



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017  
& ANSI/NCSL Z540-1-1994

ATLAS WEATHERING SERVICES GROUP  
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CALIBRATION

Valid To: May 31, 2024

Certificate Number: 0717.04

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1, 3, 7</sup>:

I. Electrical DC/Low Frequency

| Parameter/Equipment   | Range  | CMC <sup>2, 4, 5</sup> (±)   | Comments         |
|-----------------------|--|--|------------------|
| DC Voltage – Generate | Up to 200 mV<br>(0.2 to 2) V<br>(2 to 20) V<br>(20 to 200) V<br>(200 to 1000) V                                | 0.002 %<br>0.001 %<br>0.001 %<br>0.001 %<br>0.001 %                | Transmille 3010A |
| DC Current – Generate | Up to 200 uA<br>(0.2 to 2) mA<br>(2 to 20) mA<br>(20 to 200) mA<br>(0.2 to 2) A<br>(2 to 20) A<br>(20 to 30) A | 0.02 %<br>0.01 %<br>0.01 %<br>0.01 %<br>0.01 %<br>0.03 %<br>0.04 % | Transmille 3010A |

| Parameter/Range       | Frequency   | CMC <sup>2, 4, 5</sup> (±)                     | Comments         |
|-----------------------|---|--|------------------|
| AC Voltage – Generate |   |  |                  |
| 100 nV to 202 mV      | 45 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 100) kHz<br>(100 to 500) kHz                  | 0.03 %<br>0.05 %<br>1.3 %<br>1.3 %             | Transmille 3010A |
| (0.2 to 2) V          | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 100) kHz<br>(100 to 500) kHz | 0.06 %<br>0.03 %<br>0.04 %<br>0.09 %<br>0.40 % |                  |
| (2 to 20) V           | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 100) kHz                     | 0.06 %<br>0.02 %<br>0.03 %<br>0.08 %           |                  |
| (20 to 200) V         | (30 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz<br>(10 to 20) kHz                      | 0.06 %<br>0.03 %<br>0.03 %<br>0.05 %           |                  |
| (200 to 700) V        | (30 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz  | 0.12 %<br>0.04 %<br>0.06 %                     |                  |

| Parameter/Range        | Frequency   | CMC <sup>2, 4, 5</sup> (±) | Comments         |
|------------------------|---|----------------------------|------------------|
| AC Current – Generate  |   |                            |                  |
| Up to 200 uA           | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz  | 0.33 %<br>0.15 %<br>1.1 %  | Transmille 3010A |
| (0.2 to 2) mA          | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz  | 0.19 %<br>0.06 %<br>0.49 % |                  |
| (2 to 20.2) mA         | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz  | 0.19 %<br>0.06 %<br>0.26 % |                  |
| (20 to 202) mA         | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 10) kHz  | 0.19 %<br>0.06 %<br>0.49 % |                  |
| (0.2 to 2.02) A        | (10 to 44) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz   | 0.19 %<br>0.06 %<br>0.49 % |                  |
| (2 to 20) A            | (10 to 44) Hz<br>(45 to 100) Hz<br>(0.1 to 1) kHz | 0.28 %<br>0.08 %<br>0.72 % |                  |
| Capacitance – Generate |   |                            |                  |
| 1 nF<br>10 nF          | 1 kHz   | 2.3 %<br>0.26 %            | Transmille 3010A |

| Parameter/Equipment   | Range            | CMC <sup>2, 4, 5</sup> (±) | Comments         |             |
|-----------------------|------------------|----------------------------|------------------|-------------|
| Resistance – Generate | 0.1 Ω            | 5.8 %                      | Transmille 3010A |             |
|                       | 1 Ω              | 0.58 %                     |                  |             |
|                       | 10 Ω             | 0.06 %                     |                  |             |
|                       | 100 Ω            | 0.01 %                     |                  |             |
|                       | 1 kΩ             | 0.002 %                    |                  |             |
|                       | 10 kΩ            | 0.001 %                    |                  |             |
|                       | 100 kΩ           | 0.002 %                    |                  |             |
| 2 Wire Only           | 1 MΩ             | 0.003 %                    |                  |             |
|                       | 10 MΩ            | 0.01 %                     |                  |             |
|                       | 100 MΩ           | 0.20 %                     |                  |             |
|                       | 1000 MΩ          | 0.001 %                    |                  |             |
| DC Voltage – Measure  | 100 mV to 1000 V | 0.002 %                    |                  | Fluke 8845A |
| Resistance – Measure  | 100 Ω to 100 MΩ  | 0.01 %                     |                  | Fluke 8845A |
| DC Current – Measure  | (-100 to -10) nA | 0.20 %                     |                  | Fluke 8845A |
|                       | 10 nA to 100 μA  | 0.13 %                     |                  |             |
|                       | 100 μA to 10 A   | 0.48 %                     |                  |             |

| Parameter/Range      | Frequency   | CMC <sup>2, 4, 5</sup> (±) | Comments    |
|----------------------|---|----------------------------|-------------|
| AC Current – Measure |   |                            |             |
| 10 mA to 10 A        | 10 Hz to 10 kHz                                       | 0.55 %                     | Fluke 8845A |
| AC Voltage – Measure |   |                            |             |
| 100 mV to 750 V      | 10 Hz to 20 kHz<br>(20 to 50) kHz<br>(100 to 300) kHz | 0.11 %<br>0.29 %<br>0.66 % | Fluke 8845A |

## II. Optical Quantities

| Parameter/Equipment   | Range  | CMC <sup>2, 4, 6</sup> ( $\pm$ )                            | Comments  |
|---|--|---|---|
| Direct Solar Irradiance – Measure<br><br>Secondary Pyrheliometers<br><br>Field Pyrheliometers | <br><br>(0.29 to 3.0) $\mu\text{m}$<br><br>(0.29 to 3.0) $\mu\text{m}$   | <br><br>0.64 %<br><br>0.99 %                                | ASTM E816; ISO 9059<br><br>Eppley AHF primary cavity pyrheliometer<br><br>Basis: 1000 W/m <sup>2</sup> day<br><br>Secondary pyrheliometer<br>Basis: 1000 W/m <sup>2</sup> day |
| Field Pyranometers  | (0.29 to 3.0) $\mu\text{m}$<br><br>Normal Incidence<br>(31 to 45) $^{\circ}$ Tilt  | <br><br>0.54 %<br>1.4 %                                     | ASTM E824; ISO 9847<br><br>Group of reference pyranometers (two or more)<br><br>Basis: 1000 W/m <sup>2</sup> day  |
| Global Solar Irradiance – Measure<br><br>Reference Pyranometers:                              | <br><br>(0.29 to 3.0) $\mu\text{m}$<br><br>Normal Incidence<br>(0 to 45) $^{\circ}$ Tilt   | <br><br>0.40 %<br>0.46 %                                    | ASTM G167; ISO 9846<br><br>Eppley AHF primary cavity pyrheliometer<br><br>Basis: 1000 W/m <sup>2</sup> day  |
| Spectral Irradiance – Measure<br><br>Spectroradiometers<br>(Normal Incidence to Source)       | (0.280 to 0.315) $\mu\text{m}$<br>(0.280 to 0.400) $\mu\text{m}$<br>(0.295 to 0.385) $\mu\text{m}$<br>(0.300 to 0.400) $\mu\text{m}$<br>(0.315 to 0.400) $\mu\text{m}$<br>(0.250 to 0.800) $\mu\text{m}$<br>(0.380 to 1.100) $\mu\text{m}$ | 3.6 %<br>3.6 %<br>3.6 %<br>3.5 %<br>3.5 %<br>3.7 %<br>3.6 % | ASTM G138<br><br>Standard of spectral irradiance (lamp),<br>OL-752-10E  |

| Parameter/Equipment                  | Range   | CMC <sup>2, 4, 6</sup> (±)                | Comments   |
|--------------------------------------|---|---|--|
| Spectral Irradiance – Measure (cont) |   |   |  |
| Reference Ultraviolet Radiometers    | (0.280 to 0.315) μm<br>(0.280 to 0.400) μm<br>(0.295 to 0.385) μm<br>(0.300 to 0.400) μm<br>(0.315 to 0.400) μm | 4.2 %<br>3.7 %<br>3.7 %<br>3.6 %<br>3.9 % | ASTM G130<br>OL 754 Spectroradiometer<br>Basis: 0.2 W/m <sup>2</sup><br>Basis: 70 W/m <sup>2</sup><br>Basis: 60 W/m <sup>2</sup><br>Basis: 70 W/m <sup>2</sup><br>Basis: 70 W/m <sup>2</sup> |
| Field Ultraviolet Radiometer –       |   |   | ASTM E824; ISO 9847<br>(Kipp & Zonen UV-S-AB-T & UV-S-A-T (or other) reference UV radiometers)   |
| UV-B Ultraviolet Radiometers         | (0.280 to 0.315) μm   | 4.2 %                                     | Basis: 0.2 W/m <sup>2</sup>  |
| Total Ultraviolet Radiometers        | (0.295 to 0.385) μm   | 3.7 %                                     | Basis: 60 W/m <sup>2</sup>   |
| UV-A Ultraviolet Radiometers         | (0.300 to 0.400) μm<br>(0.315 to 0.400) μm  | 3.6 %<br>3.9 %                            | Basis: 70 W/m <sup>2</sup><br>Basis: 70 W/m <sup>2</sup>   |

<sup>1</sup> This laboratory offers commercial calibration service.

<sup>2</sup> Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

<sup>3</sup> Calibrations are performed under reasonably controlled conditions of clear skies to minimize atmospheric effects, high solar radiance approaching 1000 W/m<sup>2</sup> to preclude linearity effects and near-normal incidence for all calibrations unless stated otherwise to preclude cosine effects. It should be recognized that the uncertainties associated with the use of carefully calibrated radiometers under the diverse conditions of field use would be significantly higher.

<sup>4</sup> In the statement of CMC, percentages are to be read as a percentage of the reading unless otherwise noted.

<sup>5</sup> The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMC's are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

<sup>6</sup> The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

<sup>7</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.



## Accredited Laboratory

A2LA has accredited

### ATLAS MATERIAL TESTING TECHNOLOGY LLC ATLAS WEATHERING SERVICES GROUP

Phoenix, AZ

for technical competence in the field of

## Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 31<sup>st</sup> day of May 2022.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 0717.04  
Valid to May 31, 2024

*For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.*