

# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Sheung Wun Yiu (AM1A) Operator: Shum Kam Yuen  
 Cal. Date: 7-Dec-11 Next Due Date: 7-Feb-12  
 Equipment No.: A-001-53T Serial No.: 10216

| Ambient Condition   |       |                     |       |
|---------------------|-------|---------------------|-------|
| Temperature, Ta (K) | 297.5 | Pressure, Pa (mmHg) | 767.8 |

| Orifice Transfer Standard Information |          |   |         |               |          |
|---------------------------------------|----------|---|---------|---------------|----------|
| Serial No:                            | 843      | Slope, mc   | 2.00834 | Intercept, bc | -0.02923 |
| Last Calibration Date:                | 5-Nov-11 | $mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$  |         |               |          |
| Next Calibration Date:                | 5-Nov-12 | $Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$ |         |               |          |

| Calibration of TSP Sampler |                            |   |                                   |                             |  |
|----------------------------|----------------------------|---|-----------------------------------|-----------------------------|--|
| Resistance Plate No.       | Orifice                    |   |                                   | HVS Flow Recorder           |  |
|                            | DH (orifice), in. of water | [DH x (Pa/760) x (298/Ta)] <sup>1/2</sup> | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 9.7                        | 3.13                                      | 1.57                              | 50.0                        | 50.30  |
| 13                         | 6.0                        | 2.46                                      | 1.24                              | 40.0                        | 40.24  |
| 10                         | 4.5                        | 2.13                                      | 1.08                              | 34.0                        | 34.20  |
| 7                          | 3.6                        | 1.91                                      | 0.96                              | 30.0                        | 30.18  |
| 5                          | 2.2                        | 1.49                                      | 0.76                              | 24.0                        | 24.14  |

By Linear Regression of Y on X

Slope, mw = 32.4721 Intercept, bw = -0.6578

Correlation Coefficient\* = 0.9983

\*If Correlation Coefficient < 0.990, check and recalibrate.

#### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 41.31

Remarks: \_\_\_\_\_

QC Reviewer: K. H. SHEK Signature: Mike Date: 8 Dec 11

**AECOM Asia Company Limited**  
**TSP High Volume Sampler**  
**Field Calibration Report**

Station: Shan Tong New Village (AM2) Operator: Shum Kam Yuen  
 Cal. Date: 14-Nov-11 Next Due Date: 14-Jan-12  
 Equipment No.: A-001-29T Serial No.: 10202

| Ambient Condition   |     |                     |       |
|---------------------|-----|---------------------|-------|
| Temperature, Ta (K) | 298 | Pressure, Pa (mmHg) | 762.2 |

| Orifice Transfer Standard Information |           |  |         |               |          |
|---------------------------------------|-----------|--|---------|---------------|----------|
| Serial No:                            | 988       | Slope, mc  | 2.01182 | Intercept, bc | -0.02516 |
| Last Calibration Date:                | 17-May-11 | $mc \times Q_{std} + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$  |         |               |          |
| Next Calibration Date:                | 17-May-12 | $Q_{std} = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$ |         |               |          |

| Calibration of TSP Sampler |                            |   |                                   |                             |  |
|----------------------------|----------------------------|---|-----------------------------------|-----------------------------|--|
| Resistance Plate No.       | Orifice                    |   |                                   | HVS Flow Recorder           |  |
|                            | DH (orifice), in. of water | [DH x (Pa/760) x (298/Ta)] <sup>1/2</sup> | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 10.2                       | 3.20                                      | 1.60                              | 50.0                        | 50.07  |
| 13                         | 7.4                        | 2.72                                      | 1.37                              | 44.0                        | 44.06  |
| 10                         | 5.1                        | 2.26                                      | 1.14                              | 36.0                        | 36.05  |
| 7                          | 3.7                        | 1.93                                      | 0.97                              | 30.0                        | 30.04  |
| 5                          | 2.3                        | 1.52                                      | 0.77                              | 22.0                        | 22.03  |

By Linear Regression of Y on X

Slope, mw = 33.7877 Intercept, bw = -3.0316

Correlation Coefficient\* = 0.9935

\*If Correlation Coefficient < 0.990, check and recalibrate.

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min

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

$$mw \times Q_{std} + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 40.83

Remarks: \_\_\_\_\_

QC Reviewer: K. H. CHEK Signature: Mike Date: 15 Nov 11

# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Shan Tong New Village (AM2) Operator: Shum Kam Yuen  
 Cal. Date: 11-Jan-12 Next Due Date: 11-Mar-12  
 Equipment No.: A-001-29T Serial No.: 10202

| Ambient Condition   |     |                     |       |
|---------------------|-----|---------------------|-------|
| Temperature, Ta (K) | 291 | Pressure, Pa (mmHg) | 766.5 |

| Orifice Transfer Standard Information |           |  |         |               |          |
|---------------------------------------|-----------|--|---------|---------------|----------|
| Serial No:                            | 988       | Slope, mc  | 2.01182 | Intercept, bc | -0.02516 |
| Last Calibration Date:                | 17-May-11 | $mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ |         |               |          |
| Next Calibration Date:                | 17-May-12 | $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$  |         |               |          |

| Calibration of TSP Sampler |                            |  |                                   |                             |  |
|----------------------------|----------------------------|--|-----------------------------------|-----------------------------|--|
| Resistance Plate No.       | Orifice                    |  |                                   | HVS Flow Recorder           |  |
|                            | DH (orifice), in. of water | $[DH \times (Pa/760) \times (298/Ta)]^{1/2}$ | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 10.0                       | 3.21   | 1.61                              | 50.0                        | 50.81  |
| 13                         | 7.2                        | 2.73   | 1.37                              | 42.0                        | 42.68  |
| 10                         | 5.0                        | 2.27   | 1.14                              | 34.0                        | 34.55  |
| 7                          | 3.5                        | 1.90   | 0.96                              | 30.0                        | 30.49  |
| 5                          | 2.4                        | 1.57   | 0.80                              | 24.0                        | 24.39  |

By Linear Regression of Y on X

Slope, mw = 31.9509 Intercept, bw = -0.9412

Correlation Coefficient\* = 0.9958

\*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation  |              |
|--|--------------|
| From the TSP Field Calibration Curve, take Qstd = 1.30m <sup>3</sup> /min                |              |
| From the Regression Equation, the "Y" value according to                                 |              |
| $mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$                       |              |
| Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] <sup>1/2</sup> = | <u>39.94</u> |

Remarks: \_\_\_\_\_

QC Reviewer: Yw Fung

Signature: [Signature]

Date: 12-Jan-12

**AECOM Asia Company Limited**  
**TSP High Volume Sampler**  
**Field Calibration Report**

Station: Riverain Bayside (AM3) Operator: Shum Kam Yuen  
 Cal. Date: 14-Nov-11 Next Due Date: 14-Jan-12  
 Equipment No.: A-001-69T Serial No.: 716

| Ambient Condition   |     |                     |       |
|---------------------|-----|---------------------|-------|
| Temperature, Ta (K) | 298 | Pressure, Pa (mmHg) | 762.2 |

| Orifice Transfer Standard Information |           |  |         |               |          |
|---------------------------------------|-----------|--|---------|---------------|----------|
| Serial No:                            | 988       | Slope, mc  | 2.01182 | Intercept, bc | -0.02516 |
| Last Calibration Date:                | 17-May-11 | $mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ |         |               |          |
| Next Calibration Date:                | 17-May-12 | $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$  |         |               |          |

| Calibration of TSP Sampler |                            |   |                                   |                             |  |
|----------------------------|----------------------------|---|-----------------------------------|-----------------------------|--|
| Resistance Plate No.       | Orifice                    |   |                                   | HVS Flow Recorder           |  |
|                            | DH (orifice), in. of water | [DH x (Pa/760) x (298/Ta)] <sup>1/2</sup> | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 9.8                        | 3.14                                      | 1.57                              | 48.0                        | 48.07  |
| 13                         | 7.7                        | 2.78                                      | 1.39                              | 42.0                        | 42.06  |
| 10                         | 6.0                        | 2.45                                      | 1.23                              | 36.0                        | 36.05  |
| 7                          | 4.3                        | 2.08                                      | 1.04                              | 30.0                        | 30.04  |
| 5                          | 2.4                        | 1.55                                      | 0.78                              | 24.0                        | 24.03  |

**By Linear Regression of Y on X**  
 Slope, mw = 30.9512 Intercept, bw = -1.2430  
 Correlation Coefficient\* = 0.9907  
 \*If Correlation Coefficient < 0.990, check and recalibrate.

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min  
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 38.94

Remarks: \_\_\_\_\_

QC Reviewer: K. H. SHEK Signature: Mike Date: 15 Nov 11



**AECOM Asia Company Limited**  
**TSP High Volume Sampler**  
**Field Calibration Report**

Station: 168 Shek Kwu Lung Village (AM4A) Operator: Choi wing ho  
 Cal. Date: 2-Nov-11 Next Due Date: 3-Jan-12  
 Equipment No.: A-001-70T Serial No.: 10273

| Ambient Condition   |     |                     |       |
|---------------------|-----|---------------------|-------|
| Temperature, Ta (K) | 301 | Pressure, Pa (mmHg) | 759.3 |

| Orifice Transfer Standard Information |          |  |         |               |         |
|---------------------------------------|----------|--|---------|---------------|---------|
| Serial No:                            | 843      | Slope, mc  | 2.00691 | Intercept, bc | -0.0214 |
| Last Calibration Date:                | 8-Nov-10 | $mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ |         |               |         |
| Next Calibration Date:                | 8-Nov-11 | $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$  |         |               |         |

| Calibration of TSP Sampler |                            |   |                                   |                             |  |
|----------------------------|----------------------------|---|-----------------------------------|-----------------------------|--|
| Resistance Plate No.       | Orifice                    |   |                                   | HVS Flow Recorder           |  |
|                            | DH (orifice), in. of water | [DH x (Pa/760) x (298/Ta)] <sup>1/2</sup> | Qstd (m <sup>3</sup> /min) X-axis | Flow Recorder Reading (CFM) | Continuous Flow Recorder Reading IC (CFM) Y-axis |
| 18                         | 10.7                       | 3.25                                      | 1.63                              | 52.0                        | 51.72  |
| 13                         | 8.6                        | 2.92                                      | 1.46                              | 47.0                        | 46.74  |
| 10                         | 5.8                        | 2.40                                      | 1.20                              | 38.0                        | 37.79  |
| 7                          | 4.0                        | 1.99                                      | 1.00                              | 30.0                        | 29.84  |
| 5                          | 2.4                        | 1.54                                      | 0.78                              | 24.0                        | 23.87  |

By Linear Regression of Y on X

Slope, mw = 33.4985 Intercept, bw = -2.7420

Correlation Coefficient\* = 0.9971

\*If Correlation Coefficient < 0.990, check and recalibrate.

| Set Point Calculation   |
|---|
| From the TSP Field Calibration Curve, take Qstd = 1.30m <sup>3</sup> /min                             |
| From the Regression Equation, the "Y" value according to  |
| $mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$                                    |
| Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)] <sup>1/2</sup> = <u>41.03</u> |

Remarks: \_\_\_\_\_

QC Reviewer: K. H. SHEK Signature: Mike Date: 3 Nov 11





TISCH ENVIRONMENTAL, INC.  
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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Nov 08, 2010 Roots-meter S/N 9833620 Ta (K) - 292  
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 754.38

| PLATE OR Run # | VOLUME START (m3) | VOLUME STOP (m3) | DIFF VOLUME (m3) | DIFF TIME (min) | METER DIFF Hg (mm) | ORFICE DIFF H2O (in.) |
|----------------|-------------------|------------------|------------------|-----------------|--------------------|-----------------------|
| 1              | NA                | NA               | 1.00             | 1.4030          | 3.2                | 2.00                  |
| 2              | NA                | NA               | 1.00             | 0.9880          | 6.4                | 4.00                  |
| 3              | NA                | NA               | 1.00             | 0.8850          | 7.9                | 5.00                  |
| 4              | NA                | NA               | 1.00             | 0.8440          | 8.8                | 5.50                  |
| 5              | NA                | NA               | 1.00             | 0.6970          | 12.7               | 8.00                  |

DATA TABULATION

| Vstd                                | (x axis) Qstd | (y axis) | Va                        | (x axis) Qa | (y axis) |
|-------------------------------------|---------------|----------|---------------------------|-------------|----------|
| 1.0087                              | 0.7189        | 1.4234   | 0.9957                    | 0.7097      | 0.8799   |
| 1.0044                              | 1.0166        | 2.0130   | 0.9915                    | 1.0036      | 1.2443   |
| 1.0023                              | 1.1325        | 2.2506   | 0.9894                    | 1.1180      | 1.3912   |
| 1.0012                              | 1.1862        | 2.3604   | 0.9883                    | 1.1710      | 1.4591   |
| 0.9959                              | 1.4289        | 2.8468   | 0.9831                    | 1.4105      | 1.7597   |
| Qstd slope (m) = 2.00691            |               |          | Qa slope (m) = 1.25670    |             |          |
| intercept (b) = -0.02214            |               |          | intercept (b) = -0.01369  |             |          |
| coefficient (r) = 0.99996           |               |          | coefficient (r) = 0.99996 |             |          |
| y axis = SQRT[H2O(Pa/760) (298/Ta)] |               |          | y axis = SQRT[H2O(Ta/Pa)] |             |          |

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

$$Qstd = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Pa}/760) (298/\text{Ta}))] - b \}$$

$$Qa = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Ta}/\text{Pa}))] - b \}$$





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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 17, 2011 Rootsmeter S/N 0438320 Ta (K) - 294  
 Operator Tisch Orifice I.D. - 0988 Pa (mm) - 748.03

| PLATE OR Run # | VOLUME START (m3) | VOLUME STOP (m3) | DIFF VOLUME (m3) | DIFF TIME (min) | METER DIFF Hg (mm) | ORFICE DIFF H2O (in.) |
|----------------|-------------------|------------------|------------------|-----------------|--------------------|-----------------------|
| 1              | NA                | NA               | 1.00             | 1.3900          | 3.2                | 2.00                  |
| 2              | NA                | NA               | 1.00             | 0.9830          | 6.4                | 4.00                  |
| 3              | NA                | NA               | 1.00             | 0.8800          | 7.9                | 5.00                  |
| 4              | NA                | NA               | 1.00             | 0.8380          | 8.8                | 5.50                  |
| 5              | NA                | NA               | 1.00             | 0.6920          | 12.7               | 8.00                  |

DATA TABULATION

| Vstd                                | (x axis) Qstd | (y axis) | Va                        | (x axis) Qa | (y axis) |
|-------------------------------------|---------------|----------|---------------------------|-------------|----------|
| 0.9934                              | 0.7146        | 1.4125   | 0.9957                    | 0.7163      | 0.8866   |
| 0.9891                              | 1.0062        | 1.9976   | 0.9915                    | 1.0086      | 1.2538   |
| 0.9870                              | 1.1216        | 2.2334   | 0.9893                    | 1.1243      | 1.4018   |
| 0.9859                              | 1.1765        | 2.3424   | 0.9882                    | 1.1793      | 1.4703   |
| 0.9807                              | 1.4172        | 2.8251   | 0.9830                    | 1.4205      | 1.7732   |
| Qstd slope (m) = 2.01182            |               |          | Qa slope (m) = 1.25977    |             |          |
| intercept (b) = -0.02516            |               |          | intercept (b) = -0.01579  |             |          |
| coefficient (r) = 0.99999           |               |          | coefficient (r) = 0.99999 |             |          |
| y axis = SQRT[H2O(Pa/760) (298/Ta)] |               |          | y axis = SQRT[H2O(Ta/Pa)] |             |          |

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}  
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}



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AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Nov 15, 2011 Rootmeter S/N 0438320 Ta (K) - 294  
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 748.03

| PLATE OR Run # | VOLUME START (m3) | VOLUME STOP (m3) | DIFF VOLUME (m3) | DIFF TIME (min) | METER DIFF Hg (mm) | ORFICE DIFF H2O (in.) |
|----------------|-------------------|------------------|------------------|-----------------|--------------------|-----------------------|
| 1              | NA                | NA               | 1.00             | 1.3810          | 3.2                | 2.00                  |
| 2              | NA                | NA               | 1.00             | 0.9810          | 6.4                | 4.00                  |
| 3              | NA                | NA               | 1.00             | 0.8760          | 7.8                | 5.00                  |
| 4              | NA                | NA               | 1.00             | 0.8370          | 8.8                | 5.50                  |
| 5              | NA                | NA               | 1.00             | 0.6890          | 12.7               | 8.00                  |

DATA TABULATION

| Vstd                                | (x axis) Qstd | (y axis) | Va                        | (x axis) Qa | (y axis) |
|-------------------------------------|---------------|----------|---------------------------|-------------|----------|
| 0.9934                              | 0.7193        | 1.4125   | 0.9957                    | 0.7210      | 0.8866   |
| 0.9891                              | 1.0083        | 1.9976   | 0.9915                    | 1.0107      | 1.2538   |
| 0.9871                              | 1.1269        | 2.2334   | 0.9895                    | 1.1295      | 1.4018   |
| 0.9859                              | 1.1779        | 2.3424   | 0.9882                    | 1.1807      | 1.4703   |
| 0.9807                              | 1.4233        | 2.8251   | 0.9830                    | 1.4267      | 1.7732   |
| Qstd slope (m) = 2.00834            |               |          | Qa slope (m) = 1.25759    |             |          |
| intercept (b) = -0.02923            |               |          | intercept (b) = -0.01835  |             |          |
| coefficient (r) = 0.99994           |               |          | coefficient (r) = 0.99994 |             |          |
| y axis = SQRT[H2O(Pa/760) (298/Ta)] |               |          | y axis = SQRT[H2O(Ta/Pa)] |             |          |

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}  
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3  
 Equipment No.: A.005.07a  
 Sensitivity Adjustment Scale Setting: 557 CPM

Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 557 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 557 CPM

| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|--------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                          |   |
| 1    | 05-06-11           | 09:30 - 10:30 | 31.3              | 67          | 0.04118  | 1540                     | 25.67                                   |
| 2    | 05-06-11           | 10:30 - 11:30 | 31.3              | 67          | 0.04354  | 1637                     | 27.28                                   |
| 3    | 05-06-11           | 11:30 - 12:30 | 31.3              | 67          | 0.04633  | 1730                     | 28.83                                   |
| 4    | 05-06-11           | 12:30 - 13:30 | 31.4              | 66          | 0.04271  | 1603                     | 26.72                                   |

- Note:
1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
  2. Total Count was logged by Laser Dust Monitor
  3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0016  
 Correlation coefficient: 0.9958

Validity of Calibration Record: 4 June 2012

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 8 June 2011

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3  
 Equipment No.: A.005.08a  
 Sensitivity Adjustment Scale Setting: 702 CPM  
 Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 702 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 702 CPM

| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|--------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                          |   |
| 1    | 02-07-11           | 09:00 - 10:00 | 31.1              | 70          | 0.04313  | 1607                     | 26.78                                   |
| 2    | 02-07-11           | 10:00 - 11:00 | 31.1              | 70          | 0.04137  | 1550                     | 25.83                                   |
| 3    | 02-07-11           | 11:00 - 12:00 | 31.2              | 71          | 0.04552  | 1713                     | 28.55                                   |
| 4    | 02-07-11           | 12:00 - 13:00 | 31.2              | 71          | 0.04736  | 1771                     | 29.51                                   |

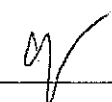
Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®  
 2. Total Count was logged by Laser Dust Monitor  
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0016  
 Correlation coefficient: 0.9949

Validity of Calibration Record: 1 July 2012

Remarks:

QC Reviewer: YW Fung Signature:  Date: 4 July 2011

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3  
 Equipment No.: A.005.09a  
 Sensitivity Adjustment Scale Setting: 797 CPM  
 Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

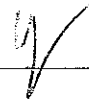
Sensitivity Adjustment Scale Setting (Before Calibration): 797 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 797 CPM

| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|--------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                          |   |
| 1    | 05-06-11           | 13:30 - 14:30 | 31.4              | 66          | 0.04416  | 1758                     | 29.30                                   |
| 2    | 05-06-11           | 14:30 - 15:30 | 31.5              | 66          | 0.04752  | 1889                     | 31.48                                   |
| 3    | 05-06-11           | 15:30 - 16:30 | 31.5              | 66          | 0.04371  | 1748                     | 29.13                                   |
| 4    | 05-06-11           | 16:30 - 17:30 | 31.5              | 67          | 0.04543  | 1808                     | 30.13                                   |

- Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®  
 2. Total Count was logged by Laser Dust Monitor  
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X  
 Slope (K-factor): 0.0015  
 Correlation coefficient: 0.9953  
 Validity of Calibration Record: 4 June 2012

Remarks:

QC Reviewer: YW Fung Signature:  Date: 8 June 2011

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3  
 Equipment No.: A.005.11a  
 Sensitivity Adjustment Scale Setting: 799 CPM  
 Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No.: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 799 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 799 CPM

| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|--------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                          |   |
| 1    | 02-07-11           | 09:30 - 10:30 | 31.1              | 70          | 0.04305  | 1718                     | 28.63                                   |
| 2    | 02-07-11           | 10:30 - 11:30 | 31.1              | 71          | 0.04257  | 1703                     | 28.38                                   |
| 3    | 02-07-11           | 11:30 - 12:30 | 31.2              | 71          | 0.04424  | 1763                     | 29.38                                   |
| 4    | 02-07-11           | 12:30 - 13:30 | 31.2              | 71          | 0.04632  | 1855                     | 30.92                                   |

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®  
 2. Total Count was logged by Laser Dust Monitor  
 3. Count/minute was calculated by (Total Count/60)


By Linear Regression of Y or X

Slope (K-factor): 0.0015  
 Correlation coefficient: 0.9961

Validity of Calibration Record: 1 July 2012

Remarks:

QC Reviewer: YW Fung

Signature: 

Date: 4 July 2011

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3B  
 Equipment No.: A.005.12a  
 Sensitivity Adjustment Scale Setting: 805 CPM  
 Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 805 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 805 CPM

| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total<br>Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|-----------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                             |   |
| 1    | 02-07-11           | 09:30 - 10:30 | 31.1              | 70          | 0.04305  | 1843                        | 30.72                                   |
| 2    | 02-07-11           | 10:30 - 11:30 | 31.1              | 71          | 0.04257  | 1826                        | 30.43                                   |
| 3    | 02-07-11           | 11:30 - 12:30 | 31.2              | 71          | 0.04424  | 1893                        | 31.55                                   |
| 4    | 02-07-11           | 12:30 - 13:30 | 31.2              | 71          | 0.04632  | 1994                        | 33.23                                   |

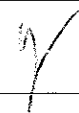
- Note:
1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
  2. Total Count was logged by Laser Dust Monitor
  3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X

Slope (K-factor): 0.0014  
 Correlation coefficient: 0.9947

Validity of Calibration Record: 1 July 2012

Remarks:

QC Reviewer: YW Fung Signature:  Date: 4 July 2011

## EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor  
 Manufacturer/Brand: SIBATA  
 Model No.: LD-3B  
 Equipment No.: A.005.13a  
 Sensitivity Adjustment Scale Setting: 643 CPM

Operator: Mike Shek (MSKM)

### Standard Equipment

Equipment: Rupprecht & Patashnick TEOM®  
 Venue: Cyberport (Pui Ying Secondary School)  
 Model No.: Series 1400AB  
 Serial No: Control: 140AB219899803  
 Sensor: 1200C143659803 K<sub>0</sub>: 12500  
 Last Calibration Date\*: 4 June 2011

\*Remarks: Recommended interval for hardware calibration is 1 year

### Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 643 CPM  
 Sensitivity Adjustment Scale Setting (After Calibration): 643 CPM

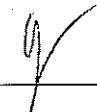
| Hour | Date<br>(dd-mm-yy) | Time          | Ambient Condition |             | Concentration <sup>1</sup><br>(mg/m <sup>3</sup> )<br>Y-axis | Total Count <sup>2</sup> | Count/<br>Minute <sup>3</sup><br>X-axis |
|------|--------------------|---------------|-------------------|-------------|--|--------------------------|---|
|      |                    |               | Temp<br>(°C)      | R.H.<br>(%) |  |                          |   |
| 1    | 05-06-11           | 11:00 - 12:00 | 31.4              | 67          | 0.04513  | 1933                     | 32.21                                   |
| 2    | 05-06-11           | 12:00 - 13:00 | 31.4              | 67          | 0.04392  | 1833                     | 31.38                                   |
| 3    | 05-06-11           | 13:00 - 14:00 | 31.5              | 66          | 0.04751  | 2042                     | 34.03                                   |
| 4    | 05-06-11           | 14:00 - 15:00 | 31.5              | 66          | 0.04476  | 1918                     | 31.97                                   |

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®  
 2. Total Count was logged by Laser Dust Monitor  
 3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X  
 Slope (K-factor): 0.0014  
 Correlation coefficient: 0.9978

Validity of Calibration Record: 4 June 2012

Remarks:

QC Reviewer: YW Fung Signature:  Date: 8 June 2011





## CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0711 01-01 Page 1 of 2

### Item tested

|                       |                            |   |            |
|-----------------------|----------------------------|---|------------|
| Description:          | Sound Level Meter (Type 1) | , | Microphone |
| Manufacturer:         | B & K                      | , | B & K      |
| Type/Model No.:       | 2238                       | , | 4188       |
| Serial/Equipment No.: | 2255677                    | , | 2250455    |
| Adaptors used:        | -                          | , | -          |

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 11-Jul-2011

Date of test: 11-Jul-2011

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 09-May-2012  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 30-May-2012  | CEPREI        |
| Signal generator                | DS 360   | 61227      | 30-May-2012  | CEPREI        |

### Ambient conditions

Temperature: (22 ± 1) °C  
Relative humidity: (55 ± 5) %  
Air pressure: (990 ± 5) hPa

### Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

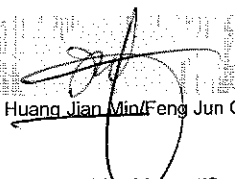
### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

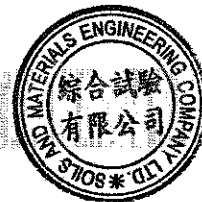
Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Min/Feng Jun Qi

Date: 13-Jul-2011

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0317 06-01 Page 1 of 2

### Item tested

|                       |                            |   |            |
|-----------------------|----------------------------|---|------------|
| Description:          | Sound Level Meter (Type 1) | , | Microphone |
| Manufacturer:         | B & K                      | , | B & K      |
| Type/Model No.:       | 2238                       | , | 4188       |
| Serial/Equipment No.: | 2285692/N.009.04           | , | 2250420    |
| Adaptors used:        | -                          | , | -          |

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of request: 17-Mar-2011

Date of test: 26-Mar-2011

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 10-Jan-2012  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 28-Jun-2011  | CEPREI        |
| Signal generator                | DS 360   | 61227      | 24-Jun-2011  | CEPREI        |

### Ambient conditions

Temperature: (22 ± 1) °C  
Relative humidity: (60 ± 5) %  
Air pressure: (1005 ± 5) hPa

### Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

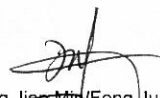
### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

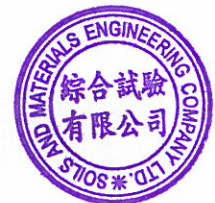
Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Min/Feng Jun Qi

Date: 29-Mar-2011

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0830 02 Page 1 of 2

### Item tested

|                       |                            |                |                |
|-----------------------|----------------------------|----------------|----------------|
| Description:          | Sound Level Meter (Type 1) | Microphone     | Preamp         |
| Manufacturer:         | Rion Co., Ltd.             | Rion Co., Ltd. | Rion Co., Ltd. |
| Type/Model No.:       | NL-31                      | UC-53A         | NH-19          |
| Serial/Equipment No.: | 00320528 / N.007.03A       | 90565          | 75883          |
| Adaptors used:        | -                          | -              | -              |

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 30-Aug-2011

Date of test: 31-Aug-2011

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 09-May-2012  | CIGISMEC      |
| Signal generator                | DS 360   | 33873      | 30-May-2012  | CEPREI        |
| Signal generator                | DS 360   | 61227      | 30-May-2012  | CEPREI        |

### Ambient conditions

Temperature: (23 ± 1) °C  
Relative humidity: (60 ± 5) %  
Air pressure: (1000 ± 5) hPa

### Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of +20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.


### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

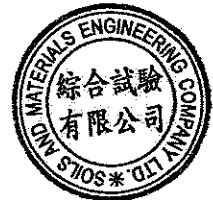
Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Aia/Feng Jun Qi

Date: 31-Aug-2011

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0711 01-05

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Rion Co., Ltd.  
Type/Model No.: NC-73  
Serial/Equipment No.: 10307223 / N.004.08  
Adaptors used: -

### Item submitted by

Customer: AECOM ASIA CO. LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 11-Jul-2011

Date of test: 13-Jul-2011

### Reference equipment used in the calibration

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 2412857    | 18-May-2012  | SCL           |
| Preamplifier            | B&K 2673 | 2239857    | 14-Dec-2011  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 15-Dec-2011  | CEPREI        |
| Signal generator        | DS 360   | 61227      | 30-May-2012  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 09-Dec-2011  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 27-May-2012  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 30-May-2012  | CEPREI        |

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $55 \pm 5$  %  
Air pressure:  $990 \pm 5$  hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

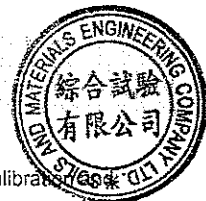
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Huang Jian Min Feng Jun Qi

Date: 13-Jul-2011

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

Certificate No.: 11CA0317 06-02

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Rion Co., Ltd.  
Type/Model No.: NC-73  
Serial/Equipment No.: 10186482/N.004.09  
Adaptors used: -

### Item submitted by

Customer: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of request: 17-Mar-2011

Date of test: 26-Mar-2011

### Reference equipment used in the calibration

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 2412857    | 02-Jul-2011  | SCL           |
| Preamplifier            | B&K 2673 | 2239857    | 14-Dec-2011  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 15-Dec-2011  | CEPREI        |
| Signal generator        | DS 360   | 61227      | 24-Jun-2011  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 09-Dec-2011  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 28-Jun-2011  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 05-Jul-2011  | CEPREI        |

### Ambient conditions

Temperature: 22 ± 1 °C  
Relative humidity: 60 ± 5 %  
Air pressure: 1005 ± 5 hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

  
Huang Jian Min / Feng Jun Qi

Date: 29-Mar-2011

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.