



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: September 30, 2026

Certificate Number: 1741.12

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^{1, 8}:

I. Chemical

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
pH Meters ³ – Fixed Points	4 pH 7 pH 10 pH	0.03 pH 0.03 pH 0.04 pH	Standard pH solutions
Conductivity Meters ³	10 µS/cm 100 µS/cm 1000 µS/cm 1413 µS/cm 10 000 µS/cm	0.56 µS/cm 2.2 µS/cm 5.2 µS/cm 4.7 µS/cm 46 µS/cm	Standard conductivity solutions
Refractometers ³	(5, 10, 25, 40, 60) % Brix	0.033 % + 0.6R Brix	Sucrose solutions

II. Dimensional

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
Pin Gage ³ – Class Z & Class ZZ	Up to 1 in	110 µin	Micrometer

Parameter/Equipment	Range	CMC ^{2,5} (\pm)	Comments
Calipers ³	Up to 40 in	$(4.5 + 9.9L) \mu\text{in} + 0.6R$	Gage blocks
Micrometers ³ (Outside & Depth)	Up to 40 in	$(4.5 + 9.9L) \mu\text{in} + 0.6R$	Gage blocks
Inside Micrometers ³	Up to 40 in	$(4.5 + 9.9L) \mu\text{in} + 0.6R$	Gage blocks
Thickness Gages ³	Up to 4 in	$(6.4 + 3.1L) \mu\text{in} + 0.6R$	Gage blocks
Coating Thickness Gages ³	Up to 63 mils	0.1 mils	Coating thickness standards
Cylindrical Measure – Plain Rings	Up to 10 in	$(17 + 4.6L) \mu\text{in}$	P & W Labmaster™ w/ XX master rings
Pins, Plain Plugs, Discs, Spheres – External Diameter	Up to 10 in	$(13 + 2.9L) \mu\text{in}$	P & W Labmaster™ w/ gage blocks
Thread Plugs - Major Diameter	Up to 4 in	$(26 + 3.5L) \mu\text{in}$	P & W Labmaster™ w/ gage blocks
Pitch Diameter	Up to 4 in	$(97 + 0.1L) \mu\text{in}$	
Micrometer End Standards	Up to 12 in	$(13 + 3L) \mu\text{in}$	P & W Labmaster™ w/ gage blocks
Linear Indicators ³ – Dial, test & LVDT	Up to 4 in	$(3.0 + 9.4L) \mu\text{in} + 0.6R$	Gage blocks
Height Gages ³	Up to 20 in (20 to 48) in	$(52 + 7.9L) \mu\text{in} + 0.6R$ $(18 + 9.6L) \mu\text{in} + 0.6R$	Gage blocks

Parameter/Equipment	Range ⁵	CMC ^{2,5} (\pm)	Comments
Steel Rules ³	Up to 72 in Up to 10 in	(1.5 + 10L) μ in + 0.6R 370 μ in	Gage blocks Vision machine
Tape Measures ³	Up to 25 ft	(1.5 + 10L) μ in + 0.6R	Gage blocks
Angle Indicators & Protractors ³	30°, 45°, 60°, 75°, 90°	0.03°	Angle block set
Levels – Bubble & Precision (Vial Sensitivity)	Up to 10 degrees	7 arcsec + 0.6R	Surface plate w/ gage blocks
Feeler/Thickness Gages ³	Up to 1 in	110 μ in	Micrometer
Radius Gages	Up to 2 in	370 μ in	Vision machine
Fixture Gages ³ – Localized Flatness	0.002 in	40 μ in	Dial indicator
Surface Plates ³ – Grades AA, A, & B Repeatability Flatness	0.002 in Up to 60 DL in (> 60 to 120) DL in	40 μ in (31 + 0.2DL) μ in (30 + 0.3DL) μ in	Repeat-o-meter Federal level systems
Optical Comparators ³ – Magnification X – Y Linearity Angle	10 \times to 250 \times Up to 8 in (> 8 to 12) in Up to 90°	0.014 in 160 μ in 270 μ in 0.1°	Grid plate, glass master & scale Angle block set

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Auto Levels – Level (Level Set) Auto Level Compensation Line of sight Horizontal Circle Setting Optical Micrometer Test	Through 360° (-0.2 to 0.2) in	1.3 arcsec 1.3 arcsec 1.2 arcsec 1 arcsec 0.0009 in	Brunson 270BN
Theodolites – Level (Level Test) Reticle Rotation Orientation Horizontal Collimation Vertical Collimation Focus Collimation (Line of Sight) Optical Micrometer Test Trunnion Axis	Through 360° (-0.2 to 0.2) in	1.3 arcsec 1.3 arcsec 1 arcsec 1 arcsec 1.2 arcsec 0.0009 in 1 arcsec	Brunson 270BN
Toolmaker's Microscopes	Up to 2 in	150 μin	Gage blocks

III. Dimensional Testing

Parameter/Equipment	Range	CMC ^{2,9} (±)	Comments
Length – 1D	Up to 10 in	370 μin	Vision machine

IV. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4,6} (±)	Comments		
DC Voltage – Measure ³	Up to 100 mV	7.8 μV/V + 0.2 μV	Fluke 8588A		
	100 mV to 1 V	3.4 μV/V + 0.3 μV			
	(1 to 10) V	3.4 μV/V + 0.5 μV			
	(10 to 100) V	4.7 μV/V + 30 μV	Fluke 80K-6 & DMM		
	(100 to 1000) V	4.8 μV/V + 0.5 mV	Fluke 80K-40 & DMM		
	(1 to 6) kV	1.3 %			
	(6 to 7) kV	2.4 %			
DC Voltage – Generate ³	(0 to 330) mV	25 μV/V + 1 μV	Fluke 5522A		
	(0 to 3.3) V	14 μV/V + 2 μV			
	(0 to 33) V	15 μV/V + 20 μV			
	(30 to 330) V	22 μV/V + 150 μV			
	(100 to 1000) V	22 μV/V + 1.5 mV			
DC Current – Measure ³	(0 to 10) μA	29 μA/A + 0.4 nA	Fluke 8588A		
	(10 to 100) μA	10 μA/A + 0.4 nA			
	(0.1 to 1.0) mA	10 μA/A + 4 nA			
	(1 to 10) mA	15 μA/A + 40 nA			
	(10 to 100) mA	58 μA/A + 1 μA			
	(0.1 to 1.0) A	0.014 % + 0.1mA			
	(1 to 10) A	0.024 % + 0.4 mA			
	(1 to 30) A	0.056 % + 4.4 mA			
	(1 to 50) A	0.31 %	Empo shunt w/ DMM		
DC Current– Generate ³	(0 to 330) μA	0.018 % + 0.02 μA	Fluke 5522A		
	(0 to 3.3) mA	0.012 % + 0.05 μA			
	(0 to 33) mA	0.012 % + 0.25 μA			
	(0 to 330) mA	0.012 % + 2.5 μA			
	(0 to 1.1) A	0.024 % + 40 μA			
	(1.1 to 3) A	0.046 % + 40 μA			
	(0 to 11) A	0.06 % + 500 μA			
	(11 to 21) A	0.12 % + 750 μA			
	Clamp-On Meters ³ – Non-Toroidal	(20.5 to 1000) A		0.65 % + 0.5 A	Fluke 5522A w/5500 coil

Parameter/Equipment	Range	CMC ^{2, 4, 6} (±)	Comments
Resistance – Measure ³	(0 to 1) Ω (1 to 10) Ω (10 to 100) Ω (0.1 to 1) kΩ (1 to 10) kΩ (10 to 100) kΩ (0.1 to 1) MΩ (1 to 10) MΩ (10 to 100) MΩ (0.1 to 1) GΩ (1 to 10) GΩ	19 μΩ/Ω + 4.0 μΩ 11 μΩ/Ω + 14 μΩ 9.6 μΩ/Ω + 50 μΩ 9.4 μΩ/Ω + 0.5 mΩ 9.4 μΩ/Ω + 5.0 mΩ 9.6 μΩ/Ω + 50 mΩ 11 μΩ/Ω + 1 Ω 24 μΩ/Ω + 100 Ω 0.013 % + 10 kΩ 0.14 % + 1 MΩ 0.14 % + 10 MΩ	Fluke 8588A
Resistance – Generate ³	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω 110 Ω to 1.1 kΩ (1.1 to 11) kΩ (11 to 110) kΩ 110 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1100) MΩ	49 μΩ/Ω + 0.001 Ω 37 μΩ/Ω + 0.0015 Ω 34 μΩ/Ω + 0.0014 Ω 34 μΩ/Ω + 0.002 Ω 34 μΩ/Ω + 0.02 Ω 34 μΩ/Ω + 0.2 Ω 39 μΩ/Ω + 2 Ω 73 μΩ/Ω + 30 Ω 0.016 % + 50 Ω 0.03 % + 2.5 kΩ 0.06 % + 3 kΩ 0.36 % + 100 kΩ 1.8 % + 500 kΩ	Fluke 5522A
Insulation Resistance – Generate ³	1 kΩ to 100 MΩ 100 MΩ to 100 GΩ	0.31 % 0.7 %	IET fixed resistor box

Parameter/Equipment	Frequency	CMC ^{2, 4, 6} (±)	Comments
Capacitance – Generate ³ (220 to 399.9) pF (0.4 to 1.0999) nF (1.1 to 3.2999) nF (3.3 to 10.9999) nF (11 to 109.999) nF (110 to 329.999) nF (0.33 to 1.099 99) μF (1.1 to 3.299 99) μF (3.3 to 10.9999) μF (11 to 32.9999) μF (33 to 109.999) μF (110 to 329.999) μF (0.33 to 1.099 99) mF (1.1 to 3.299 99) mF (3.3 to 10.9999) mF (11 to 32.9999) mF (33 to 110) mF	(10 to 10 000) Hz (10 to 10 000) Hz (10 to 3000) Hz (10 to 1000) Hz (10 to 1000) Hz (10 to 1000) Hz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz (10 to 80) Hz (0 to 50) Hz (0 to 20) Hz (0 to 6) Hz (0 to 2) Hz (0 to 0.6) Hz (0 to 0.2) Hz	0.88 % + 10 pF 0.6 % + 0.01 nF 0.6 % + 0.01 nF 0.31 % + 0.1 nF 0.31 % + 0.1 nF 0.31 % + 0.3 nF 0.31 % + 1 nF 0.31 % + 3 nF 0.31 % + 10 nF 0.49 % + 30 nF 0.55 % + 100 nF 0.55 % + 300 nF 0.55 % + 1 μF 0.55 % + 3 μF 0.56 % + 10 μF 0.91 % + 30 μF 1.4 % + 100 μF	Fluke 5522A
AC Voltage – Generate ³ (0 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.096 % + 6 μV 0.022 % + 6 μV 0.026 % + 6 μV 0.12 % + 6 μV 0.42 % + 12 μV 0.96 % + 50 μV 0.036 % + 8 μV 0.018 % + 8 μV 0.02 % + 8 μV 0.042 % + 8 μV 0.096 % + 32 μV 0.24 % + 70 μV 0.036 % + 50 μV 0.019 % + 60 μV 0.023 % + 60 μV 0.036 % + 50 μV 0.084 % + 130 μV 0.29 % + 600 μV 0.036 % + 650 μV 0.019 % + 600 μV 0.029 % + 600 μV 0.042 % + 600 μV 0.11 % + 1.6 mV	Fluke 5522A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate ³ (cont)			
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.023 % + 2 mV 0.025 % + 6 mV 0.03 % + 6 mV 0.036 % + 6 mV 0.24 % + 50 mV	Fluke 5522A
(330 to 1020) V	45 Hz to 10 kHz	0.036 % + 10 mV	
AC Voltage – Measure ³			
(0 to 10) mV	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.034 % + 1.1 μV 0.041 % + 1.1 μV 0.042 % + 1.1 μV 0.031 % + 1.1 μV 1.1 % + 4 μV 2.1 % + 4 μV	Fluke 8588A
(10 to 100) mV	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.01 % + 0.5 μV 0.014 % + 0.4 μV 0.024 % + 1 μV 0.054 % + 5 μV 0.22 % + 30 μV 1.2 % + 0.1 mV	
(0.1 to 1) V	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.008 % + 5 μV 0.013 % + 5 μV 0.024 % + 10 μV 0.054 % + 50 μV 0.22 % + 0.3 mV 1.1 % + 1 mV	
(1 to 10) V	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.008 % + 50 μV 0.013 % + 50 μV 0.024 % + 0.1 mV 0.054 % + 0.5 mV 0.22 % + 3 mV 1.1 % + 10 mV	
(10 to 100) V	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.016 % + 0.5mV 0.017 % + 0.5mV 0.027 % + 1 mV 0.061 % + 5 mV 0.38 % + 50 mV 1.2 % + 0.5 V	

Parameter/Range	Frequency	CMC ^{2, 4, 6} (±)	Comments
AC Voltage – Measure ³ (cont)			
(100 to 1000) V	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.012 % + 25 mV 0.012 % + 25 mV 0.025 % + 25 mV 0.06 % + 0.1 V	Fluke 8588A
(1 to 6) kV	(50 to 60) Hz	1.6 %	DMM with Fluke 80K6 HH probe
(6 to 10) kV	(50 to 60) Hz	6 %	DMM with Fluke 80K40 HV probe
AC Current – Generate ³			
(0 to 0.33) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.24 % + 0.1 μA 0.18 % + 0.1 μA 0.15 % + 0.1 μA 0.36 % + 0.15 μA 0.96 % + 0.2 μA 2 % + 0.4 μA	Fluke 5522A
(0.33 to 3.3) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.24 % + 0.15 μA 0.16 % + 0.15 μA 0.13 % + 0.15 μA 0.25 % + 0.2 μA 0.6 % + 0.3 μA 1.2 % + 0.6 μA	
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.22 % + 2 μA 0.11 % + 2 μA 0.05 % + 2 μA 0.097 % + 2 μA 0.24 % + 3 μA 0.48 % + 4 μA	
(33 to 330) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.22 % + 20 μA 0.11 % + 20 μA 0.05 % + 20 μA 0.12 % + 50 μA 0.24 % + 100 μA 0.48 % + 200 μA	

Parameter/Range	Frequency	CMC ^{2, 4, 7} (±)	Comments
AC Current – Generate ³ (cont)			
(0.33 to 1.1) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.22 % + 100 µA 0.06 % + 100 µA 0.72 % + 1 mA 3 % + 5 mA	Fluke 5522A
(1.1 to 3) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.22 % + 100 µA 0.073 % + 100 µA 0.72 % + 1 mA 3 % + 5 mA	
(3 to 11) A	45 Hz to 1 kHz (1 to 5) kHz	0.12 % + 2 mA 3.6 % + 2 mA	
(11 to 20.5) A	45 Hz to 1 kHz (1 to 5) kHz	0.18 % + 5 mA 3.6 % + 5 mA	
Clamp-On Meters ³ – (10 to 150) A			
Toroidal	(45 to 65) Hz (65 to 440) Hz	0.49 % + 0.025 A 1 % + 0.027 A	Fluke 5522A w/ 5500 coil
Non-Toroidal	(45 to 65) Hz (65 to 440) Hz	0.76 % + 0.25 A 1.3 % + 0.25 A	
(150 to 1025) A			
Toroidal	(45 to 65) Hz (65 to 440) Hz	0.49 % + 0.09 A 1 % + 0.1 A	
Non-Toroidal	(45 to 65) Hz (65 to 440) Hz	0.76 % + 0.9 A 1.3 % + 0.9 A	

Parameter/Range	Frequency	CMC ^{2, 4, 7} (±)	Comments
AC Current – Measure ³			
(0 to 10) µA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.21 % + 2.5 nA 0.21 % + 2.5 nA 0.21 % + 2.5 nA	Fluke 8588A
(10 to 100) µA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.029 % + 5 nA 0.054 % + 5 nA 0.075 % + 5 nA 0.41 % + 10 nA	
(0.1 to 1) mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.029 % + 50 nA 0.054 % + 50 nA 0.075 % + 50 nA 0.41 % + 0.1 µA	
(1 to 10) mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.029 % + 0.5 µA 0.054 % + 0.5 µA 0.075 % + 0.5 µA 0.41 % + 1 µA	
(10 to 100) mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.029 % + 5 µA 0.053 % + 5 µA 0.075 % + 5 µA	
(0.1 to 1) A	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.031 % + 0.1 mA 0.056 % + 0.1 mA 0.08 % + 0.1 mA	
(1 to 10) A	10 Hz to 2 kHz (2 to 10) kHz	0.085 % + 0.5 mA 0.085 % + 0.5 mA	
(10 to 30) A	10 Hz to 2 kHz (2 to 10) kHz	0.085 % + 12 mA 0.13 % + 12 mA	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Thermocouple Simulation & Measure ³ –			
Type B	(600 to 800) °C (800 to 1820) °C	0.53 °C 0.43 °C	Fluke 5522A
Type E	(-250 to -100) °C (-100 to 650) °C (650 to 1000) °C	0.61 °C 0.21 °C 0.26 °C	
Type J	(-210 to -100) °C (-100 to 760) °C (760 to 1200) °C	0.33 °C 0.21 °C 0.28 °C	
Type K	(-200 to -100) °C (-100 to 1000) °C (1000 to 1372) °C	0.40 °C 0.32 °C 0.48 °C	
Type N	(-200 to -100) °C (-100 to 410) °C (410 to 1300) °C	0.50 °C 0.29 °C 0.35 °C	
Type R	(0 to 250) °C (250 to 1000) °C (1000 to 1767) °C	0.70 °C 0.42 °C 0.50 °C	
Type S	(0 to 250) °C (250 to 1400) °C (1400 to 1767) °C	0.58 °C 0.46 °C 0.57 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 400) °C	0.76 °C 0.30 °C 0.21 °C	
Electrical Calibration of RTD's ³ –			
Generate	(-200 to 200) °C (200 to 600) °C (600 to 850) °C	0.19 °C 0.31 °C 0.43 °C	Beamex MC2-MF
Measure	(-200 to 200) °C (200 to 600) °C (600 to 850) °C	0.19 °C 0.31 °C 0.43 °C	

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
Oscilloscopes ³ – Square Wave Signal: 50 Ω Load @ 1 kHz 1 MΩ Load @ 1 kHz DC Volt Amplitude: 50 Ω Load 1 MΩ Load Level Sine Wave: Frequency Amplitude Flatness (Bandwidth) Time Markers: Into a 50 Ω Load Rise Time: 1 kHz to 2 MHz (2 to 10) MHz	 1 mV to 6.6 V _{pk-pk} 1 mV to 130 V _{pk-pk} (0 to 6.6) V (0 to 130) V Up to 1100 MHz 50 kHz Reference 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (300 to 1100) MHz Up to 100 MHz (100 to 300) MHz (300 to 600) MHz (300 to 1100) MHz 5 s to 50 ms 20 ms to 2 ns ≤ 300 ps ≤ 350 ps	 0.31 % + 40 μV 0.14 % + 40 μV 0.3 % + 40 μV 0.06 % + 40 μV 3.3 μHz/Hz 2.4 % + 300 μV 4.2 % + 300 μV 4.8 % + 300 μV 7.2 % + 300 μV 8.4 % + 300 μV 1.8 % + 100 μV 2.4 % + 100 μV 4.8 % + 100 μV 6 % + 100 μV (30 + 1000 <i>t</i>) μs/s 3.5 μs/s 130 ps 130 ps	 Fluke 5522A w/ SC1100

V. Fluid Quantities

Parameter/Equipment	Range	CMC ^{2, 5, 6} (±)	Comments
Fume Hoods – Air Velocity Only ³	(20 to 100) ft/min (100 to 200) ft/min	5.2 ft/min 4.1 %	Anemometer
Viscosity Meters ³	1 cP 5 cP 50 cP 100 cP 500 cP	0.2 % + 0.6 <i>R</i> 0.2 % + 0.6 <i>R</i> 0.26 % + 0.6 <i>R</i> 0.26 % + 0.6 <i>R</i> 0.32 % + 0.6 <i>R</i>	Standard viscosity solutions w/ bath

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Volumetric Apparatus – (Cylinders, Flasks, Beakers, Vessels)	(10 to 600) mL	0.036 mL	Gravimetric method
	(> 600 to 3000) mL	0.8 mL	

VI. Mechanical

Parameter/Equipment	Range	CMC ^{2,5,6,7} (±)	Comments	
Scales & Balances ³	(1 to 500) mg	0.013 mg + 0.6R	ASTM Class 1 weights (applied load)	
	Up to 5 g	0.043 mg + 0.6R		
	Up to 10 g	0.062 mg + 0.6R		
	Up to 30 g	0.096 mg + 0.6R		
	Up to 50 g	0.17 mg + 0.6R		
	Up to 100 g	0.31 mg + 0.6R		
	Up to 200 g	0.63 mg + 0.6R		
	Up to 300 g	0.92 mg + 0.6R		
	Up to 500 g	1.5 mg + 0.6R		
	Up to 1000 g	3.1 mg + 0.6R		
	(> 1 to 35) kg	3.1 mg per 1000 g + 0.6R	Class F weights (applied load)	
	(5 to 10) g	0.04 % + 0.6R		
	(10 to 500) g	0.025 % + 0.6R		
	501 g to 20 kg	0.017 % + 0.6R		
	(> 20 to 5000) kg	0.017 % per 20 kg + 0.6R	Class F weights (applied load)	
	Up to 1000 lb	0.017 % + 0.6R		
Force – Measure & Measuring Equipment ³	(1000 to 120 000) lb	0.017 % per 1000 lb + 0.6R	Class F weights (applied load)	
	Up to 1000 lbf	0.017 % + 0.6R		
	Up to 10 000 lbf	0.14 % of Applied	Load cells w/ indicator	
Tensile Tester ³ –				
	Speed / Rate	Up 50 in/min		0.025 %
	Displacement	Up to 20 Inches	0.000 25 in	Timer & caliper Gage blocks w/ indicator

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments
Torque – Measure ³ – Wrenches – Click, Dial, Adjustable, Screwdrivers	5 lbf·in to 600 lbf·ft	0.65 %	CDI Suretest 5000- ST
Rotary Torque– Measure ³ – Pneumatic, DC, Pulse	(0 to 180) N·m	1.3 % Full Scale	Crane-Torquestar w/ rotary transducers
Pressure – Measure & Measuring Equipment ³			
Pneumatic	(0 to 1) in·H ₂ O	0.002 in·H ₂ O	Heise HM2-1
	(0 to 4) in·H ₂ O	0.025 in·H ₂ O	Dwyer 475
	(0.01 to 30) psig	0.021 psi	Beamex MC2-MF
	Up to 300 psig	0.09 psi + 0.025 %	Beamex MC2-MF w/EXT20C
Hydraulic	(30 to 300) psig	0.21 psi	Druck DPI-104
	(300 to 1000) psig	0.7 psi	
	(1000 to 10 000) psig	7 psi	
	Up to 100 psig	0.05 %	Deadweight tester
	(> 100 to 10 000) psig	0.06 %	
Atmospheric Pressure – Measure & Measuring Equipment (Vacuum) ³	(0.01 to 28.5) in·Hg	0.02 in·Hg	Beamex MC2- IPM2C
	Up to 10 Torr	0.7 % + 0.001 Torr	MKS pressure transducers
	(10 to 100) Torr	0.64 % + 0.01 Torr	
Speed – Measure ³			
Optic/Non-contact: RPM Totalizer/Rate Meters	(6 to 100 000) rpm (2 to 3300) fpm	0.017 % 0.017 %	Monarch PLT200
Contact: RPM Totalizer/Rate Meters	(6 to 20 000) rpm (2 to 3300) fpm	0.22 % 0.22 %	Shimpo 105A

Parameter/Equipment	Range	CMC ^{2,5,6} (±)	Comments
Totalize Meters – Distance Measure Mechanical Counter/Totalizers ³	Up to 200 ft Up to 999 999 counts	0.64 % 0.02 % + 0.6R	Monarch PLT200 w/ 10cm wheel
Speed/RPM– Measuring Equipment	(2.5 to 100 000) RPM	0.000 24 % + 0.6R	Keysight 33500B

VII. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Relative Humidity – Measure ³	(10 to 80) % RH	1.5 % RH	Rotronic HP22A w/ HC2 Probe
Temperature – Measure ³	(-196 to 420) °C	0.06 °C	Fluke 1524 w/5615-12 Probe
Temperature – Measuring Equipment ³	(-45 to 140) °C (-15 to 350) °C	0.18 °C 0.15 °C	Fluke 9170 Fluke 9009 w/ Ext Probe
Infrared Thermometry – Measuring Equipment ³	35 °C (35 to 100) °C (100 to 200) °C (200 to 350) °C (350 to 500) °C	0.86 °C 1 °C 1.2 °C 1.7 °C 2.3 °C	Fluke 4181 Spectral band (8 to 14) μm Emissivity 0.95

VIII. Time & Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Timers & Stopwatches ³	(1 to 3600) s	0.2 s	Monarch PLT 200
Frequency – Measure ³	Up to 350 MHz	0.06 µHz/Hz	Keysight 53210A
Frequency – Measuring Equipment ³	0.01 Hz to 2 MHz	3.1 parts in 10 ⁶ + 5 µHz	Fluke 5522A

¹ This laboratory offers commercial calibration and field calibration services, where noted.

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 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.

⁵ In the statement of CMC, L is the numerical value of the nominal length of the device measured in inches; R is the numerical value of the resolution of the device, DL is the diagonal length of the device in inches, and t is time in seconds.

⁶ In the statement of CMC, percentages are percent of reading, unless otherwise indicated.

⁷ 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.

⁸ This scope meets A2LA's P112 Flexible Scope Policy.

⁹ 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.



Accredited Laboratory

A2LA has accredited

CROSS TECHNOLOGIES, INC

Lexington, SC

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 29th day of May 2024.

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1741.12
Valid to September 30, 2026

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