mu\text{g}/\text{m}^3$ (Calibrated Equipment) (X-Axis) |
|------------|-----------|--------------|---------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 1hr 00mins | 0910-1010 | 27.2         | 1008                | 13                                                                      | 15                                                                        |
| 2hr 00mins | 1015-1215 | 27.3         | 1008                | 27                                                                      | 30                                                                        |
| 3hr 00mins | 1315-1615 | 27.4         | 1008                | 71                                                                      | 73                                                                        |

### Linear Regression of Y or X

Slope (K-factor):  $1.2766(\mu\text{g}/\text{m}^3)/\text{CPM}$   
Correlation Coefficient (R): 0.9980  
Date of Issue: 7-Jun-2024



### Remarks:

1. Strong Correlation ( $>0.8$ )
2. Factor  $1.2766(\mu\text{g}/\text{m}^3)/\text{CPM}$  should be applied for TSP monitoring

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

Operator: P.F.Yeung Signature Kai Date: 07 June 2024

QC Reviewer: K.F.Ho Signature at Date: 07 June 2024

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

|                                          |                                  |
|------------------------------------------|----------------------------------|
| Location : Rm. 712, My Loft, Tuen Mun    | Date of Calibration: 1-Jun-24    |
| HVS ID: 8162                             | Next Calibration Date: 31-Aug-24 |
| Name and Model : TISCH HVS Model TE-5170 | Operator: K.F.Ho                 |

### CONDITIONS

|                                                                                             |                                                                                              |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Sea Level Pressure (hpa) <span style="border: 1px solid black; padding: 2px;">1008.2</span> | Corrected Pressure (mm Hg) <span style="border: 1px solid black; padding: 2px;">756.2</span> |
| Temperature (°C) <span style="border: 1px solid black; padding: 2px;">27.2</span>           | Temperature (K) <span style="border: 1px solid black; padding: 2px;">300.2</span>            |

### CALIBRATION ORIFICE

|                                                                             |                                                                                     |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Make: <span style="border: 1px solid black; padding: 2px;">TISCH</span>     | Qstd Slope <span style="border: 1px solid black; padding: 2px;">2.07544</span>      |
| Model: <span style="border: 1px solid black; padding: 2px;">TE-5025A</span> | Qstd Intercept <span style="border: 1px solid black; padding: 2px;">-0.03205</span> |
| Serial#: <span style="border: 1px solid black; padding: 2px;">2454</span>   |                                                                                     |

### CALIBRATION

| Plate No. | H2O(L) (in) | H2O(R) (in) | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | LINEAR REGRESSION                                          |
|-----------|-------------|-------------|----------|---------------|-----------|----------------|------------------------------------------------------------|
| 18        | 6.5         | 6.5         | 13.0     | 1.742         | 62        | 61.63          | Slope= 48.07<br>Intercept= -22.843<br>Corr. Coeff.= 0.9974 |
| 13        | 5.4         | 5.4         | 10.8     | 1.590         | 54        | 53.68          |                                                            |
| 10        | 4.2         | 4.2         | 8.4      | 1.318         | 40        | 39.76          |                                                            |
| 7         | 2.7         | 2.7         | 5.4      | 1.128         | 30        | 29.82          |                                                            |
| 5         | 1.7         | 1.7         | 3.4      | 0.899         | 22        | 21.87          |                                                            |

#### 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:

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

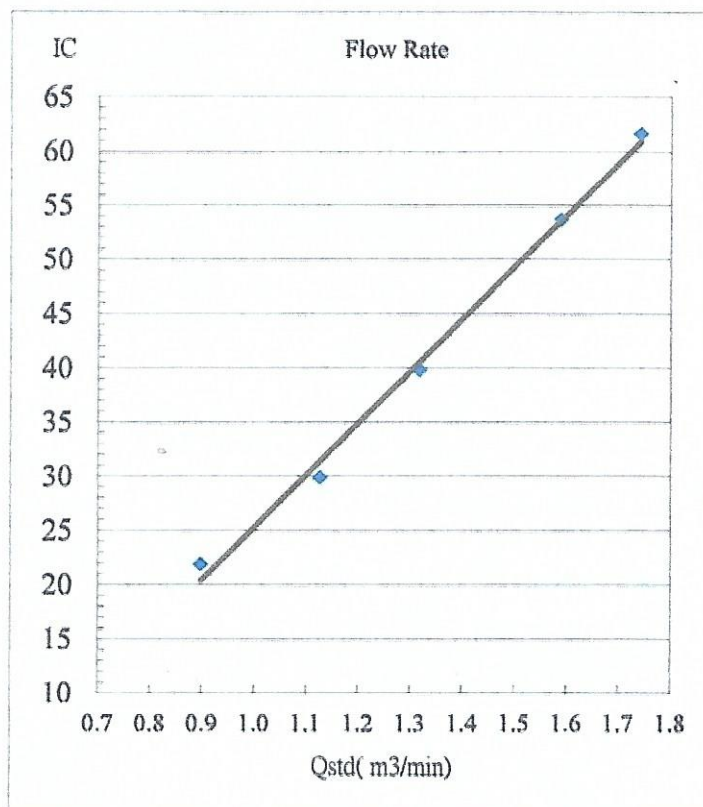
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## Certificate of Calibration

### Calibration Certification Information

|                               |                             |                 |
|-------------------------------|-----------------------------|-----------------|
| Cal. Date: December 15, 2023  | Rootsmeter S/N: 438320      | Ta: 295 °K      |
| Operator: Jim Tisch           |                             | Pa: 748.5 mm Hg |
| Calibration Model #: TE-5025A | Calibrator S/N: <b>2454</b> |                 |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|-----|----------------|-----------------|------------|-------------|------------|-------------|
| 1   | 1              | 2               | 1          | 1.4250      | 3.2        | 2.00        |
| 2   | 3              | 4               | 1          | 1.0090      | 6.4        | 4.00        |
| 3   | 5              | 6               | 1          | 0.9040      | 7.9        | 5.00        |
| 4   | 7              | 8               | 1          | 0.8610      | 8.8        | 5.50        |
| 5   | 9              | 10              | 1          | 0.7110      | 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) |
|-------------|---------------|------------------------------------------------------------------------------------------|-----------|-------------|---------------------------------------------------------|
| 0.9907      | 0.6952        | 1.4106                                                                                   | 0.9957    | 0.6988      | 0.8878                                                  |
| 0.9864      | 0.9776        | 1.9949                                                                                   | 0.9914    | 0.9826      | 1.2556                                                  |
| 0.9844      | 1.0890        | 2.2304                                                                                   | 0.9894    | 1.0945      | 1.4037                                                  |
| 0.9832      | 1.1420        | 2.3393                                                                                   | 0.9882    | 1.1478      | 1.4723                                                  |
| 0.9779      | 1.3754        | 2.8213                                                                                   | 0.9829    | 1.3824      | 1.7756                                                  |
| <b>QSTD</b> | m=            | <b>2.07544</b>                                                                           | <b>QA</b> | m=          | <b>1.29961</b>                                          |
|             | b=            | <b>-0.03205</b>                                                                          |           | b=          | <b>-0.02017</b>                                         |
|             | r=            | <b>0.99999</b>                                                                           |           | r=          | <b>0.99999</b>                                          |

### 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