# High-Volume TSP Sampler
# 5-POINT CALIBRATION DATA SHEET

**CINOTECH**

File No. MA16034/05/0025

Project No. AM1 - Tin Hau Temple

Date: 10-Aug-20    Next Due Date: 10-Oct-20    Operator: SK

Equipment No.: A-01-05    Model No.: GS2310    Serial No. 10599

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 304 | Pressure, Pa (mmHg) | 760 |

| Orifice Transfer Standard Information | | | | |
|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | | |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ | | |

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orifice | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) **X - axis** | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis** |
| 1 | 12.9 | 3.56 | 60.53 | 8.5 | 2.89 |
| 2 | 9.4 | 3.04 | 51.74 | 6.3 | 2.49 |
| 3 | 7.5 | 2.71 | 46.26 | 4.8 | 2.17 |
| 4 | 4.8 | 2.17 | 37.10 | 3.2 | 1.77 |
| 5 | 2.6 | 1.60 | 27.43 | 1.8 | 1.33 |

**By Linear Regression of Y on X**

Slope , mw = 0.0472    Intercept, bw = 0.0206

Correlation coefficient* = 0.9993

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = ( mw x Qstd + bw )² x ( 760 / Pa ) x ( Ta / 298 ) =    4.29

Remarks:

Conducted by: SK Wong    Signature:    Date: 10 August 2020

Checked by: Henry Leung    Signature:    Date: 10 August 2020

# High-Volume TSP Sampler
# 5-POINT CALIBRATION DATA SHEET

File No.  MA16034/08/0025

| Project No. | AM2 - Sai Tso Wan Recreation Ground | | | | |
|---|---|---|---|---|---|
| Date: | 10-Aug-20 | Next Due Date: | 10-Oct-20 | Operator: | SK |
| Equipment No.: | A-01-08 | Model No.: | GS2310 | Serial No. | 1287 |

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 304 | Pressure, Pa (mmHg) | 760 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc | | | |

$$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$$
$$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$$

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orfice | | | HVS | |
| | ΔH (orifice), in. of water | [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ | Qstd (CFM) X - axis | ΔW (HVS), in. of water | [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ Y-axis |
| 1 | 12.9 | 3.56 | 60.53 | 8.5 | 2.89 |
| 2 | 9.8 | 3.10 | 52.82 | 6.1 | 2.45 |
| 3 | 7.8 | 2.77 | 47.17 | 4.8 | 2.17 |
| 4 | 4.8 | 2.17 | 37.10 | 3.0 | 1.71 |
| 5 | 2.8 | 1.66 | 28.45 | 1.9 | 1.36 |

**By Linear Regression of Y on X**

Slope , mw =        0.0471                    Intercept, bw =        -0.0112

Correlation coefficient* =        0.9977

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = ( mw x Qstd + bw )$^2$ x ( 760 / Pa ) x ( Ta / 298 ) =        4.13

Remarks:

| | | | | |
|---|---|---|---|---|
| Conducted by: | SK Wong | Signature: | Date: | 10 August 2020 |
| Checked by: | Henry Leung | Signature: | Date: | 10 August 2020 |

# High-Volume TSP Sampler
## 5-POINT CALIBRATION DATA SHEET

File No.  MA16034/03/0025

Project No.     AM3 - Yau Lai Estate, Bik Lai House

Date:        10-Aug-20        Next Due Date:        10-Oct-20        Operator:        SK

Equipment No.:   A-01-03        Model No.:     GS2310        Serial No.     10379

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 304 | Pressure, Pa (mmHg) | 760 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ |

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| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orfice | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) X - axis | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis |
| 1 | 13.0 | 3.57 | 60.76 | 8.6 | 2.90 |
| 2 | 9.4 | 3.04 | 51.74 | 6.4 | 2.50 |
| 3 | 7.7 | 2.75 | 46.87 | 5.1 | 2.24 |
| 4 | 5.1 | 2.24 | 38.23 | 3.3 | 1.80 |
| 5 | 2.5 | 1.57 | 26.91 | 2.0 | 1.39 |

**By Linear Regression of Y on X**

   Slope , mw =      0.0455              Intercept, bw =           0.1241

   Correlation coefficient* =            0.9973

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

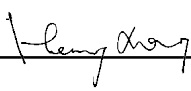From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

   Therefore, Set Point; W = ( mw x Qstd + bw )$^2$ x ( 760 / Pa ) x ( Ta / 298 ) =            4.42

Remarks:

Conducted by:   SK Wong        Signature:                        Date:    10 August 2020

Checked by:  Henry Leung    Signature:                        Date:    10 August 2020

F:\Cinotech Solutions\Equipment\Calibration Cert\HVS\new\MA16034_20200810_AM3_(A-01-03).xls

# High-Volume TSP Sampler
# 5-POINT CALIBRATION DATA SHEET

| Project No. | AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office | | | | |
|---|---|---|---|---|---|
| Date: | 10-Aug-20 | Next Due Date: | 10-Oct-20 | Operator: | SK |
| Equipment No.: | A-01-54 | Model No.: | TE-5170 | Serial No. | 1536 |

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 304 | Pressure, Pa (mmHg) | 760 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ | | | |

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orfice | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) X - axis | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis |
| 1 | 12.8 | 3.54 | 60.30 | 8.6 | 2.90 |
| 2 | 9.8 | 3.10 | 52.82 | 6.3 | 2.49 |
| 3 | 7.4 | 2.69 | 45.96 | 5.0 | 2.21 |
| 4 | 5.2 | 2.26 | 38.60 | 3.2 | 1.77 |
| 5 | 2.9 | 1.69 | 28.94 | 1.8 | 1.33 |

**By Linear Regression of Y on X**

Slope , mw = 0.0502          Intercept, bw = -0.1354

Correlation coefficient* = 0.9987

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = ( mw x Qstd + bw )² x ( 760 / Pa ) x ( Ta / 298 ) =          4.18

Remarks: _____

_____

| Conducted by: | SK Wong | Signature: | | Date: | 10 August 2020 |
|---|---|---|---|---|---|
| Checked by: | Henry Leung | Signature: | | Date: | 10 August 2020 |

# High-Volume TSP Sampler
## 5-POINT CALIBRATION DATA SHEET

**CINOTECH**

File No. MA16034/05/0026

Project No. __AM1 - Tin Hau Temple__

Date: __10-Oct-20__    Next Due Date: __10-Dec-20__    Operator: __SK__

Equipment No.: __A-01-05__    Model No.: __GS2310__    Serial No. __10599__

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 299.5 | Pressure, Pa (mmHg) | 759.5 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ | | | |

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orfice | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) **X - axis** | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis** |
| 1 | 13.0 | 3.60 | 61.19 | 8.6 | 2.92 |
| 2 | 9.5 | 3.07 | 52.38 | 6.4 | 2.52 |
| 3 | 7.6 | 2.75 | 46.90 | 4.8 | 2.18 |
| 4 | 4.8 | 2.18 | 37.37 | 3.2 | 1.78 |
| 5 | 2.6 | 1.61 | 27.62 | 1.8 | 1.34 |

**By Linear Regression of Y on X**

Slope , mw = __0.0474__    Intercept, bw = __0.0129__

Correlation coefficient* = __0.9988__

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

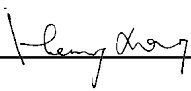From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ __4.23__

Remarks: _____

Conducted by: __SK Wong__    Signature: _____    Date: __10 October 2020__

Checked by: __Henry Leung__    Signature: _____    Date: __10 October 2020__

# High-Volume TSP Sampler
# 5-POINT CALIBRATION DATA SHEET

File No.  MA16034/08/0026

Project No.    AM2 - Sai Tso Wan Recreation Ground

Date:          10-Oct-20         Next Due Date:        10-Dec-20        Operator:        SK

Equipment No.:    A-01-08        Model No.:        GS2310        Serial No.        1287

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 299.5 | Pressure, Pa (mmHg) | 759.5 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ | | | |

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orifce | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) **X - axis** | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis** |
| 1 | 13.0 | 3.60 | 61.19 | 8.6 | 2.92 |
| 2 | 9.9 | 3.14 | 53.46 | 6.2 | 2.48 |
| 3 | 7.9 | 2.80 | 47.81 | 4.8 | 2.18 |
| 4 | 4.8 | 2.18 | 37.37 | 3.0 | 1.73 |
| 5 | 2.8 | 1.67 | 28.65 | 1.9 | 1.37 |

**By Linear Regression of Y on X**

Slope , mw =      0.0472                    Intercept, bw =         -0.0191

Correlation coefficient* =            0.9972

*If Correlation Coefficient < 0.990, check and recalibrate.
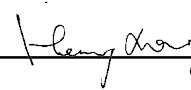
| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760/Pa) \times (Ta/298) =$        4.07

Remarks: _____

_____

Conducted by:    SK Wong    Signature: _____    Date:    10 October 2020

Checked by:    Henry Leung    Signature: _____    Date:    10 October 2020

# High-Volume TSP Sampler
## 5-POINT CALIBRATION DATA SHEET

File No.   MA16034/03/0026

Project No.   AM3 - Yau Lai Estate, Bik Lai House

| Date: | 10-Oct-20 | Next Due Date: | 10-Dec-20 | Operator: | SK |
|---|---|---|---|---|---|
| Equipment No.: | A-01-03 | Model No.: | GS2310 | Serial No. | 10379 |

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 299.5 | Pressure, Pa (mmHg) | 759.5 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$ | | | |

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orifice | | | HVS | |
| | $\Delta H$ (orifice), in. of water | $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (CFM) X - axis | $\Delta W$ (HVS), in. of water | $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis |
| 1 | 13.1 | 3.61 | 61.43 | 8.7 | 2.94 |
| 2 | 9.5 | 3.07 | 52.38 | 6.5 | 2.54 |
| 3 | 7.7 | 2.77 | 47.20 | 5.2 | 2.27 |
| 4 | 5.2 | 2.27 | 38.87 | 3.4 | 1.84 |
| 5 | 2.6 | 1.61 | 27.62 | 2.0 | 1.40 |

**By Linear Regression of Y on X**

Slope , mw = 0.0463          Intercept, bw = 0.0915

Correlation coefficient* = 0.9984

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = ( mw x Qstd + bw )$^2$ x ( 760 / Pa ) x ( Ta / 298 ) =   4.37

Remarks:

| Conducted by: | SK Wong | Signature: | | Date: | 10 October 2020 |
|---|---|---|---|---|---|
| Checked by: | Henry Leung | Signature: | | Date: | 10 October 2020 |

# High-Volume TSP Sampler
## 5-POINT CALIBRATION DATA SHEET

File No. MA16034/54/0026

Project No. AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

| Date: | 10-Oct-20 | Next Due Date: | 10-Dec-20 | Operator: | SK |
|---|---|---|---|---|---|
| Equipment No.: | A-01-54 | Model No.: | TE-5170 | Serial No. | 1536 |

| Ambient Condition | | | |
|---|---|---|---|
| Temperature, Ta (K) | 299.5 | Pressure, Pa (mmHg) | 759.5 |

| Orifice Transfer Standard Information | | | | | |
|---|---|---|---|---|---|
| Serial No. | 3746 | Slope, mc | 0.0592 | Intercept, bc | -0.02740 |
| Last Calibration Date: | 17-Jan-20 | mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ | | | |
| Next Calibration Date: | 17-Jan-21 | Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc | | | |

$$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$$
$$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$$

| Calibration of TSP Sampler | | | | | |
|---|---|---|---|---|---|
| Calibration Point | Orifice | | | HVS | |
| | ΔH (orifice), in. of water | [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ | Qstd (CFM) X - axis | ΔW (HVS), in. of water | [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ Y-axis |
| 1 | 12.9 | 3.58 | 60.96 | 8.7 | 2.94 |
| 2 | 9.9 | 3.14 | 53.46 | 6.4 | 2.52 |
| 3 | 7.5 | 2.73 | 46.59 | 5.1 | 2.25 |
| 4 | 5.4 | 2.32 | 39.60 | 3.3 | 1.81 |
| 5 | 3.0 | 1.73 | 29.64 | 1.9 | 1.37 |

**By Linear Regression of Y on X**

Slope , mw = 0.0502          Intercept, bw = -0.1302

Correlation coefficient* = 0.9982

*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation |
|---|

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = ( mw x Qstd + bw )$^2$ x ( 760 / Pa ) x ( Ta / 298 ) =          4.13

Remarks: _____

_____

| Conducted by: | SK Wong | Signature: | | Date: | 10 October 2020 |
|---|---|---|---|---|---|
| Checked by: | Henry Leung | Signature: | | Date: | 10 October 2020 |

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

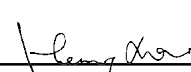| | | |
|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration _____ 5-Oct-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record _____ 5-Dec-20 |
| Model No.: | LD-5R | |
| Serial No.: | 972777 | |
| Equipment No.: SA-01-06 | Sensitivity _____ 0.001 mg/m3 | |
| High Volume Sampler No.: A-01-03 | Before Sensitivity Adjustment _____ 645 | |
| Tisch Calibration Orifice No.: 3607 | After Sensitivity Adjustment _____ 645 | |

| Calibration of 1 hr TSP | | |
|---|---|---|
| **Calibration Point** | **Laser Dust Monitor** | **HVS** |
| | Mass Concentration (μg/m3) **X-axis** | Mass concentration (μg/m$^3$) **Y-axis** |
| 1 | 43.0 | 78.9 |
| 2 | 36.0 | 75.2 |
| 3 | 29.0 | 70.8 |
| **Average** | **36.0** | **75.0** |

**By Linear Regression of Y on X**

**Slope , mw =** _____ 0.5786 _____ **Intercept, bw =** _____ 54.1381

**Correlation coefficient\* =** _____ 0.9988

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler (μg/m$^3$) | 75.0 |
| Particaulate Concentration by Dust Meter (μg/m$^3$) | 36.0 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, (μg/m3) ]** | _____ 2.1 _____ |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____

Wong Shing Kwai

Approved by: _____

Henry Leung

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

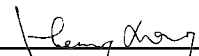| | | |
|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration _____ 5-Oct-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record _____ 5-Dec-20 |
| Model No.: | LD-5R | |
| Serial No.: | 972778 | |
| Equipment No.: | SA-01-07 | Sensitivity _____ 0.001 mg/m3 |
| High Volume Sampler No.: | A-01-01A | Before Sensitivity Adjustment _____ 735 CPM |
| Tisch Calibration Orifice No.: | 3607 | After Sensitivity Adjustment _____ 735 CPM |

| Calibration of 1 hr TSP | | |
|---|---|---|
| **Calibration Point** | **Laser Dust Monitor** | **HVS** |
| | Mass Concentration (μg/m3) **X-axis** | Mass concentration (μg/m$^3$) **Y-axis** |
| 1 | 45.0 | 78.9 |
| 2 | 34.0 | 75.2 |
| 3 | 23.0 | 70.8 |
| **Average** | **34.0** | **75.0** |

**By Linear Regression of Y on X**

| | | | |
|---|---|---|---|
| **Slope , mw =** | 0.3682 | **Intercept, bw =** | 62.4485 |
| **Correlation coefficient\* =** | 0.9988 | | |

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler (μg/m$^3$) | 75.0 |
| Particaulate Concentration by Dust Meter (μg/m$^3$) | 34.0 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, (μg/m3) ]** | **2.2** |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

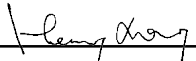| | | | |
|---|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration | 5-Oct-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record | 5-Dec-20 |
| Model No.: | LD-5R | | |
| Serial No.: | 972779 | | |
| Equipment No.: | SA-01-08 | Sensitivity | 0.001 mg/m3 |
| High Volume Sampler No.: | A-01-01A | Before Sensitivity Adjustment | 744 CPM |
| Tisch Calibration Orifice No.: | 3607 | After Sensitivity Adjustment | 744 CPM |

| Calibration of 1 hr TSP | | |
|---|---|---|
| Calibration Point | **Laser Dust Monitor**<br>Mass Concentration ($\mu$g/m3)<br>**X-axis** | **HVS**<br>Mass concentration ($\mu$g/m$^3$)<br>**Y-axis** |
| 1 | 49.0 | 78.9 |
| 2 | 38.0 | 75.2 |
| 3 | 28.0 | 70.8 |
| **Average** | **38.3** | **75.0** |

**By Linear Regression of Y on X**

**Slope , mw =** 0.3849      **Intercept, bw =** 60.2124

**Correlation coefficient\* =** 0.9970

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler ($\mu$g/m$^3$) | 75.0 |
| Particaulate Concentration by Dust Meter ($\mu$g/m$^3$) | 38.3 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, ($\mu$g/m3) ]** | **2.0** |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

# Calibration Certificate

**0023156**

| Customer : | | Object 1 : | SVAN979 SLM |
|---|---|---|---|
| Cinotech Consultants Limited | | Serial No. /Ref. No. : | 27190 / SN-01-02 |
| RM 1710, Technology Park, | | Object 2 : | Microphone |
| 18 On Lai Street, Shatin, N.T. | | Serial No. /Ref. No. : | 25202 |
| Hong Kong | | | |
| Customer Code : SVEC09005 | | Manufacturer : BSWAtech | |
| Date of calibration: 08/01/2020 | | Certificate No.: 0023156 | |
| Date of the recommended re-calibration: 08/01/2021 | | Handle by: E0002 | |

## Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
|---|---|---|---|---|
| 94.0dB | 94.0dB | 0.0dB | +/- 1.5dB | 1 |
| 114.0dB | 113.9dB | -0.1dB | +/- 1.5dB | 1 |

## Measuring equipment

| index | Calibrator / Master | Traceability |
|---|---|---|
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A      sn:32580 | IEC60942 |

## Ambient conditions

Temperature   (20...26)°C                 Humidity   (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

## Uncertainty

+/- 0.2 dB    for probability not less than 95%.

## Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

**Performed by**

Calibration Technician

**Approved by**

Quality Manager

Appleone Calibration Laboratory Ltd.      Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR    Tel: +852 2370 4437  Fax: +852 2114 0393

# Calibration Certificate

**0023155**

| Customer : | | Object 1 : | SVAN979 SLM |
|---|---|---|---|
| Cinotech Consultants Limited | | Serial No. /Ref. No. : | 27189 / SN-01-01 |
| RM 1710, Technology Park, | | Object 2 : | Microphone |
| 18 On Lai Street, Shatin, N.T. | | Serial No. /Ref. No. : | 25204 |
| Hong Kong | | | |
| Customer Code : SVEC09005 | | Manufacturer : BSWAtech | |
| Date of calibration: 08/01/2020 | | Certificate No.: 0023155 | |
| Date of the recommended re-calibration: 08/01/2021 | | Handle by: E0002 | |

## Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
|---|---|---|---|---|
| 94.0dB | 93.7dB | -0.3dB | +/- 1.5dB | 1 |
| 114.0dB | 113.6dB | -0.4dB | +/- 1.5dB | 1 |

## Measuring equipment

| index | Calibrator / Master | Traceability |
|---|---|---|
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A     sn:32580 | IEC60942 |

## Ambient conditions

Temperature   (20...26)°C           Humidity   (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

## Uncertainty

+/- 0.2 dB    for probability not less than 95%.

## Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

**Performed by**

Calibration Technician

**Approved by**

Quality Manager

# Calibration Certificate

**0022999**

| Customer : | | Object 1 : | SVAN957 SLM |
|---|---|---|---|
| Cinotech Consultants Limited | | Serial No. /Ref. No. : | 23851 / N-08-12 |
| RM 1710, Technology Park, | | Object 2 : | Microphone |
| 18 On Lai Street, Shatin, N.T. | | Serial No. /Ref. No. : | 43676 |
| Hong Kong | | | |
| Customer Code : SVEC09005 | | Manufacturer : Svantek | |
| Date of calibration: | 19/12/2019 | Certificate No.: | 0022999 |
| Date of the recommended re-calibration: | 19/12/2020 | Handle by: | E0002 |

## Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
|---|---|---|---|---|
| 94.0dB | 94.0dB | 0.0dB | +/- 1.5dB | 1 |
| 114.0dB | 114.0dB | 0.0dB | +/- 1.5dB | 1 |

## Measuring equipment

| index | Calibrator / Master | Traceability |
|---|---|---|
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A        sn:32580 | IEC60942 |

## Ambient conditions

Temperature   (20...26)°C                    Humidity   (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

## Uncertainty

+/- 0.2 dB     for probability not less than 95%.

## Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.

2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.

3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.

4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.

5.The calibrations certificate may not be reproduced.

**Measured value(s)** | within | **the allowable deviation.**

**Performed by**

_____

Calibration Technician

**Approved by**

_____

Quality Manager

Appleone Calibration Laboratory Ltd.      Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR      Tel: +852 2370 4437  Fax: +852 2114 0393

# Calibration Certificate

| Customer : | Object 1 : | SV30A sound calibrator |
| --- | --- | --- |

**Customer :**
Cinotech Consultants Limited
RM 1710, Technology Park,
18 On Lai Street, Shatin, N.T.
Hong Kong

**Customer Code :**  SVEC09005

| Object 1 : | SV30A sound calibrator |
| --- | --- |
| Serial No. /Ref. No. : | 10965 / N-09-02 |
| Object 2 : | |
| Serial No. /Ref. No. : | |

**Manufacturer :**  Svantek

| Date of calibration: | 19/12/2019 | Certificate No.: | 0023002 |
| --- | --- | --- | --- |
| Date of the recommended re-calibration: | 19/12/2020 | Handle by: | E0002 |

## Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
| --- | --- | --- | --- | --- |
| 94.0dB | 93.9dB | -0.1dB | +/-  0.3dB | 1 |
| 114.0dB | 114.2dB | +0.2dB | +/-  0.3dB | 1 |

## Measuring equipment

| index | Calibrator / Master | Traceability |
| --- | --- | --- |
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A       sn:32580 | IEC60942 |

## Ambient conditions

Temperature   (20...26)°C            Humidity   (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

## Uncertainty

+/-  0.2 dB    for probability not less than 95%.

## Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to  ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

**Performed by**

Calibration Technician

**Approved by**

Quality Manager

Appleone Calibration Laboratory Ltd.      Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR      Tel: +852 2370 4437  Fax: +852 2114 0393

# Calibration Certificate

## 0023001

| | |
|---|---|
| Customer : <br> Cinotech Consultants Limited <br> RM 1710, Technology Park, <br> 18 On Lai Street, Shatin, N.T. <br> Hong Kong | Object 1 :    B&K4231 sound calibrator <br> Serial No. /Ref. No. :   2326353 / N-02-01 <br> Object 2 : <br> Serial No. /Ref. No. : |
| Customer Code :    SVEC09005 | Manufacturer :    Bruel & Kjaer |
| Date of calibration:              19/12/2019 <br> Date of the recommended re-calibration:   19/12/2020 | Certificate No.:      0023001 <br> Handle by:        E0002 |

## Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
|---|---|---|---|---|
| 94.0dB | 94.2dB | +0.2dB | +/-  0.2dB | 1 |
| 114.0dB | 114.1dB | +0.1dB | +/-  0.2dB | 1 |

## Measuring equipment

| index | Calibrator / Master | Traceability |
|---|---|---|
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A        sn:32580 | IEC60942 |

## Ambient conditions

Temperature   (20...26)°C             Humidity   (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

## Uncertainty

+/-  0.2 dB     for probability not less than 95%.

## Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to  ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

Performed by

Calibration Technician

Approved by

Quality Manager

## Calibration Certificate                                    0023000

| Customer : | Object 1 : | SVAN957 SLM |
| --- | --- | --- |
| Cinotech Consultants Limited | Serial No. /Ref. No. : | 23852 / N-08-11 |
| RM 1710, Technology Park, | Object 2 : | Microphone |
| 18 On Lai Street, Shatin, N.T. | Serial No. /Ref. No. : | 35989 |
| Hong Kong | | |
| Customer Code :    SVEC09005 | Manufacturer :    Svantek | |

| Date of calibration: | 19/12/2019 | Certificate No.: | 0023000 |
| --- | --- | --- | --- |
| Date of the recommended re-calibration: | 19/12/2020 | Handle by: | E0002 |

### Measuring results

| Reference value | Indication value | Deviation | Allowed deviation | Object |
| --- | --- | --- | --- | --- |
| 94.0dB | 93.4dB | -0.6dB | +/-  1.5dB | 1 |
| 114.0dB | 113.4dB | -0.6dB | +/-  1.5dB | 1 |

### Measuring equipment

| index | Calibrator / Master | Traceability |
| --- | --- | --- |
| 1 | Master Sound Meter, SVAN949,sn:8571 | IEC61672 |
| 2 | Sound Calibrator, SV30A        sn:32580 | IEC60942 |

### Ambient conditions

Temperature    (20...26)°C                    Humidity    (20...60)%RH

### Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

### Uncertainty

+/-  0.2 dB    for probability not less than 95%.

### Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to  ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) | within | the allowable deviation.

**Performed by**

_____
Calibration Technician

**Approved by**

_____
Quality Manager

Appleone Calibration Laboratory Ltd.      Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR    Tel: +852 2370 4437  Fax: +852 2114 0393

## MSA Hong Kong Ltd.
25/F Jupiter Tower, 9 Jupiter Street, Hong Kong
Tel 852-22587588  Fax 25478780  Email info.hk@msasafety.com  Website www.msasafety.com

Ref.     2020/05/008                                      Date:   22-May-20
Customer   Leighton China State Joint Venture

## CERTIFICATE FOR CALIBRATION CHECK TEST

| Model | Serial No. | Calibration Check Gas | Regulator | Full Scale | Response |
|-------|-----------|----------------------|-----------|-----------|----------|
| | | 1.45% Methane, | | 100% LEL | 29%LEL |
| | | 15% Oxygen | | 30% Vol | 15% O2 |
| Altair 5X | 152097 | 60ppm Carbon Monoxide | .25litre/min | 1999 ppm | 60ppm CO |
| | | 20ppm Hydrogen Sulfide | | 200 ppm | 20ppm H2S |
| | | 2.5% Carbon Dioxide | | 10% Vol | 2.5% CO2 |
| | | 25ppm Ammonia | Demand | 100 ppm | 25ppm NH3 |

Remarks:    Regular inspection completed. Calibration passed
_____
_____
_____

MSA Hong Kong Ltd. certify that instrument/s listed above has/have been calibrated check tested on:
 22-May-20

This instrument was calibrated in accordance with all requirements of the specifications of MSA.

This instrument must be calibration checked prior to use in accordance with the instruction manual.

This instrument was calibrated using NIST traceable equipment and was in accordance with all requirements of the drawings and specifications of MSA.

For and on behalf of
MSA Hong Kong Ltd.

_____
Authorised Signature

# TISCH Environmental

## Certificate of Calibration

### Calibration Certification Information

| | | | | |
| --- | --- | --- | --- | --- |
| **Cal. Date:** | January 17, 2020 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 744.2 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N: 3746** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 2 | 1 | 1.4340 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0180 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9080 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8700 | 8.7 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7150 | 12.6 | 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) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
| --- | --- | --- | --- | --- | --- |
| 0.9849 | 0.6868 | 1.4066 | 0.9957 | 0.6944 | 0.8904 |
| 0.9807 | 0.9633 | 1.9892 | 0.9914 | 0.9739 | 1.2592 |
| 0.9787 | 1.0779 | 2.2240 | 0.9894 | 1.0896 | 1.4078 |
| 0.9776 | 1.1237 | 2.3325 | 0.9883 | 1.1360 | 1.4765 |
| 0.9724 | 1.3601 | 2.8131 | 0.9831 | 1.3749 | 1.7808 |
| **QSTD** m= | 2.09221 | | **QA** m= | 1.31010 | |
| **QSTD** b= | -0.02779 | | **QA** b= | -0.01759 | |
| **QSTD** r= | 0.99994 | | **QA** r= | 0.99994 | |

### Calculations

| | |
| --- | --- |
| **Vstd=** ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** Vstd/ΔTime | **Qa=** Va/ΔTime |

#### For subsequent flow rate calculations:

$$Qstd = 1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$$

$$Qa = 1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$$

### 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

# Cerificate of Calibration - Wind Monitoring Station

| | |
|---|---|
| Description: | <u>Yau Lai Estate, Bik Lai House</u> |
| Manufacturer: | <u>Davis Instruments</u> |
| Model No.: | <u>Davis7440</u> |
| Serial No.: | <u>MC01010A44</u> |
| Equipment No.: | <u>SA-03-04</u> |
| Date of Calibration | <u>21-Aug-2020</u> |
| Next Due Date | <u>21-Feb-2021</u> |

## 1. Performance check of Wind Speed

| Wind Speed, m/s | | Difference D (m/s) |
|---|---|---|
| Wind Speed Reading (V1) | Anemometer Value (V2) | $D = V1 - V2$ |
| 0.0 | 0.0 | 0.0 |
| 1.5 | 1.5 | 0.0 |
| 2.2 | 2.3 | -0.1 |
| 3.5 | 3.4 | 0.1 |
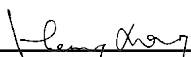
## 2. Performance check of Wind Direction

| Wind Direction ($^{o}$) | | Difference D ($^{o}$) |
|---|---|---|
| Wind Direction Reading (W1) | Marine Compass Value (W2) | $D = W1 - W2$ |
| 0 | 0 | 0.0 |
| 90 | 90 | 0.0 |
| 180 | 180 | 0.0 |
| 270 | 270 | 0.0 |

**Test Specification:**

**1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer**

**2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction**

Calibrated by: _____     Approved by: _____

Wong Shing Kwai                                          Henry Leung

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

| | | | |
|---|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration | 5-Aug-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record | 5-Oct-20 |
| Model No.: | LD-5R | | |
| Serial No.: | 972777 | | |
| Equipment No.: | SA-01-06 | Sensitivity | 0.001 mg/m3 |
| High Volume Sampler No.: | A-01-03 | Before Sensitivity Adjustment | 645 |
| Tisch Calibration Orifice No.: | 3607 | After Sensitivity Adjustment | 645 |

| Calibration of 1 hr TSP | | |
|---|---|---|
| **Calibration Point** | **Laser Dust Monitor**<br>Mass Concentration (μg/m3)<br>**X-axis** | **HVS**<br>Mass concentration (μg/m$^3$)<br>**Y-axis** |
| 1 | 36.0 | 65.8 |
| 2 | 30.0 | 62.7 |
| 3 | 24.0 | 59.0 |
| **Average** | **30.0** | **62.5** |

**By Linear Regression of Y on X**

| | | | |
|---|---|---|---|
| **Slope , mw =** | 0.5667 | **Intercept, bw =** | 45.5000 |
| **Correlation coefficient\* =** | 0.9987 | | |

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler (μg/m$^3$) | 62.5 |
| Particaulate Concentration by Dust Meter (μg/m$^3$) | 30.0 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, (μg/m3) ]** | **2.1** |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____  
Wong Shing Kwai

Approved by: _____  
Henry Leung

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

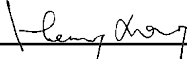| | | | |
|---|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration | 5-Aug-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record | 5-Oct-20 |
| Model No.: | LD-5R | | |
| Serial No.: | 972778 | | |
| Equipment No.: | SA-01-07 | Sensitivity | 0.001 mg/m3 |
| High Volume Sampler No.: | A-01-01A | Before Sensitivity Adjustment | 735 CPM |
| Tisch Calibration Orifice No.: | 3607 | After Sensitivity Adjustment | 735 CPM |

| Calibration of 1 hr TSP | | |
|---|---|---|
| Calibration Point | **Laser Dust Monitor**<br>Mass Concentration (μg/m3)<br>**X-axis** | **HVS**<br>Mass concentration (μg/m$^3$)<br>**Y-axis** |
| 1 | 41.0 | 65.8 |
| 2 | 31.0 | 62.7 |
| 3 | 21.0 | 59.0 |
| **Average** | **31.0** | **62.5** |

**By Linear Regression of Y on X**

| | | | |
|---|---|---|---|
| Slope , mw = | 0.3400 | Intercept, bw = | 51.9600 |
| Correlation coefficient* = | 0.9987 | | |

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler (μg/m$^3$) | 62.5 |
| Particaulate Concentration by Dust Meter (μg/m$^3$) | 31.0 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, (μg/m3) ]** | **2.0** |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung

# Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

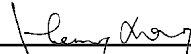| | | | |
|---|---|---|---|
| Description: | Digital Dust Indicator | Date of Calibration | 5-Aug-20 |
| Manufacturer: | Sibata Scientific Technology LTD. | Validity of Calibration Record | 5-Oct-20 |
| Model No.: | LD-5R | | |
| Serial No.: | 972779 | | |
| Equipment No.: | SA-01-08 | Sensitivity | 0.001 mg/m3 |
| High Volume Sampler No.: | A-01-01A | Before Sensitivity Adjustment | 744 CPM |
| Tisch Calibration Orifice No.: | 3607 | After Sensitivity Adjustment | 744 CPM |

| Calibration of 1 hr TSP | | |
|---|---|---|
| Calibration Point | Laser Dust Monitor | HVS |
| | Mass Concentration (μg/m3) **X-axis** | Mass concentration (μg/m$^3$) **Y-axis** |
| 1 | 41.0 | 65.8 |
| 2 | 32.0 | 62.7 |
| 3 | 23.0 | 59.0 |
| **Average** | **32.0** | **62.5** |

**By Linear Regression of Y on X**

Slope , mw = 0.3778        Intercept, bw = 50.4111

Correlation coefficient* = 0.9987

| Set Correlation Factor | |
|---|---|
| Particaulate Concentration by High Volume Sampler (μg/m$^3$) | 62.5 |
| Particaulate Concentration by Dust Meter (μg/m$^3$) | 32.0 |
| Measureing time, (min) | 60.0 |
| Set Correlation Factor , SCF | |
| **SCF = [ K=High Volume Sampler / Dust Meter, (μg/m3) ]** | **2.0** |

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)**

Calibrated by: _____
Wong Shing Kwai

Approved by: _____
Henry Leung