



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

ARTEL LABORATORY
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Westbrook, ME 04092
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CALIBRATION

Valid To: October 31, 2019

Certificate Number: 2093.03

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Optical Radiation

Parameter/Equipment	Range	CMC ² (±)	Comments
Absorbance Ratio/ PCS [®] Calibrator Kit	(0 to 1.5) A (0.98 to 1.02) A/A (%) Cal B Cal C Cal D	0.37 % 0.21 % 0.17 %	Reference spectrophotometer
Absorbance/ MVS [®] Calibrator Plate Solution in Cuvettes (ND Corrected)	<u>520.2 nm</u> Near 0.023 A/A (Cal 1) Near 1.8 A/A (Cal 2) Near 0.4 A/A (Cal 3) Near 1.1 A/A (Cal 4) Near 2.2 A/A (Cal 5) <u>730.5 nm</u> Near 0.05 A/A (Cal 1) Near 0.4 A/A (Cal 2) Near 0.4 A/A (Cal 3) Near 0.4 A/A (Cal 4) Near 0.4 A/A (Cal 5)	<u>520.2 nm</u> 0.0012 A/A 0.0065 A/A 0.0031 A/A 0.0041 A/A 0.0075 A/A <u>730.5 nm</u> 0.0015 A/A 0.0027 A/A 0.0027 A/A 0.0027 A/A 0.0027 A/A	Reference spectrophotometer

Parameter/Equipment	Range	CMC ² (±)	Comments
Absorbance/ MVS [®] and QC Kit Calibrator Plate ND Glass Solution in Cuvettes	<u>520.2 nm</u>	<u>520.2 nm</u>	Reference spectrophotometer
	Near 1.1 A (ND)	0.0026 A	
	Near 0.025 A (Cal 1)	0.0013 A	
	Near 2.0 A (Cal 2)	0.0054 A	
	Near 0.4 A (Cal 3)	0.0020 A	
	Near 1.2 A (Cal 4)	0.0035 A	
	Near 2.4 A (Cal 5)	0.0060 A	
	<u>730.5 nm</u>	<u>730.5 nm</u>	
	Near 0.85 A (ND)	0.0020 A	
	Near 0.04 A (Cal 1)	0.0013 A	
	Near 2.0 A (Cal 2)	0.0021 A	
	Near 0.002 A (Cal 3)	0.0021 A	
	Near 0.002 A (Cal 4)	0.0021 A	
	Near 0.002 A (Cal 5)	0.0021 A	

II. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Volume/ Artel Pipette Calibration System (PCS [®]) Instrument	Near 130 µL Near 250 µL	0.031 µL 0.032 µL	Artel pipette calibration system (PCS [®]) instrument
Volume Determination/ Gravimetric ⁴	(0.1 to 1) µL (>1 to 100) µL (>100 to 700) µL (>700 to 1999) µL (>1999 to 5000) µL	0.0044 µL 0.0045 µL 0.0064 µL 0.035 µL 0.039 µL	ASTM E1154
Syringe Calibration/ Gravimetric	8 µL (10 µL Barrel) 10 µL (10 µL Barrel) 10 µL (50 µL Barrel) 40 µL (50 µL Barrel) 50 µL (50 µL Barrel) 100 µL (250 µL Barrel) 130 µL (250 µL Barrel) 200 µL (250 µL Barrel) 200 µL (500 µL Barrel)	0.0054 µL 0.0057 µL 0.0071 µL 0.014 µL 0.012 µL 0.028 µL 0.038 µL 0.051 µL 0.095 µL	ASTM E1154

Parameter/Equipment	Range	CMC ² (±)	Comments
Volume Determination/ Photometric (PCS®) Instrument ⁴	0.1 µL 0.2 µL 0.5 µL 1.0 µL 2.0 µL 5.0 µL 10.0 µL 20.0 µL 25.0 µL 50.0 µL 100.0 µL 200.0 µL 250.0 µL 300.0 µL 500.0 µL 1000.0 µL 1250.0 µL 2000.0 µL 2500.0 µL 5000.0 µL	0.0005 µL 0.0009 µL 0.0021 µL 0.0038 µL 0.0088 µL 0.019 µL 0.041 µL 0.074 µL 0.091 µL 0.24 µL 0.46 µL 0.67 µL 0.82 µL 0.96 µL 1.6 µL 3.2 µL 4.0 µL 6.9 µL 9.0 µL 22 µL	ISO 8655 Part 7
Pipette Calibration Gravimetric and Photometric (PCS®) Instrument	0.10 µL 0.20 µL 0.50 µL 1.0 µL 2.0 µL 5.0 µL 10.0 µL 20.0 µL 25.0 µL 50.0 µL 100.0 µL 200.0 µL 250.0 µL 300.0 µL 500.0 µL 1000.0 µL 1250.0 µL 2000.0 µL 2500.0 µL 5000.0 µL	0.025 µL 0.027 µL 0.031 µL 0.030 µL 0.046 µL 0.067 µL 0.094 µL 0.14 µL 0.16 µL 0.25 µL 0.46 µL 0.71 µL 0.86 µL 1.0 µL 1.6 µL 3.2 µL 4.0 µL 6.9 µL 9.0 µL 22 µL	NOTE – Gravimetric Calibration per ASTM E 1154 Photometric Calibration Per ISO 8655 Part 7



Parameter/Equipment	Range	CMC ² (±)	Comments
Liquid Handling Systems ³ –			
96 Well Plates – (1 to 96) Channel Devices	(0.1 to 0.2) µL (0.2 to 350) µL	3 % of volume 2 % of volume	Ratiometric photometry per ISO IWA 15, method 6.2.1
384 Well Plates – (1 to 384) Channel Devices	(0.03 to 0.05) µL (0.05 to 55) µL	3.5 % of volume 2.5 % of volume	Implemented using the Artel MVS

¹ This laboratory offers commercial calibration service and calibration service for Artel PCS Instruments and Artel PCS Calibration Kits and syringes.

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 and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. 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 CMC values for Gravimetric and Photometric Volume Determination do not account for uncertainty due to Unit Under Test imprecision (UUT) or Intra-Laboratory variability (repeatability and reproducibility between operators), per clause 5.4, ILAC P-14.



Accredited Laboratory

A2LA has accredited

ARTEL LABORATORY

Westbrook, ME

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSLI Z540-1-1994 and 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 8 January 2009*).



Presented this 29th day of November 2017.

A handwritten signature in blue ink, written over a horizontal line.

Senior Director, Quality and Communications
For the Accreditation Council
Certificate Number 2093.03
Valid to October 31, 2019

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