SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

LIGHTHOUSE WORLDWIDE SOLUTIONS
300 W Antelope Rd
White City, OR 97503
David Voeller Phone: 541 770 5905

CALIBRATION

Valid To: January 31, 2025 Certificate Number: 4914.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above as well as the satellite laboratories listed below to perform the following calibrations[1, 4]:

I. Optical Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] –			ISO 21501-4
Counting Efficiency	(0.1 to 0.9) µm	3.4 % *CE*	Comparison against a standard particle counter. Uncertainty counting efficiency derived from the formula stated in 21501-4 Annex E
Particle Size	0.1 µm 0.15 µm 0.2 µm 0.25 µm 0.3 µm 0.35 µm 0.4 µm 0.5 µm 0.6 µm 0.7 µm 0.9 µm 1.0 µm 2.0 µm 2.5 µm 3.0 µm	0.002 µm 0.005 µm 0.008 µm 0.006 µm 0.009 µm 0.008 µm 0.010 µm 0.010 µm 0.014 µm 0.008 µm 0.021 µm 0.013 µm 0.008 µm 0.027 µm 0.031 µm	Uncertainty of size setting error derived from the formula stated in ISO 21501-4 Annex E

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] – (cont)			
Particle Size	5.0 µm 10 µm 25 µm	0.031 µm 0.060 µm 0.070 µm	Uncertainty of size setting error derived from the formula stated in ISO 21501-4 Annex E
Size Resolution	(0.24 to 0.7) µm	1.1 % *SR*	Standard reference particles used; Uncertainty of resolution derived from the formula stated in ISO 21501-4 7.3 and Annex E
Flow	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	0.10 L/min 0.24 L/min 0.82 L/min 1.5 L/min 1.6 L/min 2.9 L/min	Uncertainty of flow derived from the formula stated in ISO 21501-4 Annex E
Zero-Count	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	18 Particles/m^3 4 Particles/m^3 2 Particles/m^3 1 Particles/m^3 1 Particles/m^3 1 Particles/m^3	Uncertainty of zero-count is derived from the formula stated in ISO 21501-4 Annex C
Air Samplers, Volumetric –			
Flow	4.0 L/min 10.0 L/min 25.0 L/min 28.3 L/min 100.0 L/min	0.17 L/min 0.27 L/min 0.59 L/min 0.67 L/min 2.2 L/min	Transfer and working standards

SATELLITE LABORATORY

LIGHTHOUSE WORLDWIDE SOLUTIONS
7400 W. Detroit Street, Suite #100
Chandler, AZ 85226
David Voeller Phone: 541 770 5905

I. Optical Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] –			ISO 21501-4
Counting Efficiency	(0.1 to 0.9) µm	3.4 % *CE*	Comparison against a standard particle counter. Uncertainty counting efficiency derived from the formula stated in 21501-4 Annex E
Particle Size	0.1 µm 0.15 µm 0.2 µm 0.25 µm 0.3 µm 0.35 µm 0.4 µm 0.5 µm 0.6 µm 0.7 µm 0.9 µm 1.0 µm 2.0 µm 2.5 µm 3.0 µm 5.0 µm 10 µm 25 µm	0.002 µm 0.005 µm 0.008 µm 0.006 µm 0.009 µm 0.008 µm 0.010 µm 0.010 µm 0.014 µm 0.008 µm 0.021 µm 0.013 µm 0.008 µm 0.027 µm 0.031 µm 0.031 µm 0.060 µm 0.070 µm	Uncertainty of size setting error derived from the formula stated in ISO 21501-4 Annex E

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] – (cont)			
Size Resolution	(0.24 to 0.7) µm	1.1 % *SR*	Standard reference particles used; Uncertainty of resolution derived from the formula stated in ISO 21501-4 7.3 and Annex E
Flow	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	0.10 L/min 0.24 L/min 0.82 L/min 1.5 L/min 1.6 L/min 2.9 L/min	Uncertainty of flow derived from the formula stated in ISO 21501-4 Annex E
Zero-Count	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	18 Particles/m^3 4 Particles/m^3 2 Particles/m^3 1 Particles/m^3 1 Particles/m^3 1 Particles/m^3	Uncertainty of zero-count is derived from the formula stated in ISO 21501-4 Annex C
Air Samplers Volumetric –			
Flow	4.0 L/min 10.0 L/min 25.0 L/min 28.3 L/min 100.0 L/min	0.17 L/min 0.27 L/min 0.59 L/min 0.67 L/min 2.2 L/min	Transfer and working standards

SATELLITE LABORATORY

LIGHTHOUSE WORLDWIDE SOLUTIONS
47509 Seabridge Dr
Fremont, CA 94538
David Voeller Phone: 541 770 5905

I. Optical Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] –			ISO 21501-4
Counting Efficiency	(0.1 to 0.9) µm	3.4 % *CE*	Comparison against a standard particle counter. Uncertainty counting efficiency derived from the formula stated in 21501-4 Annex E
Particle Size	0.1 µm 0.15 µm 0.2 µm 0.25 µm 0.3 µm 0.35 µm 0.4 µm 0.5 µm 0.6 µm 0.7 µm 0.9 µm 1.0 µm 2.0 µm 2.5 µm 3.0 µm 5.0 µm 10 µm 25 µm	0.002 µm 0.005 µm 0.008 µm 0.006 µm 0.009 µm 0.008 µm 0.010 µm 0.010 µm 0.014 µm 0.008 µm 0.021 µm 0.013 µm 0.008 µm 0.027 µm 0.031 µm 0.031 µm 0.060 µm 0.070 µm	Uncertainty of size setting error derived from the formula stated in ISO 21501-4 Annex E

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] – (cont)			
Size Resolution	(0.24 to 0.7) µm	1.1 % *SR*	Standard reference particles used; Uncertainty of resolution derived from the formula stated in ISO 21501-4 7.3 and Annex E
Flow	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	0.10 L/min 0.24 L/min 0.82 L/min 1.5 L/min 1.6 L/min 2.9 L/min	Uncertainty of flow derived from the formula stated in ISO 21501-4 Annex E
Zero-Count	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	18 Particles/m^3 4 Particles/m^3 2 Particles/m^3 1 Particles/m^3 1 Particles/m^3 1 Particles/m^3	Uncertainty of zero-count is derived from the formula stated in ISO 21501-4 Annex C
Air Samplers Volumetric –			
Flow	4.0 L/min 10.0 L/min 25.0 L/min 28.3 L/min 100.0 L/min	0.17 L/min 0.27 L/min 0.59 L/min 0.67 L/min 2.2 L/min	Transfer and working standards

SATELLITE LABORATORY

LIGHTHOUSE WORLDWIDE SOLUTIONS
625 Clark Ave, Unit 16
King Of Prussia, PA 19406
David Voeller Phone: 541 770 5905

I. Optical Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] –			ISO 21501-4
Counting Efficiency	(0.1 to 0.9) µm	3.4 % *CE*	Comparison against a standard particle counter. Uncertainty counting efficiency derived from the formula stated in 21501-4 Annex E
Particle Size	0.1 µm 0.15 µm 0.2 µm 0.25 µm 0.3 µm 0.35 µm 0.4 µm 0.5 µm 0.6 µm 0.7 µm 0.9 µm 1.0 µm 2.0 µm 2.5 µm 3.0 µm 5.0 µm 10 µm 25 µm	0.002 µm 0.005 µm 0.008 µm 0.006 µm 0.009 µm 0.008 µm 0.010 µm 0.010 µm 0.014 µm 0.008 µm 0.021 µm 0.013 µm 0.008 µm 0.027 µm 0.031 µm 0.031 µm 0.060 µm 0.070 µm	Uncertainty of size setting error derived from the formula stated in ISO 21501-4 Annex E

Parameter/Equipment	Range	CMC[2] (±)	Comments
Aerosol Particle Counter[3] – (cont)			
Size Resolution	(0.24 to 0.7) µm	1.1 % *SR*	Standard reference particles used; Uncertainty of resolution derived from the formula stated in ISO 21501-4 7.3 and Annex E
Flow	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	0.10 L/min 0.24 L/min 0.82 L/min 1.5 L/min 1.6 L/min 2.9 L/min	Uncertainty of flow derived from the formula stated in ISO 21501-4 Annex E
Zero-Count	2.83 L/min 14.15 L/min 28.3 L/min 50.0 L/min 56.63 L/min 100.0 L/min	18 Particles/m^3 4 Particles/m^3 2 Particles/m^3 1 Particles/m^3 1 Particles/m^3 1 Particles/m^3	Uncertainty of zero-count is derived from the formula stated in ISO 21501-4 Annex C
Air Samplers Volumetric –			
Flow	4.0 L/min 10.0 L/min 25.0 L/min 28.3 L/min 100.0 L/min	0.17 L/min 0.27 L/min 0.59 L/min 0.67 L/min 2.2 L/min	Transfer and working standards

[1] This laboratory offers commercial calibration service and field calibration service. This accreditation covers calibrations performed at all laboratory locations listed in this scope of accreditation.

[2] 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.

[3] Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

[4] This scope meets A2LA's *P112 Flexible Scope Policy*.

Accredited Laboratory

A2LA has accredited

LIGHTHOUSE WORLDWIDE SOLUTIONS

White City, OR

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 R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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 17th day of March 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4914.01
Valid to January 31, 2025
Revised January 2 , 2024

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