



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ALPHA TECHNOLOGIES SERVICES, LLC  
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CALIBRATION

Valid To: May 31, 2025

Certificate Number: 2017.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the organization's compliance with A2LA's Calibration Program Requirements) accreditation is granted to this laboratory to perform the following calibrations<sup>1, 8</sup>:

I. Dimensional

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Indicators <sup>3</sup> – Analog	Up to 30 mm	0.00018 mm	ASTM D3767 with gage blocks
Digital	Up to 50.8 mm	0.00018 mm	
Cylinder Barrel Bore Diameter <sup>3</sup>	Up to 12.7 mm	0.0030 mm	ASTM D5099, D1238, D3835 with borescope & master ring
Capillary Die Orifice <sup>3</sup> Diameter –	(1.048 to 2.095) mm	0.0012 mm	ASTM D1238, D3835, D5099 with pin gage & micrometer
Length	(Up to 22.5) mm (>22.5 to 50.8) mm	0.0017 mm 0.0059 mm	
Piston Tip <sup>3</sup> – Outside Diameter	(9.4742 to 19) mm	0.0024 mm	ASTM D1238, D3835 with micrometers

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Piston Tip <sup>3</sup> – (cont)			
Linear Length	6.35 mm	0.034 mm	ASTM D1238, D3835 with micrometers
Thickness Gauge	Up to 3 mm	0.00031 mm	Certified gage blocks
Length Standards <sup>3, 5</sup>	Up to 50 mm	0.0015 mm	Indicator with stand
Outside Diameter <sup>3, 6</sup>	(0.1 to 25) mm	0.00060 mm	ASTM D3767 with micrometer
Angle <sup>3</sup>	(0 to 60)°	0.0064°	Rotary encoder measuring device

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Torque –			
Static (clockwise, counter- clockwise)	(7 to 20) lbf·in (>20 to 40) lbf·in (>40 to 100) lbf·in (>100 to 130) lbf·in	0.0059 lbf·in 0.0071 lbf·in 0.010 lbf·in 0.063 lbf·in	Dead weights & torque arm
Dynamic <sup>3</sup> (clockwise, counter- clockwise)	(7 to 20) lbf·in (>20 to 40) lbf·in (>40 to 100) lbf·in (>100 to 130) lbf·in	0.042 lbf·in 0.060 lbf·in 0.090 lbf·in 0.25 lbf·in	Torque standard
Torque Wrenches	(Up to 80) lbf·in	0.69 lbf·in	Torque wrench tester
Mass	(1 to 10) g (>10 to 100) g (>100 to 220) g (> 220 to 300) g (> 300 to 400) g	0.00012 g 0.00012 g 0.0058 g 0.0058 g 0.0076 g	Modified substitution

Parameter/Equipment	Range	CMC <sup>2, 4, 9</sup> ( $\pm$ )	Comments
Mass (cont)	(> 400 to 500) g (> 500 to 700) g (> 700 to 1000) g (> 1 to 10) kg	0.0094 g 0.0094 g 0.016 g 0.012 kg	Modified substitution
Density	(1.04 to 1.44) g/cm <sup>3</sup> (>1.44 to 1.8) g/cm <sup>3</sup>	0.0011 g/cm <sup>3</sup> 0.00081 g/cm <sup>3</sup>	Precision balance in air & in water or ASTM D792, Method A
Specific Gravity	(1.04 to 1.44) (>1.44 to 1.8)	0.0012 0.00081	Calculated
Density/Specific Gravity Testers <sup>3</sup>	(1.04 to 1.44) g/cm <sup>3</sup> (>1.44 to 1.8) g/cm <sup>3</sup>	0.0011 g/cm <sup>3</sup> + 0.6R 0.00081 g/cm <sup>3</sup> + 0.6R	ASTM D297, Hydrostatic method
	(1.04 to 1.44) (>1.44 to 1.8)	0.0012 + 0.6R 0.00081 + 0.6R	Calculated
Force & Materials Testing Machines <sup>3</sup> –			
Force – Tension & Compression Transducers	(0 to 11) lbf (>11 to 22) lbf	0.0025 lbf 0.0038 lbf	ASTM E4 using deadweights
	(0 to 25) lbf (>25 to 50) lbf	0.029 lbf 0.054 lbf	ASTM E4 using load cells
	(>50 to 100) lbf (>100 to 500) lbf	0.055 lbf 0.64 lbf	
	(>500 to 5000) lbf	0.11 %	
Extensometer	Up to 400 mm	0.31 mm	ASTM E83, calibrated bar
Gage Length	Up to 50.8 mm (>50.8 to 100) mm	0.37 mm 0.52 mm	ASTM E83 using caliper
Crosshead Distance	Up to 500 mm	0.72 mm	Digital position kit
Crosshead Rate	Up to 25 mm/min (>25 to 1000) mm/min	0.38 mm/min 0.24 %	Digital speed/position kit

Parameter/Equipment	Range	CMC <sup>2,4,9</sup> (±)	Comments
Force & Materials Testing Machines <sup>3</sup> –			
Closing Force <sup>3</sup>	Up to 11.1 kN (11.1 to 16) kN	0.055 kN 0.11 kN	Load cell & die
Closing Pressure <sup>3</sup>	(920 to 1200) psi (>1200 to 1732) psi	0.84 % 0.23 %	Calculated from force to pressure
Scales & Balances <sup>3</sup>	(1 to 10) g (> 10 to 220) g (> 220 to 500) g (> 500 to 1000) g (> 1 to 10) kg	0.000035 g 0.0057 g 0.0092 g 0.016 g 0.0057 kg	Standard masses

#### IV. Thermodynamics

Parameter/Equipment	Range	CMC <sup>2,7</sup> (±)	Comments
Temperature –			
Temperature Measure <sup>3</sup>	(55 to 0) °C (0 to 250) °C	0.28 °C 0.088 °C	ASTM D1646, D2084, D5289, D6204, D6601 with temperature probe & meter
Temperature Meters	(0 to 200) °C	0.060 °C	ITS 90, oil bath with SPRT & digital readout
Barrel Temperature <sup>3</sup>	(15 to 425) °C	0.081 °C	ASTM D1238, D3835, with Hart digital PRT

## V. Time & Frequency

Parameter/Equipment	Range	CMC <sup>2, 9</sup> (±)	Comments
Dwell Time	Up to 4 min	0.059 %	ASTM D1646, D2084, D5289, D6204, D6601 with digital stopwatch
	(4 to 15) min	0.019%	
	>15 min to 24 hours	0.011 %	

<sup>1</sup> This laboratory offers commercial calibration and dimensional testing services and field calibration and dimensional testing services where noted.

<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> 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.

<sup>4</sup> In the statement of CMC,  $R$  is the numerical value of the resolution of the device.

<sup>5</sup> This laboratory meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program* for the types of dimensional tests listed above and is considered equivalent to that of a calibration certificate.

<sup>6</sup> This test is not equivalent to a calibration.

<sup>7</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>8</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.

<sup>9</sup> In the statement of CMC, percentages are percentages of reading, unless otherwise indicated.



# Accredited Laboratory

A2LA has accredited

## ALPHA TECHNOLOGIES SERVICES, LLC

*Hudson, OH*

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 18<sup>th</sup> day of May 2023.

A blue ink signature of Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2017.01  
Valid to May 31, 2025

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