# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## AQUALITY TESTCONSULT LIMITED

11A&B, KAI FONG GARDEN, PING CHE ROAD
FANLING, HONG KONG

**Calibration Laboratory CL-207**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date February 19, 2024

***President***

Visit www.iasonline.org for current accreditation information.

Modify Search Filters

# Search Results

*Showing 1 of 1 Items*

| Accreditation # | Expires | Organization Name | City, State | Country | Program | Status |
|---|---|---|---|---|---|---|
| View Certificate CL-207 | Dec 1, 2025 | **Aquality Testconsult Limited** | Fanling | HK | Calibration Laboratories | Accredited |

For full recognition details, please visit the **About IAS** web page.

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

## AQUALITY TESTCONSULT LIMITED

**Contact Name** Lee Mei Yee, Julia **Contact Phone** +852-56138988

*Accredited to ISO/IEC 17025:2017* *Effective Date February 19, 2024*

**CALIBRATION AND MEASUREMENT CAPABILITY (CMC)***

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| ***Dimensional*** | | | |
| Caliper -Vernier, Dial & Electronic[3] | 0 mm to 300 mm | 30 µm | Checker by Direct method (Based on BS 887:1982, BS 887:2008 |
| Steel Ruler[3] | 1 mm to 1000 mm | 280 µm | Reference Steel Rule by comparison method (Based on BS 4372:1968) |
| Dial Indicator/Gauge (Plunger)[3] | 0 mm to 50 mm | 8 µm | Reference micrometer head by comparison method (Based on BS 907:2008) |
| Feeler Gauge[3] | 0.01 mm to 1 mm | 8 µm | Reference Dial Gauge by Direct method (Based on BS 957: 2008) |
| Measuring tape[3] | 0 m to 5 m | 1200 µm | Reference steel ruler by comparison method (Based on BS 4035:1966) |
| Engineering Square[3] | Length: 0 mm to 160 mm | 20 µm | Reference engineering square and Feeler Gauge by Direct Method (Based on BS 939:2007) |
| Slump cone[3] | Diameter: 0 mm to 200 mm<br>Thickness: ≥1.5 mm<br>Height: 0 mm to 300 mm | 560 µm<br>70 µm<br>560 µm | Reference Caliper & Reference Steel ruler by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified CS1:1990 Vol.1 A4; CS1: 2010 Vol. 1, A5) (BS EN 12350-2: 2009 Cl. 4.1 BS EN 12350-1: 2019 Cl. 4.1.7) |

** If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.*

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| Tamping rod[3] | Diameter: 0 mm to 16 mm<br><br>Length: 600 mm | 50 µm<br><br>290 µm | Reference steel ruler & Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified CS1:1990 Vol.1 A5; CS1: 2010 Vol. 1, A6) (BS EN 12350-2: 2009 Cl. 4.2 ,BS EN 12350-1: 2019 Cl. 4.1.8) |
| Cube mould[3] | (Max dimensions 150 mm per side)<br><br>Dimension<br><br>Flatness<br><br>Perpendicularity<br><br>Parallelism | <br><br>50 µm<br><br>10 µm<br><br>10 µm<br><br>50 µm | Reference Caliper, straight edge & feeler gauge by direct measurement. (Verification in accordance with in-house method for the dimensional requirements as specified in BS1881: Part 108:1983; CS1:1990 Vol1, A21; CS1:2010 Vol 1, A25; BS EN 12390-1:2000 Cl. 5.2.4, BS EN 12390-1: 2012 Cl. 5.2.4, BS EN 12390-1: 2021 Cl. 5.2.2) |
| Compacting Bar[3] | Ramming Face: 25 mm<br><br>Length: 380 mm<br><br>Weight: 1.8 kg | 100 µm<br><br>560 µm<br><br>1 g | Reference Caliper, Steel ruler & Weiging Balance by direct measurement. (Verification in accordance with in-house method for the dimensional & mass requirements as specified in BS 1881: Part 105: 1984 Cl 3.3; CS1: 1990 Vol 2, E3; CS1: 2010 Vol 1 A10; BS EN 12390-2: 2000 Cl 3.3; BS EN 12350-1: 2019 Cl. 4.1.8) |
| Covermeter | 20 mm to 103 mm | 2.9 mm | Reference concrete block (Verification in accordance with in-house method for the dimensional requirements as specified in BS 1881-204:1988 Cl.6.4- Method C) |
| Flow table[3] | Mass<br>15 kg to 17 kg<br>Dimension<br>1 mm up to 71 cm | <br>12 g<br><br>600 µm | Weighing Balance, Reference caliper & Reference steel ruler by direct measurement (Verification in accordance with in-house method for the |

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| | | | dimensional requirements as specified in BS 1881- Part 105: 1984) |
| Test Sieve[3] | 4 mm to 50 mm | 50 µm | Reference Caliper by direct measurement as per BS 410 : 1986 |
| Elongation Gauge[3] | Gap between Pins of Gauge<br>10 mm to 100 mm | 0.29 mm | Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975; BS 812- Part 105.2: 1990) |
| Flakiness Gauge[3] | Length of Slot of Gauge<br>4.9 mm to 33.9 mm | 0.06 mm | Reference Caliper by direct measurement ((Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975;<br>BS 812- Part105.1:1985;<br>BS 812- Part105.1:1989) |
| Riffle Box[3] | Width<br>6 mm to 100 mm | 0.06 mm | Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975) |
| ***Mechanical*** | | | |
| Force Measuring Machine[3] (Compression Mode) | 1 kN to 3000 kN | 0.4 % | Reference Load cell by direct measurement (Based on BS 1610: Part 1:1985; BS 1610: Part 1:1992; BS EN ISO 12390-4:2000 Annex B;<br>BS EN 12390-4: 2019;<br>BS EN ISO 7500-1:2004,<br>BS EN ISO 7500-1: 2015,<br>BS EN ISO 7500-1: 2018) |
| Laser Dust Meter[3] | Dust particles<br>0.1 mg/m$^3$ to 3 mg/m$^3$<br>3 mg/m$^3$ to 8 mg/m$^3$ | <br>0.006 mg/m$^3$<br>0.39 mg/m$^3$ | By comparison method by using reference laser dust meter (Based on ISO 12103-1:2016) |
| Rebound Hammer[3] | 80 unit (hardness) | 1.6 rebound count | Reference Rebound count by comparison method (Based on BS1881: Part 202:1986; BS EN 12504-2:2001; BS EN |

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| | | | 12504-2:2012; BS EN 12504-2:2021) |
| Mass<br>(F2 class and coarser) | 1 g<br>2 g<br>5 g<br>10 g<br>20 g<br>50 g<br>100 g<br>200 g<br>500 g<br>1 kg<br>2 kg<br>5 kg<br>10 kg<br>20 kg<br>50 kg | 0.7 mg<br>0.7 mg<br>0.7 mg<br>0.7 mg<br>0.7 mg<br>0.7 mg<br>0.7 mg<br>0.7 mg<br>0.03 g<br>0.03 g<br>0.03 g<br>0.06 g<br>3.06 g<br>3.06 g<br>6 g | Standard Weight E2/ F1 Class & Weighing Balances by comparison (ABBA) method<br>(Based on OIML-R-111) |
| Weighing Scale & Balance[3] | 0 g to 200 g<br>200 g to 5 kg<br>5 kg to 30 kg<br>30 kg to 50 kg | 0.32 mg<br>12 mg<br>0.75 g<br>3.1 g | Standard weight of E2/F1 Grade by direct measurement<br>(Based on OIML-R-111) |
| Volumetric Glassware | 1 mL to 100 mL<br>100 mL to 1000 mL | 0.004 mL<br>0.09 mL | Standard weight E2 Class, Weighing Balances & Distilled water by gravimetric method<br>(Based on BS 1792: 1982, BS 1797: 1987) |
| ***Thermal*** | | | |
| Digital/Liquid in Glass Thermometers & RTD/ Thermocouples with or without Indicators | 15 °C to 55 °C<br>55 °C to 95 °C | 0.4 °C<br>0.7 °C | Water Baths, Reference Sensor and Indicator by Comparison Method (Based on OIML R133) |
| Curing Tank[3] | (Calibration at 20 °C and at 27 °C @ 30 min)<br><br>20 °C Temperature distribution<br><br>27 °C Temperature distribution<br><br>Efficiency of circulation | <br><br>0.4 °C<br><br>0.4 °C<br><br>5 s | Reference Temperature datalogger by Mapping Method & Reference Stop Watch (Verification in accordance with in-house method for the Temp & Time requirements as specified in BS1881-111:1983, CS1:1990 Vol 1 App A24, CS1:2010 Vol 1 App A28, BE EN 12390-2:2000, BS EN 12390-2: 2019) |
| Oven/Furnace[3] | 40.0 °C to 180.0 °C<br>200.0 °C to 1300 °C | 1.5 °C<br>6 °C | Reference Thermocouple with Indicator By Mapping or Single sensor method<br>(AS 2853:1986) |

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| Water bath[3] | 15 °C to 95 °C | 0.2 °C | Reference Temperature datalogger by Mapping Method (Based on AS 2853:1986) |
| ***Time and Frequency*** | | | |
| Stop Watch/Timer[3] | 0 s to 3600 s<br>0 s to 21600 s (6 hours)<br>0 s to 86400 s (24 hours) | 0.2 s<br>0.6 s<br>0.61 s | Reference stop watch by Direct Method<br>(NIST 960-12 Cl. 4.A.2) |
| Grout Flow Cone[3] | 7 s to 9 s | 0.2 s | Reference stop watch by direct method<br>(Based on ASTM C939-10 Cl.9) |

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

[2]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[3]Also available as site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation

# FAQ / Information

## Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

### Mutual Recognition Arrangement (MRA) Partners for HOKLAS

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) and the Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement (APAC MRA) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click here to view the up-to-date signatories of ILAC and here to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» Mutual Recognition Arrangement (MRA) Partners for HOKLAS

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

### Multilateral Recognition Arrangements (MLA) for HKCAS

### Mutual Recognition Arrangement (MRA) Partners for HKIAS

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Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

| Economy | Logo | Name of Partner | URL | Test Area |
|---|---|---|---|---|
| United States of America | | AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC) | http://www.aihaaccreditedlabs.org/ | Non-medical Testing |
| United States of America | | American Association for Laboratory Accreditation (A2LA) | http://www.a2la.org | Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer |
| United States of America | | ANSI National Accreditation Board (ANAB) | http://www.anab.org/ | Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer |
| United States of America | | International Accreditation Service Inc. (IAS) | http://www.iasonline.org/ | Calibration, Medical Testing, Non-medical Testing |
| United States of America | | National Voluntary Laboratory Accreditation Program (NVLAP) | http://www.nist.gov/nvlap | Calibration, Non-medical Testing |

AQuality 東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
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TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 240818MCA-162F
Date of Report : 22-Aug-24
Page Number : 1 of 3
Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 276004
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 18-Aug-24
Date Calibrated : 18-Aug-24
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 17-Aug-25
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 25.8 °C to 30.3 °C
Relative Humidity : 82 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Coverage Factor K |
|---|---|---|---|---|
| 0.176 | 0.177 | -0.001 | 0.3% | 2.0 |
| 4.832 | 4.873 | -0.041 | 0.8% | 2.0 |
| 8.143 | 8.074 | 0.069 | 0.9% | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
3. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 30% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

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# CERTIFICATE OF CALIBRATION

Report Number : 240818MCA-162F
Date of Report : 22-Aug-24

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

3. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.35 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202401001 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
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EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

| | | |
|---|---|---|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 240818MCA-162F |
| | Date of Issue | 22-Aug-24 |
| | Date of Testing | 18-Aug-24 |
| | Page | 1 of 1 |

## Item for Calibration

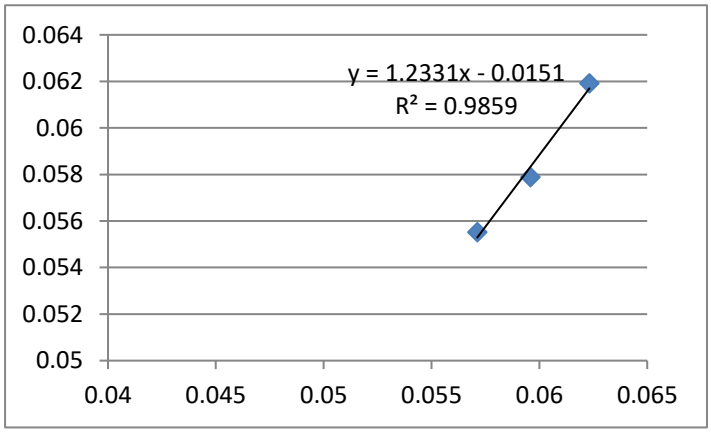
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 276004

## Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 17-AUG-24 / 7-NOV-23

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 18-Aug-24 | 19:00 | 28.1 | 1006.1 | 0.0623 | 0.0619 |
| 18-Aug-24 | 20:05 | 28.1 | 1006.1 | 0.0571 | 0.0555 |
| 18-Aug-24 | 21:10 | 28.1 | 1006.1 | 0.0596 | 0.0579 |

By Linear Regression of Y or X
Slope : 1.2331
Correlation Coefficient : 0.9859
K-Factor : 1.0216
Validity of Calibration : 17-Aug-25




Recorded by : Jessica Liu Signature: Jessica Date: 18-Aug-24

Checked by : S Tang Signature: Tang Date: 18-Aug-24

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# CERTIFICATE OF CALIBRATION

Report Number : 240818MCA-163F
Date of Report : 22-Aug-24
Page Number : 1 of 2
Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 18-Aug-24
Date Calibrated : 18-Aug-24
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 17-Aug-25
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 25.8 °C to 30.3 °C
Relative Humidity : 82 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Coverage Factor K |
|---|---|---|---|---|
| 0.176 | 0.160 | 0.017 | 9.4% | 2.0 |
| 4.832 | 4.776 | 0.057 | 1.2% | 2.0 |
| 8.143 | 8.265 | -0.122 | 1.5% | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

東恒測試顧問有限公司
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# CERTIFICATE OF CALIBRATION

Report Number : 240818MCA-163F
Date of Report : 22-Aug-24

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202401001 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

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# CERTIFICATE OF CALIBRATION

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|---|---|---|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 240818MCA-163F |
| | Date of Issue | 22-Aug-24 |
| | Date of Testing | 18-Aug-24 |
| | Page | 1 of 1 |

**Item for Calibration**

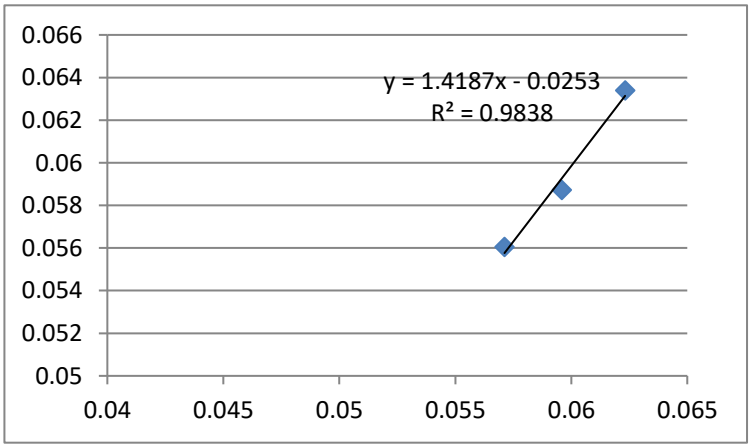
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338

**Standard Equipment**

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 17-AUG-24 / 7-NOV-23

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 18-Aug-24 | 19:00 | 28.1 | 1006.1 | 0.0623 | 0.0634 |
| 18-Aug-24 | 20:05 | 28.1 | 1006.1 | 0.0571 | 0.0561 |
| 18-Aug-24 | 21:10 | 28.1 | 1006.1 | 0.0596 | 0.0587 |

By Linear Regression of Y or X
Slope : 1.4187
Correlation Coefficient : 0.9838
K-Factor : 1.0056
Validity of Calibration : 17-Aug-25




Recorded by : Jessica Liu Signature: Jessica Date: 18-Aug-24

Checked by : S Tang Signature: Tang Date: 18-Aug-24

AQuality 東恒測試顧問有限公司
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Date of Report : 22-Aug-24
Page Number : 1 of 2
Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 476672
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 18-Aug-24
Date Calibrated : 18-Aug-24
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 17-Aug-25
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 25.8 °C to 30.3 °C
Relative Humidity : 82 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Coverage Factor K |
|---|---|---|---|---|
| 0.176 | 0.174 | 0.003 | 1.4% | 2.0 |
| 4.832 | 4.706 | 0.126 | 2.6% | 2.0 |
| 8.143 | 8.245 | -0.102 | 1.3% | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, NEW TERRITORIES, HONG KONG
TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 240818MCA-161F
Date of Report : 22-Aug-24

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202401001 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

| | | |
|---|---|---|
| Apex Testing & Certification Ltd.<br><br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 240818MCA-161F |
| | Date of Issue | 22-Aug-24 |
| | Date of Testing | 18-Aug-24 |
| | Page | 1 of 1 |

## Item for Calibration

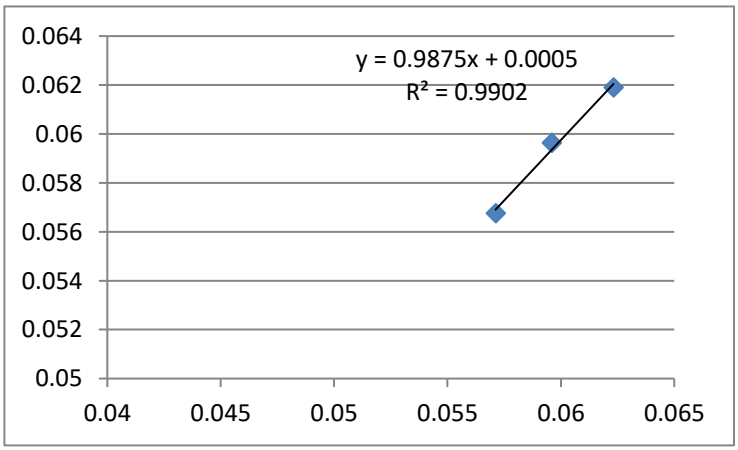
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 476672

## Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 17-AUG-24 / 7-NOV-23

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 18-Aug-24 | 19:00 | 28.1 | 1006.1 | 0.0623 | 0.0619 |
| 18-Aug-24 | 20:05 | 28.1 | 1006.1 | 0.0571 | 0.0568 |
| 18-Aug-24 | 21:10 | 28.1 | 1006.1 | 0.0596 | 0.0596 |

By Linear Regression of Y or X
Slope : 0.9875
Correlation Coefficient : 0.9902
K-Factor : 1.0042
Validity of Calibration : 17-Aug-25




Recorded by : Jessica Liu Signature: Jessica Date: 18-Aug-24

Checked by : S Tang Signature: Tang Date: 18-Aug-24

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM3A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 15-May-25 |
| **Sampler:** TE-5170 | **Serial No:** 4340 | **Tech:** CS Tang |

## Site Conditions

| | |
|---|---|
| **Barometric Pressure (in Hg):** 29.89 | **Corrected Pressure (mm Hg):** 759 |
| **Temperature (deg F):** 83 | **Temperature (deg K):** 301 |
| **Average Press. (in Hg):** 29.89 | **Corrected Average (mm Hg):** 759 |
| **Average Temp. (deg F):** 83 | **Average Temp. (deg K):** 301 |

## Calibration Orifice

| | |
|---|---|
| **Make:** Tisch | **Qstd Slope:** 2.12356 |
| **Model:** TE-5025A | **Qstd Intercept:** -0.05931 |
| **Serial#:** 4088 | **Date Certified:** 15-Oct-24 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.50 | 1.683 | 53.0 | 52.69 |
| 2 | 10.40 | 1.538 | 48.0 | 47.72 |
| 3 | 7.60 | 1.319 | 41.0 | 40.76 |
| 4 | 4.50 | 1.021 | 33.0 | 32.81 |
| 5 | 2.70 | 0.797 | 23.0 | 22.87 |

**Linear Regression**

**Slope:** 32.5214
**Intercept:** -1.9828
**Corr. Coeff:** 0.9966

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.271510093
**Average Flow Calculation in CFM**
44.89702138
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
76.29060557
**Total Flow in CFM**
2693.821283

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM4A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 15-May-25 |
| **Sampler:** TE-5170 | **Serial No:** 3998 | **Tech:** CS Tang |

## Site Conditions

| | | | |
|---|---|---|---|
| **Barometric Pressure (in Hg):** | 29.89 | **Corrected Pressure (mm Hg):** | 759 |
| **Temperature (deg F):** | 83 | **Temperature (deg K):** | 301 |
| **Average Press. (in Hg):** | 29.89 | **Corrected Average (mm Hg):** | 759 |
| **Average Temp. (deg F):** | 83 | **Average Temp. (deg K):** | 301 |

## Calibration Orifice

| | | | |
|---|---|---|---|
| **Make:** | Tisch | **Qstd Slope:** | 2.12356 |
| **Model:** | TE-5025A | **Qstd Intercept:** | -0.05931 |
| **Serial#:** | 4088 | **Date Certified:** | 15-Oct-24 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.70 | 1.696 | 53.0 | 52.69 |
| 2 | 10.30 | 1.530 | 48.0 | 47.72 |
| 3 | 7.40 | 1.301 | 41.0 | 40.76 |
| 4 | 4.30 | 0.999 | 33.0 | 32.81 |
| 5 | 2.40 | 0.753 | 23.0 | 22.87 |

**Linear Regression**

**Slope:** 30.8457
**Intercept:** 0.6260
**Corr. Coeff:** 0.9974

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.256010815
**Average Flow Calculation in CFM**
44.34974188
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
75.3606489
**Total Flow in CFM**
2660.984513

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM5A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 15-May-25 |
| **Sampler:** TE-5170 | **Serial No:** 4344 | **Tech:** CS Tang |

## Site Conditions

| | |
|---|---|
| **Barometric Pressure (in Hg):** 29.89 | **Corrected Pressure (mm Hg):** 759 |
| **Temperature (deg F):** 83 | **Temperature (deg K):** 301 |
| **Average Press. (in Hg):** 29.89 | **Corrected Average (mm Hg):** 759 |
| **Average Temp. (deg F):** 83 | **Average Temp. (deg K):** 301 |

## Calibration Orifice

| | |
|---|---|
| **Make:** Tisch | **Qstd Slope:** 2.12356 |
| **Model:** TE-5025A | **Qstd Intercept:** -0.05931 |
| **Serial#:** 4088 | **Date Certified:** 15-Oct-24 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.50 | 1.683 | 53.0 | 52.69 |
| 2 | 10.30 | 1.530 | 48.0 | 47.72 |
| 3 | 7.20 | 1.284 | 41.0 | 40.76 |
| 4 | 4.50 | 1.021 | 33.0 | 32.81 |
| 5 | 2.60 | 0.783 | 23.0 | 22.87 |

**Linear Regression**

**Slope:** 32.3163
**Intercept:** -1.3596
**Corr. Coeff:** 0.9972

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.260294415
**Average Flow Calculation in CFM**
44.50099579
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
75.6176649
**Total Flow in CFM**
2670.059748

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| October 15, 2025 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | October 15, 2024 | **Rootsmeter S/N:** 438320 | **Ta:** 294 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 752.1 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **4088** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4330 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0260 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9190 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8740 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7230 | 12.7 | 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) |
|---|---|---|---|---|---|
| 0.9988 | 0.6970 | 1.4164 | 0.9957 | 0.6949 | 0.8842 |
| 0.9945 | 0.9693 | 2.0031 | 0.9915 | 0.9664 | 1.2505 |
| 0.9925 | 1.0800 | 2.2395 | 0.9895 | 1.0767 | 1.3980 |
| 0.9913 | 1.1342 | 2.3488 | 0.9883 | 1.1308 | 1.4663 |
| 0.9861 | 1.3639 | 2.8328 | 0.9831 | 1.3598 | 1.7684 |
| **QSTD** | **m=** | **2.12356** | **QA** | **m=** | **1.32974** |
| | **b=** | **-0.05931** | | **b=** | **-0.03702** |
| | **r=** | **0.99996** | | **r=** | **0.99996** |

**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

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华南国家计量测试中心
广东省计量科学研究院
SOUTH CHINA NATIONAL CENTER OF METROLOGY
GUANGDONG INSTITUTE OF METROLOGY

中国认可
国际互认
校准
CALIBRATION
CNAS L0730

# 校 准 证 书

# CALIBRATION CERTIFICATE

证书编号 SXE202411475 第 1 页，共 4 页
Certificate No. Page of

客户名称 上峰检测认证有限公司
Name of the Customer

联络信息 香港荃湾海盛路3号TML广场10楼D6A室
Contact Information

计量器具名称 声校准器
Description

型号/规格 QC-10
Model/Type

制造厂 QUEST
Manufacturer

出厂编号 QI9010183 设备管理编号 ----
Serial No. Equipment No.

接收日期 2024 年 09 月 06 日
Receipt on Y M D

结论 符合JJG 176-2022（1级）技术要求
Conclusion Comply with JJG 176-2022(for Class 1)

校准日期 2024 年 09 月 11 日
Calibration on Y M D

发布日期 2024 年 09 月 11 日
Issue on Y M D

批 准 杨德俊
Authorized by

核 验 李广智
Reviewed by

校 准 何卓斌
Calibrated by

证书专用章
Stamp

扫一扫查真伪

本中心地址：中国广州市广园中路松柏东街30号 邮政编码：510405
电话：(8620)86594172 传真：(8620)86590743 投诉电话：(8620)36611242 E-mail：scm@scm.com.cn
Add: No.30, Songbai East Street, Guangyuan Middle Road, Guangzhou, Guangdong, China
Post Code: 510405 Tel: (8620)86594172 Fax: (8620)86590743 Complaint Tel: (8620)36611242
证书真伪查询：www.scm.com.cn；cert.scm.com.cn Certificate AuthenticityIdentify: www.scm.com.cn; cert.scm.com.cn

# 说　明

证书编号 SXE202411475
Certificate No.

## DIRECTIONS



1. 本中心是国家市场监督管理总局在华南地区设立的国家法定计量检定机构，本中心的质量管理体系符合ISO/IEC 17025:2017标准的要求。
   This laboratory is the National Legal Metrological Verification Institution in southern China set up by the State Administration for Market Regulation. The quality system is in accordance with ISO/IEC 17025:2017.

2. 本中心所出具的数据均可溯源至国家计量基准和/或国际单位制(SI)。
   All data issued by this laboratory are traceable to national primary standards and/or International System of Units (SI).

3. 校准地点、环境条件：
   Location and environmental conditions of the calibration:

| 地点 Location | 声学/振动实验室 Acoustics/Vibration Lab. | 温度 Temperature | (25±1) ℃ | 相对湿度 R.H. | (30～40) % |
|---|---|---|---|---|---|

4. 本次校准的技术依据：
   Reference documents for the calibration:
   JJG 176-2022 声校准器检定规程　V.R. of Sound Calibrators

5. 本次校准所使用的主要计量标准器具：
   Major standards of measurement used in the calibration:

| 设备名称/型号规格/测量范围 Name of Equipment /Model/Type/Range | 编号 Serial No. | 证书号/有效期/溯源单位 Certificate No./Due Date /Traceability to | 计量特性 Metrological Characteristic |
|---|---|---|---|
| 动态信号分析仪 Dynamical Signal Analyzer /3560C（3110模块）/0.1 Hz～200 kHz | 2392397 | SXE202400567 /2025-04-17 /本中心 | 电压:$U_{rel}$=0.2%,频率:$U_{rel}$=0.002%( $k$ =2) Voltage:$U_{rel}$=0.2%,Frequency :$U_{rel}$=0.002%( $k$ =2) |
| 工作标准传声器 Working standard microphone /4190/20 Hz～20 kHz | 2383233 | SXE202400278 /2025-03-04 /本中心 | 20 Hz～4 kHz, $U$=0.20dB 5 kHz～20 kHz, $U$=0.50dB ( $k$ =2) |
| 声校准器 Sound Level Calibrator /4231/94 dB，114 dB | 2730392 | SXE202400209 /2025-02-17 /本中心 | 1 级 Class 1 |

注：1. 本证书校准结果只与受校准仪器有关。The results relate only to the items calibrated.
Note: 2. 未经本机构书面批准，不得部分复制此证书。This certificate shall not be reproduced except in full, without the written approval of our laboratory.
3. “客户名称”、“联络信息”由委托方提供，“制造厂”、“型号规格”、“出厂编号”以及“设备编号”为仪器上标注，委托方对上面内容如有异议，须在收到证书后二十个工作日内提出。
The information **Name of the Customer** and **Contact Information** are provided by client, and the **Manufacturer**, **Model/Type**, **Serial No.** and **Equipment No.** are marked on the items. Client shall submit any objection within 20 working days after receiving the certificate for the information above.

# 校 准 结 果
# RESULTS OF CALIBRATION

证书编号 SXE202411475 Certificate No.　　原始记录号 SXE202411475 Record No.　　第 3 页,共 4 页 Page of

1 外观： 符合要求

Apparent inspection: Pass

2 声压级：见表1

Sound Pressure Level: Shown in table 1

表1 Table 1

| 标称频率/Hz<br>Nominal Frequency | 规定声压级/dB<br>Specified sound pressure level | 测得的声压级/dB<br>Measured sound pressure level | 测得的声压级与规定声压级之差的绝对值/dB<br>absolute value of Error | 接受限/dB<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|---|---|
| 1000 | 114 | 114.07 | 0.07 | 0.25 | 符合要求(Pass) |

3 频率：见表2

Frequency: Shown in table 2

表2 Table 2

| 规定频率/Hz<br>Specified frequency | 标称声压级/dB<br>Nominal sound pressure level | 测得的频率/Hz<br>Measured frequency | 测得的频率与规定频率相对误差的绝对值/%<br>absolute value of Error | 接受限/%<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|---|---|
| 1000 | 114 | 1001.52 | 0.152 | 0.7 | 符合要求(Pass) |

4 总失真+噪声： 见表3

Total distortion + noise: Shown in table 3

表3 Table 3

| 规定频率/Hz<br>Specified frequency | 标称声压级/dB<br>Nominal sound pressure level | 总失真+噪声/%<br>Total Distortion+ noise | 接受限/%<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|---|
| 1000 | 114 | 0.2 | 2.5 | 符合要求(Pass) |

# 校 准 结 果
# RESULTS OF CALIBRATION

证书编号 SXE202411475 原始记录号 SXE202411475 第 4 页,共 4 页
Certificate No. Record No. Page of

说明：

Note:

1 测量结果扩展不确定度：

Expanded uncertainty of measurement results:

声压级：$U$=0.15 dB，频率：$U_{rel}$=0.1%，总失真+噪声：$U$=0.4%，包含因子：$k$=2

Sound Pressure Level , Frequency , Total distortion + noise , Coverage factor

2 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度评定与表示》评定，由合成标准不确定度乘以包含概率约为95%时对应的包含因子$k$得到。

The expanded uncertainty given in this certificate is evaluated according to JJF 1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", which is obtained by multiplying the combined standard uncertainty by the coverage factor $k$ corresponding to the coverage probability of about 95%.

3 校准结果符合性判定依据JJF 1094-2002《测量仪器特性评定》之5.3.1和JJG 176-2005《声校准器检定规程》。

Decision rules of conformity are JJF 1094-2002 *Evaluation of the Characteristics of Measuring Instruments* (5.3.1) and JJG 176-2005 *V.R. of Sound Calibrators*.

4 结论：被校准仪器校准结果符合 JJG 176-2005 (1级)全部后续项目技术要求。

Conclusion: The data of instrument calibrated comply with the technical characteristics of all subsequent items in JJG 176-2005 (for Class 1).

5 该仪器的溯源日期为本证书的"校准日期"，按照所依据技术文件的规定，建议复校时间间隔不超过1年。更换重要部件、维修或对仪器性能有怀疑时，应及时校准。

The traceability date of this instrument is the "Calibration Date" on this certificate, According to the demand of reference document, next calibration is proposed within 1 year. In case of replacement of important parts, maintenance or doubt on the performance of the instrument, it shall be calibrated in time.

6 校准活动中对测量结果有影响的条件：

Conditions under which the calibrations were made that have an influence on the measurement results

温度（Temperature）：（25±1）℃

湿度（Humidity）：（30~40）%RH

静压（Static pressure）：（100.0~101.0）kPa

CTI

中国认可
国际互认
校准
CALIBRATION
CNAS L5102

# 华测计量检测有限公司

## CTI MEASUREMENT AND TESTING CO., LTD.

# 校准证书

## Calibration Certificate

| | | | |
|---|---|---|---|
| 证书编号<br>Certificate No. | C2501141610001 | 第1页共7页<br>Page of | |
| 委托单位<br>Customer | 上峰检测认证有限公司 | | |
| 委托单位地址<br>Address | 香港荃湾海盛路3号TML广场10楼D6A室 | | |
| 器具名称<br>Name of instrument | 声级计 | | |
| 型号规格<br>Model | AWA5661 | | |
| 制造商<br>Manufacturer | 杭州爱华仪器有限公司 | | |
| 出厂编号<br>Serial No. | 341483 | 管理编号<br>Management No. | -------- |
| 接收日期<br>Received date | 2025/01/15 | 校准日期<br>Calibration date | 2025/01/20 |
| 发布日期<br>Issue date | 2025/01/20 | 建议下次校准日期<br>Next calibration date | 2026/01/19 |

华测计量检测有限公司 CTI MEASUREMENT AND TESTING CO., LTD. 校准专用章 Calibration Seal

证书/报告章
Stamp

| | |
|---|---|
| 批准<br>Approved by | 曾财萍 |
| 审核<br>Inspected by | 刘然 |
| 校准<br>Calibrated by | 张翔 |


总部地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋
Headquarter address: Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China
实验室地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋
Laboratory address: Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China
邮编 Post code：518101 电话 Tel.：86-755-33682045 电子邮箱 E-mail：calibration@cti-cert.com

# 说 明

## Directions



1. **本证书校准结果均可溯源至国际单位制（SI）单位。**
The results are traceable to International System of Units(SI).

2. **证书未盖本公司证书/报告章及骑缝章无效。未经本公司书面批准，不得部分复制此证书。**
Any certificate is deemed to be invalid without both the certificate/report seal and its across-page seal. This certificate shall not be copied partly without the written approval.

3. **本证书校准结果只与受校准仪器有关。如证书中的英文内容与中文内容有差异，以中文为准。**
The results relate only to the items calibrated. In case of any discrepancy between the English version and Chinese version of the certificate(if generated), the Chinese version shall prevail.

4. **本次校准的技术依据：**
Reference documents for the calibration
JJG 188-2017 声级计检定规程

5. **校准地点、环境条件：**
Place and environment condition during calibration
地点：本实验室力学室(6)
Place
温度：21.2℃ 相对湿度：41%
Temperature R.H.

计量溯源性声明

6. **本次校准所使用的主要计量标准器具：**
Main mearsurement standards used in the calibration

| 名称/型号规格 Name/Model | 编号 Serial No. | 测量范围 Measurement range | 准确度等级/最大允许误差/不确定度 Accuracy class/Maximum permissible error/Uncertainty | 证书号/溯源机构 Certificate No./Traceability to | 有效期 Due date |
|---|---|---|---|---|---|
| 消声箱 AWA188 | 080312 | 10Hz~20kHz （20~130）dB | $U$=0.8dB,$k$=2 | JL2411712691 深圳市计量质量检测研究院 | 2025/09/09 |
| 测试声源(扬声器) AWA5511A | 090677 | 20Hz~20kHz | 最大声压级:$U$=0.6dB,$k$=2<br>声源稳定性:$U$=0.6dB,$k$=2<br>总失真:$U_{rel}$=2.7%,$k$=2<br>频率响应:$U$=0.6dB,$k$=2 | SXE202401131 广东省计量科学研究院 | 2025/07/16 |
| 信号发生器 AWA1650 | 089943 | 0.5Hz~20kHz | 电压：$U_{rel}$=0.2%,$k$=2<br>频率：$U_{rel}$=0.1%,$k$=2 | SXE202401156 广东省计量科学研究院 | 2025/07/18 |
| 测量放大器 AWA5810D | 089909 | 4Hz~20kHz | 灵敏度：$U$=0.04dB,$k$=2<br>频率计权：$U$=0.2dB,$k$=2<br>线性计权：<br>4Hz ~ 10Hz:$U$=0.11dB,$k$=2<br>10Hz ~ 20kHz:$U$=0.04dB,$k$=2 | SXE202483068 广东省计量科学研究院 | 2025/07/22 |
| 声校准器 4231 | 3014336 | 94dB~114dB | 1级 | SXE202411381 广东省计量科学研究院 | 2025/07/16 |

# 说 明

## Directions

证书编号 C2501141610001
Certificate No.



| 名称/型号规格<br>Name/Model | 编号<br>Serial No. | 测量范围<br>Measurement range | 准确度等级/最大允许误差/不确定度<br>Accuracy class/Maximum permissible error/Uncertainty | 证书号/溯源机构<br>Certificate No./Traceability to | 有效期<br>Due date |
|---|---|---|---|---|---|
| 有源耦合腔<br>AWA6153S+ | 2006409 | 10Hz~400kHz | 声压级:$U$=0.2dB,$k$=2<br>失真度:$U$=0.2%,$k$=2 | SXE202483069<br>广东省计量科学研究院 | 2026/07/22 |
| 声频功率放大器<br>AWA5871 | 080649 | / | $U$=0.03dB,$k$=2 | SXE202401155<br>广东省计量科学研究院 | 2025/07/18 |
| 实验室标准传声器<br>4180 | 3055317 | 10Hz~25000Hz | $U$=(0.05~0.12)dB,$k$=2 | LSsx2024-05614<br>中国计量科学研究院 | 2025/05/15 |

# 校准结果

## Results of calibration

证书编号 C2501141610001
Certificate No.



1. 外观及工作正常性检查
Appearance and function check
正常 Normal

2. 指示声级调整（1000HZ）

| 声级计频率计权 | 声校准器频率 | 声校准器标准值 | 调校前声级计示值 | 调校后声级计示值 | 接受限 | 结论 |
|---|---|---|---|---|---|---|
| | (Hz) | (dB) | (dB) | (dB) | (dB) | Pass/Fail |
| A | 1000 | 94 | 93.9 | / | 93.7 ~ 94.3 | Pass |

3. 频率计权的声信号实验 （频率：1000Hz/A频率计权）

| 声压级标准值 | 声压级指示值 | 接受限 | 结论 |
|---|---|---|---|
| (dB) | (dB) | (dB) | Pass/Fail |
| 44 | 44.5 | 43.2 ~ 44.8 | Pass |
| 54 | 53.9 | 53.2 ~ 54.8 | Pass |
| 64 | 63.8 | 63.2 ~ 64.8 | Pass |
| 74 | 73.8 | 73.2 ~ 74.8 | Pass |
| 84 | 83.8 | 83.2 ~ 84.8 | Pass |
| 94 | 93.7 | 93.2 ~ 94.8 | Pass |
| 104 | 103.8 | 103.2 ~ 104.8 | Pass |
| 114 | 114.2 | 113.2 ~ 114.8 | Pass |

4. 本机自生噪音

| 测试类型 | 频率计权 | 实测值（dB） |
|---|---|---|
| 声信号 | A | 34.8 |
| 电信号 | A | 34.2 |
| | C | 40.2 |
| | Z | 42.5 |

5. 级线性（1dB ~ 10dB内变化）： 起始点指示声级 90 dB

| 频率 | 测量项目 | 实测值 | 接受限 | 结论 |
|---|---|---|---|---|
| (Hz) | ---- | (dB) | (dB) | Pass/Fail |
| 1000 | 起始点以上每间隔10dB最大偏差 | +0.1 | ± 0.3 | Pass |
| | 起始点以下每间隔10dB最大偏差 | +0.2 | ± 0.3 | Pass |
| | 距上限5dB内每隔1dB最大偏差 | 0.0 | ± 0.3 | Pass |
| | 距下限5dB内每隔1dB最大偏差 | +0.2 | ± 0.3 | Pass |
| 8000 | 起始点以上每间隔10dB最大偏差 | +0.1 | ± 0.3 | Pass |
| | 起始点以下每间隔10dB最大偏差 | +0.3 | ± 0.3 | Pass |
| | 距上限5dB内每隔1dB最大偏差 | 0.0 | ± 0.3 | Pass |
| | 距下限5dB内每隔1dB最大偏差 | +0.2 | ± 0.3 | Pass |

# 校准结果

## Results of calibration

证书编号 C2501141610001
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6. 频率计权

| 频率 (Hz) | A计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | -50.5 | -50.6 | -48.5 ~ -52.5 | Pass |
| 31.5 | -39.4 | -39.8 | -37.9 ~ -40.9 | Pass |
| 63 | -26.2 | -26.5 | -25.2 ~ -27.2 | Pass |
| 125 | -16.1 | -16.6 | -15.1 ~ -17.1 | Pass |
| 250 | -8.6 | -8.8 | -7.6 ~ -9.6 | Pass |
| 500 | -3.2 | -3.6 | -2.2 ~ -4.2 | Pass |
| 1000 | 0.0 | 0.0 | +0.7 ~ -0.7 | Pass |
| 2000 | +1.2 | +1.2 | +2.2 ~ +0.2 | Pass |
| 4000 | +1.0 | +1.1 | +2.0 ~ 0.0 | Pass |
| 8000 | -1.1 | -1.2 | +0.4 ~ -3.6 | Pass |
| 16000 | -6.6 | -6.9 | -4.1 ~ -22.6 | Pass |
| 20000 | -9.3 | -10.9 | -6.3 ~ -∞ | Pass |

| 频率 (Hz) | C计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | -6.2 | -6.0 | -4.2 ~ -8.2 | Pass |
| 31.5 | -3.0 | -3.2 | -1.5 ~ -4.5 | Pass |
| 63 | -0.8 | -0.9 | +0.2 ~ -1.8 | Pass |
| 125 | -0.2 | -0.2 | +0.8 ~ -1.2 | Pass |
| 250 | 0.0 | 0.0 | +1.0 ~ -1.0 | Pass |
| 500 | 0.0 | 0.0 | +1.0 ~ -1.0 | Pass |
| 1000 | 0.0 | 0.0 | +0.7 ~ -0.7 | Pass |
| 2000 | -0.2 | -0.1 | +0.8 ~ -1.2 | Pass |
| 4000 | -0.8 | -0.9 | +0.2 ~ -1.8 | Pass |
| 8000 | -3.0 | -3.2 | -1.5 ~ -4.5 | Pass |
| 16000 | -8.5 | -9.2 | -6.0 ~ -24.5 | Pass |
| 20000 | -11.2 | -11.6 | -8.2 ~ -∞ | Pass |

# 校准结果

## Results of calibration

证书编号 C2501141610001
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| 频率 (Hz) | Z计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | 0.0 | −0.1 | +2.0 ~ −2.0 | Pass |
| 31.5 | 0.0 | 0.0 | +1.5 ~ −1.5 | Pass |
| 63 | 0.0 | 0.0 | +1.5 ~ −1.5 | Pass |
| 125 | 0.0 | 0.0 | +1.0 ~ −1.0 | Pass |
| 250 | 0.0 | 0.0 | +1.0 ~ −1.0 | Pass |
| 500 | 0.0 | 0.0 | +1.0 ~ −1.0 | Pass |
| 1000 | 0.0 | 0.0 | +0.7 ~ −0.7 | Pass |
| 2000 | 0.0 | 0.0 | +1.0 ~ −1.0 | Pass |
| 4000 | 0.0 | 0.0 | +1.0 ~ −1.0 | Pass |
| 8000 | 0.0 | −0.2 | +1.5 ~ −2.5 | Pass |
| 16000 | 0.0 | −0.3 | +2.5 ~ −16.0 | Pass |
| 20000 | 0.0 | −0.2 | +3.0 ~ −∞ | Pass |

7. 1kHz处的频率计权

| A计权参考声级 (dB) | C频率计权相对A频率计权的偏差 (dB) | Z频率计权相对A频率计权的偏差 (dB) | 结论 Pass/Fail | 接受限 (dB) |
|---|---|---|---|---|
| 94 | −0.1 | 0.0 | Pass | ± 0.2 |

8. F和S时间计权

| 衰减速率 (dB/s) | 实测值 (dB/s) | 接受限 (dB/s) | 结论 Pass/Fail |
|---|---|---|---|
| 快（F）计权 | 32.2 | 31.0 ~ 38.5 | Pass |
| 慢（S）计权 | 4.9 | 3.6 ~ 5.1 | Pass |

9. 猝发音响应（A计权）

| 猝发音持续时间 (ms) | (LAFmax−LA)标准值 (dB) | (LAFmax−LA)指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 200 | −1.0 | −1.0 | −0.5 ~ −1.5 | Pass |
| 2 | −18.0 | −18.2 | −17.0 ~ −18.5 | Pass |
| 0.25 | −27.0 | −27.1 | −26.0 ~ −30.0 | Pass |
| 猝发音持续时间 (ms) | (LASmax−LA)标准值 (dB) | (LSFmax−LA)指示值 (dB) | 接受限(dB) (dB) | 结论 Pass/Fail |
| 200 | −7.4 | −7.5 | −6.9 ~ −7.9 | Pass |
| 2 | −27.0 | −27.0 | −26.0 ~ −30.0 | Pass |

# 校准结果

## Results of calibration



证书编号 C2501141610001
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注：仪器配传声器型号： AWA14425 ，传声器编号： H-41633
本次校准结果的扩展不确定度为：
Expanded uncertainty of measurement:
声信号：20Hz～200Hz，$U$= 0.5 dB，$k$=2； 250Hz～400Hz，$U$= 0.4 dB，$k$=2； 500Hz～1250Hz，$U$= 0.4 dB，$k$=2； 1600Hz～10000Hz，$U$= 0.6 dB，$k$=2； 12.5kHz~20kHz，$U$= 1.0 dB；
正弦电信号：（0～140）dB，（20～20000）Hz，$U$= 0.3 dB，$k$=2；
猝发音电信号：（0～140）dB，（1000～8000）Hz，(0.25～1000)ms $U$= 0.3 dB，$k$=2；
时间计权 F 和 S： F:(25～40)dB/s，$U$= 3.2 dB/s，$k$=2； S:(1～10)dB/s，$U$= 0.3 dB/s，$k$=2。

备注：
Notes

1. 依据JJF1059.1-2012测量不确定度评定与表示。
   According to JJF1059.1-2012 Evaluation and Expression of Uncertainty in Measurement.
2. 校准项目符合1级技术要求。
   The calibrated measurand are accord with class 1 technical specifications.

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