SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: June 30, 2028 Certificate Number: 7787.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Chemical

Parameter/Equipment	Range	CMC[2] (±)	Comments
pH – Meters[3]	4 pH 7 pH 10 pH 12.45 pH	0.012 pH 0.012 pH 0.012 pH 0.012 pH	Calibration procedure MET-PTC-14
Conductivity Meters[3]	1 µS/cm 5 µS/cm 10 µS/cm 100 µS/cm 1423 µS/cm 10 000 µS/cm	0.0074 µS/cm 0.042 µS/cm 0.17 µS/cm 0.31 µS/cm 4.4 µS/cm 41 µS/cm	Calibration procedure MET-PTC-13
Turbidity Meters[3]	0.50 NTU 10 NTU 20 NTU 100 NTU 500 NTU 1000 NTU	0.028 NTU 0.075 NTU 0.29 NTU 0.24 NTU 1.5 NTU 2.1 NTU	Calibration procedure MET-PTC-15
Chlorine Analyzer[3]	Up to 3 mg/L	0.084 mg/L	Calibration procedure MET-PTC-37

Parameter/Equipment	Range	CMC[2] (±)	Comments
Refractometers[3]	Up to 40 °Brix (>40 to 66.67) °Brix	0.28 °Brix 0.15 °Brix	Calibration procedure MET-PTC-33

II. Dimensional

Parameter/Equipment	Range	CMC[2] (±)	Comments
Calipers – Outside, Inside, & Depth[3]			
Digital	Up to 300 mm Up to 11.8 in (>300 to 500) mm (>11.8 to 19.7) in (>500 to 600) mm (>19.7 to 23.6) in	6.7 µm 0.000 26 in 6.8 µm 0.000 27 in 6.9 µm 0.000 27 in	Calibration procedure MET-PTC-17
Analog	Up to 600 mm Up to 23.6 in	12 µm 0.000 48 in	
Micrometers – Outside, Inside & Depth Micrometers & Two Contacts[3] –			
Digital	Up to 25 mm Up to 1 in (>25 to 50) mm (>1 to 2) in (>50 to 100) mm (>2 to 4) in (>100 to 300) mm (>4 to 11.8) in (>300 to 400) mm (>12 to 16) in (>400 to 500) mm (>16 to 19.7) in	0.71 µm 0.000 028 in 0.76 µm 0.000 030 in 0.77 µm 0.000 030 in 0.69 µm 0.000 027 in 0.87 µm 0.000 034 in 1.1 µm 0.000 045 in	Calibration procedure MET-PTC-18

Parameter/Equipment	Range	CMC[2] (±)	Comments
Micrometers – Outside, Inside & Depth Micrometers & Two Contacts[3] – (cont)			
Digital	(>500 to 600) mm (>19.7 to 24) in	1.3 µm 0.000 050 in	Calibration procedure MET-PTC-18
Analog	Up to 25 mm Up to 1 in	1.4 µm 0.000 053 in	
	(>25 to 100) mm (>1 to 4) in	1.3 µm 0.000 050 in	
	(>100 to 300) mm (>4 to 11.8) in	1.2 µm 0.000 048 in	
	(>300 to 400) mm (>12 to 16) in	1.3 µm 0.000 050 in	
	(>400 to 500) mm (>16 to 19.7) in	1.5 µm 0.000 060 in	
	(>500 to 600) mm (>19.7 to 24) in	1.6 µm 0.000 063 in	
Mechanical Thickness Gages[3]	Up to 10 mm Up to 0.4 in	0.71 µm 0.000 028 in	Calibration procedure MET-PTC-21
	(>10 to 15) mm (>0.4 to 0.6) in	1.0 µm 0.000 040 in	
	(>15 to 20) mm (>0.6 to 0.8) in	0.71 µm 0.000 028 in	
	(>20 to 25) mm (>0.8 to 1) in	1.0 µm 0.000 040 in	
	(>25 to 50) mm (>1 to 2) in	0.74 µm 0.000 029 in	

Parameter/Equipment	Range	CMC[2, 6] (±)	Comments
Indicators[3]	Up to 10 mm Up to 0.4 in (>10 to 15) mm (>0.4 to 0.6) in (>15 to 20) mm (>0.6 to 0.8) in (>20 to 25) mm (>0.8 to 1) in	0.91 µm 0.000 036 in 1.2 µm 0.000 046 in 0.92 µm 0.000 036 in 1.0 µm 0.000 040 in	Calibration procedure MET-PTC-21
Analog & Digital Weld Gages[3] Radius & Diameter	Up to 10 mm Up to 0.4 in	5.8 µm 0.000 23 in	Calibration procedure MET-PTC-21
Rulers & Tapes & Oil Gauging Tapes	Up to 1 m Up to 39.4 in (>1 to 50) m (>39.4 to 1969) in	0.59 mm 0.023 in $(8.2 \times 10^{-4} \times L + 0.71)$ mm $(8 \times 10^{-7} \times L + 0.028)$ in	Calibration procedure MET-PTC-20
Sieves – Opening Size[3]	Up to 10 mm Up to 0.39 in (>10 to 125) mm (>0.39 to 4.92) in	2.0 µm 0.000 079 in 23 µm 0.000 90 in	Calibration procedure MET-PTC-41
Ultrasonic Thickness Gages[3]	Up to 25 mm Up to 1 in (>25 to 100) mm (>1 to 4) in	9.9 µm 0.000 39 in 5.9 µm 0.000 23 in	Calibration procedure MET-PTC-24
Coating Thickness Gage[3]	Up to 7608 µm Up to 299.5 mil	4.2 µm 0.000 17 in	Calibration procedure MET-PTC-26
Ultrasonic Flaw Detectors[3]	Up to 250 mm Up to 9.8 in	6.6 µm 0.000 26 in	Calibration procedure MET-PTC-27

Parameter/Equipment	Range	CMC[2] (±)	Comments
Reference Blocks for Calibration of Ultrasonic Testing Instruments[3]	Up to 25 mm Up to 1 in (>25 to 300) mm (>1 to 9.8) in	1.1 µm 0.000 044 in 8.3 µm 0.000 33 in	Calibration procedure MET-PTC-45
Feeler/Thickness Gages[3]	Up to 2 mm Up to 0.078 in	1.1 µm 0.000 044 in	Calibration procedure MET-PTC-22
Plastic Shims[3]	Up to 5000 µm Up to 0.2 in (>5000 to 8000) µm (>0.2 to 0.31) in	1.1 µm 0.000 044 in 1.2 µm 0.000 046 in	Calibration procedure MET-PTC-25
Optical & Stereo Microscopes, with Reticle[3]	Up to 400X Magnification	1.2 µm	Calibration procedure MET-PTC-46

III. Dimensional Testing

Parameter/Equipment	Range	CMC[2] (±)	Comments
Dimensional – Length[3]	Up to 1 mm Up to 0.039 in Up to 10 mm Up to 0.39 in Up to 25 mm Up to 1 in Up to 300 mm Up to 8 in Up to 1000 mm Up to 39.4 in Up to 50 000 mm Up to 1968.5 in	0.010 mm 0.000 39 in 0.082 mm 0.0032 in 0.058 mm 0.0022 in 0.059 mm 0.0023 in 0.59 mm 0.023 in 0.64 mm 0.025 in	Vision system with reticule Precision micrometer Micrometer, caliper Ruler Tape master

IV. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Voltage[3] – Generate	Up to 10 mV (>10 to 50) mV (>50 to 100) mV (>100 to 150) mV (>150 to 300) mV (>0.3 to 0.5) V (>0.5 to 0.8) V (>0.8 to 1) V (>1 to 1.5) V (>1.5 to 3) V (>3 to 5) V (>5 to 10) V (>10 to 15) V	0.013 mV 0.018 mV 0.024 mV 0.030 mV 0.048 mV 0.000 066 V 0.000 095 V 0.000 11 V 0.000 16 V 0.000 31 V 0.000 66 V 0.0011 V 0.0016 V	Calibration procedure MET-PTC-40
DC Voltage[3] – Generate	(>15 to 30) V (>30 to 50) V (>50 to 100) V (>100 to 150) V (>150 to 300) V (>300 to 500) V (>500 to 1000) V	0.0031 V 0.0066 V 0.011 V 0.020 V 0.039 V 0.094 V 0.18 V	Calibration procedure MET-PTC-40
DC Current[3] – Generate	Up to 10 µA (>10 to 100) µA (>100 to 150) µA (>150 to 300) µA (>0.3 to 0.5) mA (>0.5 to 1) mA (>1 to 1.5) mA (>1.5 to 3) mA (>3 to 5) mA (>5 to 10) mA (>10 to 15) mA (>15 to 30) mA (>30 to 50) mA (>50 to 100) mA (>100 to 150) mA (>150 to 300) mA (>0.3 to 0.5) A (>0.5 to 1) A (>1 to 1.5) A (>1.5 to 3) A (>3 to 5) A (>5 to 20) A	0.050 µA 0.066 µA 0.075 µA 0.10 µA 0.000 19 mA 0.000 27 mA 0.000 37 mA 0.000 63 mA 0.0045 mA 0.0054 mA 0.0088 mA 0.011 mA 0.034 mA 0.042 mA 0.15 mA 0.17 mA 0.000 21 A 0.000 29 A 0.000 38 A 0.000 64 A 0.0032 A 0.0058 A	Calibration procedure MET-PTC-40

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Current[3] – Generate (cont)			
Clamp-On Meters[3]	Up to 25 A (>25 to 50) A (>50 to 75) A (>75 to 150) A (>150 to 250) A (>250 to 1000) A	0.059 A 0.060 A 0.061 A 0.066 A 0.17 A 0.30 A	Calibration procedure MET-PTC-40
Power DC– Generate [3]			
30 V: (0.03 to 20) A	Up to 0.9 W (>0.9 to 3) W (>3 to 9) W (>9 to 30) W (>30 to 90) W (>90 to 600) W	0.000 37 W 0.0013 W 0.0051 W 0.0093 W 0.022 W 0.19 W	Calibration procedure MET-PTC-40
100 V: (0.03 to 3) A	Up to 3 W (>3 to 10) W (>10 to 30) W (>30 to 100) W (>100 to 300) W	0.0012 W 0.0043 W 0.018 W 0.032 W 0.074 W	
300 V: (0.03 to 3) A	Up to 9 W (>9 to 30) W (>30 to 90) W (>90 to 300) W (>300 to 900) W	0.0035 W 0.013 W 0.054 W 0.098 W 0.23 W	
Resistance – Generate[3]	Up 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 40) MΩ (>40 to 200) MΩ	0.060 Ω 0.14 Ω 0.000 42 kΩ 0.0037 kΩ 0.054 kΩ 0.000 54 MΩ 0.061 MΩ 0.23 MΩ 1.2 MΩ	Calibration procedure MET-PTC-40

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Resistance – Generate[3] (cont)			
Fixed Point	1 MΩ 10 MΩ 100 MΩ 1 GΩ 10 GΩ 100 GΩ 500 GΩ 1 TΩ	0.0058 MΩ 0.058 MΩ 0.58 MΩ 0.0058 GΩ 0.058 GΩ 0.58 GΩ 2.9 GΩ 0.012 TΩ	Calibration procedure MET-PTC-40
Insulation Resistance[3] –			
DC Voltage:			
Up to 100 V	Up 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 40) MΩ (>40 to 200) MΩ	0.060 Ω 0.14 Ω 0.000 71 kΩ 0.0069 kΩ 0.079 kΩ 0.000 79 MΩ 0.062 MΩ 0.24 MΩ 1.2 MΩ	Calibration procedure MET-PTC-39
Up to 10 000 V	Fixed Points 1 MΩ 10 MΩ 100 MΩ 1 GΩ 10 GΩ 100 GΩ 500 GΩ 1 TΩ	0.0082 MΩ 0.082 MΩ 0.58 MΩ 0.0082 GΩ 0.082 GΩ 0.58 GΩ 2.9 GΩ 0.013 TΩ	

Parameter/Range	Frequency	CMC[2, 4] (±)	Comments
AC Voltage – Generate[3]			
Up to 10 mV	60 Hz to 2 kHz	0.041 mV	Calibration procedure MET-PTC-40
(>10 to 100) mV		0.084 mV	
(>100 to 150) mV		0.090 mV	
(>150 to 300) mV		0.14 mV	
(>0.3 to 0.5) V		0.000 42 V	
(>0.5 to 0.8) V		0.000 53 V	
(>0.8 to 1) V		0.000 60 V	
(>1 to 1.5) V		0.0011 V	
(>1.5 to 3) V		0.0018 V	
(>3 to 5) V		0.0042 V	
(>5 to 10) V		0.0060 V	
(>10 to 15) V		0.0078 V	
(>15 to 30) V		0.013 V	
(>30 to 50) V		0.030 V	
(>50 to 100) V		0.048 V	
(>100 to 150) V		0.096 V	
(>150 to 300) V		0.17 V	
(>300 to 500) V		0.42 V	
(>500 to 1000) V		0.60 V	
AC Current – Generate[3]			
Up to 10 µA	60 Hz to 1 kHz	0.14 µA	Calibration procedure MET-PTC-40
(>10 to 300) µA		0.29 µA	
(>0.3 to 0.5) mA		0.000 88 mA	
(>0.5 to 1) mA		0.0011 mA	
(>1 to 1.5) mA		0.0012 mA	
(>1.5 to 3) mA		0.0018 mA	
(>3 to 5) mA		0.0090 mA	
(>5 to 10) mA		0.011 mA	
(>10 to 15) mA		0.013 mA	
(>15 to 30) mA		0.018 mA	
(>30 to 50) mA		0.090 mA	
(>50 to 100) mA		0.11 mA	
(>100 to 150) mA		0.13 mA	
(>150 to 300) mA		0.18 mA	
(>0.3 to 0.5) A		0.000 42 A	
(>0.5 to 1) A		0.000 60 A	
(>1 to 1.5) A		0.0011 A	
(>1.5 to 3) A		0.0017 A	
(>3 to 5) A		0.0066 A	
(>5 to 20) A		0.012 A	

Parameter/Range	Frequency	CMC[2, 4] (±)	Comments
AC Voltage – Generate[3] (cont)			
Clamp On Meters[3]:			
Up to 25 A	60 Hz to 1 kHz	0.061 A	Calibration procedure MET-PTC-40
(>25 to 50) A		0.065 A	
(>50 to 75) A		0.081 A	
(>75 to 150) A		0.10 A	
(>150 to 250) A		0.34 A	
(>250 to 1000) A		0.60 A	

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Power AC– Generate [3]			
30 V:			
(0.03 to 20) A	Up to 0.9 W	0.0011 W	Calibration procedure MET-PTC-40
	(>0.9 to 3) W	0.0036 W	
	(>3 to 9) W	0.011 W	
	(>9 to 30) W	0.036 W	
	(>30 to 90) W	0.11 W	
	(>90 to 600) W	0.72 W	
100 V:			
(0.03 to 20) A	Up to 3 W	0.0036 W	
	(>3 to 10) W	0.012 W	
	(>10 to 30) W	0.036 W	
	(>30 to 100) W	0.12 W	
	(>100 to 300) W	0.36 W	
	(>300 to 2000) W	2.4 W	
300 V:			
(0.03 to 20) A	Up to 9 W	0.011 W	
	(>9 to 30) W	0.036 W	
	(>30 to 90) W	0.11 W	
	(>90 to 300) W	0.36 W	
	(>300 to 900) W	1.1 W	
	(>900 to 6000) W	7.2 W	
Power Factor – Generate[3]	(-1 to 1) p.u	0.000 77 p.u	Calibration procedure MET-PTC-40
Phase Angle – Generate[3]	(-150 to 180) °	0.060 °	Calibration procedure MET-PTC-40

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Voltage[3] – Measure	Up to 1 mV (>1 to 10) mV (>10 to 20) mV (>20 to 50) mV (>50 to 75) mV (>75 to 100) mV (>100 to 190) mV (>0.19 to 0.2) V (>0.2 to 0.5) V (>0.5 to 1) V (>1 to 1.5) V (>1.5 to 1.9) V (>1.9 to 2) V (>2 to 10) V (>10 to 19) V (>19 to 20) V (>20 to 100) V (>100 to 190) V (>190 to 200) V (>200 to 500) V (>500 to 1000) V	0.0055 mV 0.0060 mV 0.0065 mV 0.0079 mV 0.0091 mV 0.010 mV 0.015 mV 0.000 023 V 0.000 036 V 0.000 057 V 0.000 078 V 0.000 095 V 0.000 19 V 0.000 58 V 0.0010 V 0.0024 V 0.0072 V 0.013 V 0.023 V 0.043 V 0.076 V	Calibration procedure MET-PTC-19
DC Current[3] – Measure	Up to 10 µA (>10 to 20) µA (>20 to 50) µA (>50 to 100) µA (>100 to 190) µA (>0.19 to 0.2) mA (>0.2 to 0.5) mA (>0.5 to 1) mA	0.018 µA 0.024 µA 0.042 µA 0.072 µA 0.13 µA 0.000 17 mA 0.000 35 mA 0.000 65 mA	Calibration procedure MET-PTC-19
DC Current[3] – Measure	(>1 to 1.5) mA (>1.5 to 1.9) mA (>1.9 to 2) mA (>2 to 4) mA (>4 to 8) mA (>8 to 10) mA (>10 to 16) mA (>16 to 19) mA (>19 to 20) mA (>20 to 50) mA (>50 to 100) mA (>100 to 190) mA (>0.19 to 0.2) A (>0.2 to 0.5) A (>0.5 to 1) A (>1 to 1.5) A (>1.5 to 1.9) A	0.000 95 mA 0.0012 mA 0.0024 mA 0.0036 mA 0.0060 mA 0.0072 mA 0.011 mA 0.013 mA 0.017 mA 0.035 mA 0.065 mA 0.12 mA 0.000 53 A 0.000 89 A 0.0015 A 0.0021 A 0.0026 A	Calibration procedure MET-PTC-19

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
DC Current[3] – Measure (cont)	(>1.9 to 2) A (>2 to 5) A (>5 to 10) A	0.0042 A 0.0096 A 0.019 A	Calibration procedure MET-PTC-19
Power DC– Measure[3]	Up to 1 W (>1 to 2) W (>2 to 3) W (>3 to 10) W (>10 to 30) W (>30 to 100) W (>100 to 300) W (>0.3 to 1) kW (>1 to 2) kW (>2 to 3) kW (>3 to 4) kW (>4 to 5) kW (>5 to 6) kW (>6 to 12) kW	0.0011 W 0.0016 W 0.0020 W 0.0065 W 0.020 W 0.076 W 0.38 W 0.0025 kW 0.0039 kW 0.0074 kW 0.012 kW 0.013 kW 0.015 kW 0.024 kW	Calibration procedure MET-PTC-19
Resistance – Measure[3]	Up to 1 Ω (>1 to 10) Ω (>10 to 20) Ω (>20 to 50) Ω (>50 to 100) Ω (>100 to 190) Ω	0.036 Ω 0.037 Ω 0.18 Ω 0.23 Ω 0.32 Ω 0.49 Ω	Calibration procedure MET-PTC-19
Resistance – Measure[3]	(>0.19 to 0.2) kΩ (>0.2 to 0.5) kΩ (>0.5 to 1) kΩ (>1 to 1.5) kΩ (>1.5 to 1.9) kΩ (>1.9 to 2) kΩ (>2 to 10) kΩ (>10 to 19) kΩ (>19 to 20) kΩ (>20 to 50) kΩ (>50 to 100) kΩ (>100 to 190) kΩ (>0.19 to 0.2) MΩ (>0.2 to 0.5) MΩ (>0.5 to 1) MΩ (>1 to 1.5) MΩ (>1.5 to 1.9) MΩ (>1.9 to 2) MΩ (>2 to 5) MΩ (>5 to 9.9) MΩ (>9.9 to 10) MΩ	0.000 048 kΩ 0.000 084 kΩ 0.000 14 kΩ 0.000 20 kΩ 0.000 25 kΩ 0.000 48 kΩ 0.0014 kΩ 0.0025 kΩ 0.0048 kΩ 0.0084 kΩ 0.014 kΩ 0.025 kΩ 0.000 041 MΩ 0.000 084 MΩ 0.000 16 MΩ 0.000 23 MΩ 0.000 29 MΩ 0.0022 MΩ 0.0036 MΩ 0.0060 MΩ 0.11 MΩ	Calibration procedure MET-PTC-19

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Resistance – Measure[3] (cont)	(>10 to 50) MΩ (>50 to 100) MΩ	0.49 MΩ 0.97 MΩ	Calibration procedure MET-PTC-19

Parameter/Range	Frequency	CMC[2, 4] (±)	Comments
AC Voltage – Measure[3]			
Up to 10 mV	60 Hz to 1 kHz	0.10 mV	Calibration procedure MET-PTC-19
(>10 to 20) mV		0.11 mV	
(>20 to 50) mV		0.13 mV	
(>50 to 100) mV		0.17 mV	
(>100 to 190) mV		0.23 mV	
(>0.19 to 0.2) V		0.000 87 V	
(>0.2 to 0.5) V		0.0011 V	
(>0.5 to 1) V		0.0014 V	
(>1 to 1.5) V		0.0018 V	
(>1.5 to 1.9) V		0.0021 V	
(>1.9 to 2) V		0.012 V	
(>2 to 10) V		0.019 V	
(>10 to 19) V		0.028 V	
(>19 to 20) V		0.12 V	
(>20 to 100) V		0.19 V	
(>100 to 190) V		0.28 V	
(>190 to 200) V		0.46 V	
(>200 to 500) V		0.75 V	
(>500 to 750) V		0.99 V	
AC Current – Measure[3]			
Up to 10 µA	60 Hz to 1 kHz	0.16 µA	Calibration procedure MET-PTC-19
(>10 to 20) µA		0.18 µA	
(>20 to 50) µA		0.23 µA	
(>50 to 100) µA		0.32 µA	
(>100 to 190) µA		0.49 µA	
(>0.19 to 0.2) mA		0.0013 mA	

Parameter/Range	Frequency	CMC[2, 4] (±)	Comments
AC Current[3] – Measure			
(>0.2 to 0.5) mA	60 Hz to 1 kHz	0.0017 mA	Calibration procedure MET-PTC-19
(>0.5 to 1) mA		0.0024 mA	
(>1 to 1.5) mA		0.0031 mA	
(>1.5 to 1.9) mA		0.0037 mA	
(>1.9 to 2) mA		0.018 mA	
(>2 to 10) mA		0.032 mA	
(>10 to 19) mA		0.049 mA	
(>19 to 20) mA		0.12 mA	
(>20 to 50) mA		0.16 mA	
(>50 to 100) mA		0.22 mA	
(>100 to 190) mA		0.32 mA	
(>0.19 to 0.2) A		0.0018 A	
(>0.2 to 0.5) A		0.0023 A	
(>0.5 to 1) A		0.0032 A	
(>1 to 1.5) A		0.0041 A	
(>1.5 to 1.9) A		0.0049 A	
(>1.9 to 2) A		0.0048 A	
(>2 to 5) A		0.010 A	
(>5 to 10) A		0.019 A	
Power AC – Measure[3]			
Up to 1 W	(52 to 60) Hz	0.0011 W	Calibration procedure MET-PTC-19
(>1 to 2) W		0.0016 W	
(>2 to 3) W		0.0020 W	
(>3 to 10) W		0.0065 W	
(>10 to 30) W		0.020 W	
(>30 to 100) W		0.076 W	
(>100 to 300) W		0.38 W	
(>0.3 to 1) kW		0.0023 kW	
(>1 to 2) kW		0.0035 kW	
(>2 to 3) kW		0.0070 kW	
(>3 to 4) kW		0.012 kW	
(>4 to 5) kW		0.013 kW	
(>5 to 6) kW		0.014 kW	
(>6 to 12) kW		0.021 kW	

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Capacitance – Measure [3]	Up to 0.2 nF (>0.2 to 0.5) nF (>0.5 to 1) nF (>1 to 1.5) nF (>1.5 to 1.9) nF (>1.9 to 2) nF (>2 to 10) nF (>10 to 19) nF (>19 to 20) nF (>20 to 50) nF (>50 to 100) nF (>100 to 190) nF (>0.19 to 0.2) µF (>0.2 to 0.5) µF (>0.5 to 1) µF (>1 to 1.5) µF (>1.5 to 1.9) µF (>1.9 to 2) µF (>2 to 10) µF (>10 to 19) µF (>19 to 20) µF (>20 to 50) µF (>50 to 100) µF (>100 to 190) µF (>0.19 to 0.2) mF (>0.2 to 0.5) mF	0.062 nF 0.070 nF 0.082 nF 0.094 nF 0.1 nF 0.048 nF 0.14 nF 0.25 nF 0.48 nF 0.84 nF 1.4 nF 2.5 nF 0.0048 µF 0.0084 µF 0.014 µF 0.020 µF 0.025 µF 0.048 µF 0.14 µF 0.25 µF 0.48 µF 0.84 µF 1.4 µF 2.5 µF 0.0048 mF 0.0084 mF	Calibration procedure MET-PTC-19
Capacitance – Measure [3]	(>0.5 to 1) mF (>1 to 1.5) mF (>1.5 to 1.9) mF (>1.9 to 2) mF (>2 to 10) mF (>10 to 19) mF (>19 to 20) mF (>20 to 50) mF (>50 to 100) mF (>100 to 190) mF	0.014 mF 0.020 mF 0.025 mF 0.072 mF 0.17 mF 0.28 mF 0.96 mF 2.0 mF 3.8 mF 7.1 mF	Calibration procedure MET-PTC-19

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Simulation of Thermocouples – Measure[3]			
Type B	(0 to 1800) °C	0.91 °C	Calibration procedure MET-PTC-19
Type E	(-150 to 1000) °C	0.61 °C	
Type J	(-150 to 1200) °C	0.61 °C	
Type K	(-100 to 1300) °C	0.61 °C	
Type N	(-100 to 1300) °C	0.61 °C	
Type R	(300 to 1700) °C	0.61 °C	
Type S	(400 to 1700) °C	0.72 °C	
Type T	(-100 to 400) °C	0.61 °C	
Electrical Simulation of RTD – Measure[3]			
RTD – (49 Ω to 2.1 kΩ)	(-200 to 660) °C	0.19 °C	Calibration procedure MET-PTC-19

V. Fluid Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volume – Laboratory Glassware[3]			
Burettes	1 mL 2 mL 5 mL 10 mL 25 mL 50 mL 100 mL	0.58 µL 0.58 µL 0.59 µL 1.2 µL 3.0 µL 6.0 µL 12 µL	Calibration procedure MET-PTC-16

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volume – Laboratory Glassware[3] (cont)			
Single Volume Pipettes	Up to 0.5 mL 1 mL 2 mL 5 mL 10 mL 20 mL 25 mL 50 mL 100 mL	0.067 µL 0.068 µL 0.070 µL 0.58 µL 0.58 µL 0.59 µL 5.8 µL 5.8 µL 5.8 µL	Calibration procedure MET-PTC-16
Graduated Pipettes	0.1 mL 0.2 mL 0.5 mL 1 mL 2 mL 5 mL 10 mL 20 mL 25 mL 50 mL	0.067 µL 0.068 µL 0.070 µL 0.58 µL 0.58 µL 0.59 µL 5.8 µL 5.8 µL 5.8 µL 5.9 µL	
One-Mark Volumetric Flasks	1 mL 2 mL 5 mL 10 mL 20 mL 25 mL 50 mL 100 mL 200 mL 250 mL 500 mL 1000 mL 2000 mL 5000 mL	1.7 µL 1.7 µL 1.7 µL 3.5 µL 6.8 µL 6.9 µL 7.0 µL 7.4 µL 0.013 mL 0.016 mL 0.025 mL 0.040 mL 0.063 mL 0.14 mL	
Pyknometers: Type 1 Type 2 Type 3 Type 4 (Reischauer), Type 5 (Hubbard), Type 6 (With Thermometer Coupled)	 Up to 1 ml 2 ml 5 ml 10 ml 25 ml 50 ml 100 ml	 0.053 µL 0.071 µL 0.15 µL 0.28 µL 0.69 µL 1.4 µL 2.7 µL	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Volume – Laboratory Glassware[3] (cont)			
Graduated Measuring Cylinders	Up to 5 mL 10 mL 25 mL 50 mL 100 mL 250 mL 500 mL 1000 mL 2000 mL	5.8 µL 12 µL 29 µL 58 µL 58 µL 0.12 mL 0.29 mL 0.58 mL 1.2 mL	Calibration procedure MET-PTC-16
Plastic Graduated Measuring Cylinders	Up to 10 mL 25 mL 50 mL 100 mL 250 mL 500 mL 1000 mL 2000 mL 4000 mL	12 µL 29 µL 58 µL 58 µL 0.12 mL 0.29 mL 0.58 mL 1.2 mL 1.2 mL	
Water Trap	Up to 1 mL 2 mL 5 mL 10 mL 25 mL	0.58 µL 1.2 µL 2.9 µL 5.8 µL 12 µL	
Centrifuge Tube	Up to 0.1 mL (>0.1 to 0.3) mL (>0.3 to 0.5) mL (>0.5 to 1) mL (>1 to 2) mL (>2 to 5) mL (>5 to 10) mL (>10 to 25) mL (>25 to 50) mL (>50 to 100) mL	0.58 µL 0.58 µL 0.59 µL 0.64 µL 2.0 µL 2.9 µL 2.9 µL 5.8 µL 29 µL 29 µL	
Imhoff Cone	(0 to 2) mL (>2 to 10) mL (>10 to 40) mL (>40 to 100) mL (>100 to 1000) mL	0.029 mL 0.029 mL 0.058 mL 0.12 mL 2.9 mL	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Piston Operated Volumetric Apparatus[3]			
Piston Pipettes	(>10 to 20) µL 50 µL 100 µL 200 µL 500 µL 1000 µL 2 mL 5 mL 10 mL	0.017 µL 0.033 µL 0.061 µL 0.12 µL 0.29 µL 0.58 µL 1.2 µL 1.2 µL 2.9 µL	Calibration procedure MET-PTC-16
Piston Burettes	1 mL 2 mL 5 mL 10 mL 20 mL 25 mL 50 mL 100 mL	0.58 µL 0.58 µL 0.58 µL 1.2 µL 1.2 µL 1.2 µL 2.9 µL 5.8 µL	
Dispensers	(>0.01 to 0.02) mL 0.05 mL 0.1 mL 0.2 mL 0.5 mL 1 mL 2 mL 5 mL 10 mL 25 mL 50 mL 100 mL 200 mL	0.060 µL 0.060 µL 0.061 µL 0.061 µL 0.58 µL 0.58 µL 0.58 µL 0.59 µL 0.64 µL 0.90 µL 5.8 µL 5.8 µL 5.8 µL	
Volumetric Flow/Infusion Pump[3]	Up to 1 mL/h (>1 to 10) mL/h (>10 to 50) mL/h (>50 to 100) mL/h (>100 to 200) mL/h (>200 to 500) mL/h	0.000 065 mL/h 0.000 22 mL/h 0.0015 mL/h 0.0023 mL/h 0.0035 mL/h 0.010 mL/h	Calibration procedure MET-PTC-44
Water Flow[3] – Flow Meters – Direct Comparison	Up to 30 L/min (>30 to 360) L/min (>360 to 946) L/min	0.095 L/min 1.3 L/min 0.75 L/min	Calibration procedure MET-PTC-34

Parameter/Equipment	Range	CMC[2] (±)	Comments
Specific Gravity (Relative Density) –			
Hydrometers & Equivalent Values in Other Hydrometer Scales: Density (g/mL, g/cm³, °Q, SG, °GL)	Up to 2000 kg/m³	0.066 kg/m³	Calibration procedure MET-PTC-35
API Hydrometers & Thermo-Hydrometers (API Scale for Petroleum Products)	(-1 to 101.0)° API	0.010° API	

VI. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Pressure Transmiters[3]			
Vacuum	(-62 to 0) kPa (-9 to 0) psi	0.059 kPa 0.0086 psi	Calibration procedure MET-PTC-08
Pneumatic	Up to 0.5 kPa Up to 0.073 psi	0.000 59 kPa 0.000 086 psi	
	(0 to 206.843) kPa (0 to 30) psi	0.044 kPa 0.0063 psi	
	(0 to 3448.34) kPa (0 to 500) psi	0.63 kPa 0.091 psi	
Pressure Transmiters[3]			
Hydraulic	(0 to 34 473.79) kPa (0 to 5000) psi	4.6 kPa 0.67 psi	Calibration procedure MET-PTC-08
	(0 to 68 947.57) kPa (0 to 10 000) psi	13 kPa 1.9 psi	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Pressure Gages, Calibrators[3]			
Vacuum	(-62 to 0) kPa (-9 to 0) psi	0.058 kPa 0.0085 psi	Calibration procedure MET-PTC-06
Pneumatic	Up to 0.5 kPa Up to 0.073 psi	0.000 59 kPa 0.000 086 psi	Calibration procedure MET-PTC-07
	(0 to 206.843) kPa (0 to 30) psi	0.028 kPa 0.0041 psi	
Hydraulic	(0 to 3447.38) kPa (0 to 500) psi	0.60 kPa 0.087 psi	
	(0 to 34 473.79) kPa (0 to 5000) psi	4.4 kPa 0.63 psi	
	(0 to 68 947.57) kPa (0 to 10 000) psi	13 kPa 1.9 psi	
Pressure Safety Valve (PSV´s) & Pressure Switch[3]	(-62 to 0) kPa (-9 to 0) psi	0.058 kPa 0.0084 psi	Calibration procedure MET-PTC-42
	(0 to 206.843) kPa (0 to 30) psi	0.028 kPa 0.0041 psi	
	(0 to 3447.38) kPa (0 to 500) psi	0.60 kPa 0.087 psi	
	(0 to 34 473.79) kPa (0 to 5000) psi	4.3 kPa 0.63 psi	
	(0 to 68 947.57) kPa (0 to 10 000) psi	13 kPa 1.9 psi	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Mass –			
OIML Classes F_1, F_2, M_1, M_{1-2}, M_2, M_{2-3}, M_3	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g	0.0060 mg 0.0060 mg 0.0060 mg 0.0062 mg 0.0064 mg 0.0069 mg 0.0075 mg 0.0082 mg 0.0097 mg 0.011 mg 0.013 mg 0.017 mg 0.023 mg 0.032 mg 0.059 mg 0.13 mg 0.23 mg 0.78 mg	Calibration procedure MET-PTC-12
OIML Classes F_2, M_1, M_{1-2}, M_2, M_{2-3}, M_3	1 kg 2 kg 5 kg 10 kg 20 kg	2.0 mg 3.7 mg 11 mg 0.059 g 0.063 g	
OIML Classes M_{1-2}, M_2, M_{2-3}, M_3	50 kg	0.21 g	
No Normalizes	(1 to 15) mg (>15 to 150) mg (>0.15 to 1.5) g (>1.5 to 15) g (>15 to 150) g (>150 to 250) g (>250 to 350) g (>350 to 450) g (>450 to 550) g (>550 to 650) g (>650 to 850) g (>850 to 1500) g (>1.5 to 3) kg (>3 to 7.5) kg (>7.5 to 15) kg (>15 to 25) kg (>25 to 50) kg	0.0065 mg 0.0084 mg 0.012 mg 0.026 mg 0.17 mg 0.63 mg 0.68 mg 0.74 mg 0.81 mg 1.2 mg 1.3 mg 0.0024 g 0.057 g 0.098 g 0.19 g 0.31 g 0.45 g	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Scales, Comparators & Balances[3]	Up to 100 mg (>0.1 to 1) g (>1 to 5) g (>5 to 30) g (>30 to 81) g (>81 to 110) g (>110 to 220) g (>220 to 350) g (>350 to 500) g (>500 to 700) g (>700 to 1200) g (>1200 to 2000) g (>2000 to 3000) g (>3000 to 4000) g (>4000 to 6200) g (>6.2 to 15) kg (>15 to 20) kg (>20 to 30) kg (>30 to 50) kg (>30 to 100) kg (>100 to 200) kg (>200 to 300) kg (>300 to 400) kg (>400 to 500) kg (>500 to 600) kg (>600 to 1000) kg	0.0051 mg 0.0099 mg 0.016 mg 0.15 mg 0.18 mg 0.19 mg 0.26 mg 0.37 mg 0.81 mg 1.3 mg 1.2 mg 3.1 mg 8.9 mg 10 mg 81 mg 0.25 g 0.21 g 0.88 g 0.98 g 1.3 g 2.6 g 4.0 g 5.5 g 6.9 g 12 g 16 g	Calibration procedure MET-PTC-11
Torque Tools & Torque Wrenches	Up to 20 N·m (>20 to 50) N·m (>50 to 100) N·m (>100 to 200) N·m (>200 to 500) N·m (>500 to 820) N·m (>500 to 1000) N·m (>1000 to 3000) N·m	0.000 67 N·m 0.0012 N·m 0.0060 N·m 0.0071 N·m 0.058 N·m 0.060 N·m 0.060 N·m 0.58 N·m	Calibration procedure MET-PTC-38

VII. Optical Quantities

Parameter/Equipment	Range	CMC[2] (±)	Comments
Spectrophotometers[3]			
Absorbance:			
λ: (257 to 350) nm	(0.47 to 0.66) A	0.0068 A	Calibration procedure MET-PTC-36
λ: (>350 to 750) nm	(0.13 to 3.0) A	0.0029 A	
Transmittance:			
λ: (257 to 750) nm	Up to 0.060 %	0.053 % of transmittance	
	(>0.060 to 0.208) %	0.093 % of transmittance	
	(>0.208 to 0.31) %	0.088 % of transmittance	
	(>0.31 to 2.305) %	0.064 % of transmittance	
	(>2.305 to 22.365) %	0.058 % of transmittance	
	(>22.365 to 22.695) %	0.069 % of transmittance	
	(>22.695 to 23.647) %	0.060 % of transmittance	
	(>23.647 to 27.949) %	0.058 % of transmittance	
	(>27.949 to 50.904) %	0.056 % of transmittance	
	(>50.904 to 67.35) %	0.053 % of transmittance	
	(>67.35 to 74.433) %	0.057 % of transmittance	
Wavelength:			
SBW: (1 to 10) nm	(430.17 to 875.56) nm	0.11 nm	

VIII. Thermodynamics

Parameter/Equipment	Range	CMC[2] (±)	Comments
Thermo-Hygrometers, Dataloggers & Heat Stress WBGT Meters			
Temperature	0 °C	0.13 °C	Calibration procedure MET-PTC-05
	(>0 to 10) °C	0.12 °C	
	(>10 to 40) °C	0.28 °C	
	(>40 to 65) °C	0.30 °C	
Humidity	10 % RH	1.3 % RH	
	(>10 to 50) % RH	1.0 % RH	
	(>50 to 90) % RH	1.1 % RH	

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Digital Thermometers[3] with RTD sensors (Thermistors, Thermocouples, Thermometers Bimetallic With Pattern Sensor).	(-40 to -20) °C (>-20 to 0) °C (>0 to 30) °C (>30 to 80) °C (>80 to 150) °C (>150 to 200) °C (>200 to 420) °C	0.047 °C 0.052 °C 0.049 °C 0.080 °C 0.085 °C 0.090 °C 0.093 °C	Calibration procedure MET-PTC-01
Bi-Metal Thermometers[3]	(-40 to 30) °C (>30 to 420) °C	0.15 °C 0.17 °C	Calibration procedure MET-PTC-02
Liquid-In-Glass Thermometers[3]	-40 °C (>-40 to -20) °C (>-20 to 0) °C (>0 to 30) °C (>30 to 80) °C (>80 to 150) °C (>150 to 200) °C (>200 to 420) °C	0.049 °C 0.050 °C 0.055 °C 0.052 °C 0.081 °C 0.086 °C 0.092 °C 0.094 °C	Calibration procedure MET-PTC-32
Temperature Transmiters[3]	(-40 to -20) °C (>-20 to 0) °C (>0 to 30) °C (>30 to 80) °C (>80 to 150) °C (>150 to 200) °C (>200 to 300) °C (>300 to 420) °C	0.043 °C 0.041 °C 0.044 °C 0.059 °C 0.067 °C 0.074 °C 0.086 °C 0.082 °C	Calibration procedure MET-PTC-43
Infrared Temperature – Measuring Equipment	-20 °C (>-20 to 0) °C (>0 to 30) °C (>30 to 80) °C (>80 to 125) °C (>125 to 150) °C (>150 to 175) °C (>175 to 200) °C (>200 to 300) °C (>300 to 420) °C	0.63 °C 0.30 °C 0.19 °C 0.62 °C 0.98 °C 1.2 °C 1.4 °C 1.6 °C 2.4 °C 3.4 °C	Calibration procedure MET-PTC-31 Emissivity: Ɛ = 0.95

Parameter/Equipment	Range	CMC[2] (±)	Comments
Climatic Chambers (Including Isothermal Environments, Autoclaves, Cold Rooms, Centrifuges, Dry Wells, Environmental Chambers, Freezers, Furnaces, Incubators, Liquid Baths, Muffle Furnaces, Ovens, Refrigerators, Stability Rooms, Sterile Rooms, Thermoreactors, Trucks, Warehouses, Weather Chambers)[3]			
Humidity	(10 to 50) % RH (>50 to 90) % RH	0.91 % RH 1.0 % RH	Calibration procedure MET-PTE-01
Temperature	-40 °C (>-40 to 0) °C (>0 to 50) °C (>50 to 150) °C (>150 to 200) °C (>200 to 420) °C (>420 to 900) °C (>900 to 1084) °C	0.021 °C 0.022 °C 0.025 °C 0.038 °C 0.043 °C 0.048 °C 0.54 °C 0.83 °C	

IX. Time and Frequency

Parameter/Equipment	Range	CMC[2] (±)	Comments
Timers & Chronometers[3]	(0 to 180) s (>180 to 600) s (>600 to 1800) s (>1800 to 3600) s (>3600 to 7200) s (>7200 to 14 400) s (>14 400 to 18 000) s	0.027 s 0.028 s 0.037 s 0.063 s 0.12 s 0.24 s 0.28 s	Calibration procedure MET-PTC-09
Hour-Meter[3]	Up to 18 000 s (>18 000 to 86 400) s	0.53 s 0.55 s	Calibration procedure MTC-PTC-10

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Centrifuges & Rotational Devices[3]	Up to 900 rpm (>900 to 3000) rpm (>3000 to 12 000) rpm (>12 000 to 20 000) rpm (>20 000 to 30 000) rpm (>30 000 to 60 000) rpm	0.15 rpm 0.83 rpm 1.1 rpm 1.2 rpm 1.5 rpm 2.3 rpm	Calibration procedure MTC-PTC-30
Frequency– Measuring Equipment[3]	Up to 10 Hz (>10 to 40) Hz (>40 to 50) Hz (>50 to 100) Hz (>100 to 400) Hz (>400 to 1000) Hz (>1 to 10) kHz (>10 to 100) kHz (>100 to 500) kHz	0.0012 Hz 0.0047 Hz 0.0059 Hz 0.012 Hz 0.023 Hz 0.059 Hz 0.000 59 kHz 0.0059 kHz 0.029 kHz	Calibration procedure MET-PTC-40
Frequency– Measure[3]	Up to 3 Hz (>3 to 4) Hz (>4 to 5) Hz (>5 to 6) Hz (>6 to 7) Hz (>7 to 8) Hz (>8 to 9) Hz (>9 to 10) Hz (>10 to 20) Hz (>20 to 30) Hz (>30 to 40) Hz (>40 to 50) Hz (>50 to 100) Hz (>100 to 500) Hz (>0.5 to 1) kHz (>1 to 10) kHz (>10 to 100) kHz (>100 to 300) kHz (>300 to 400) kHz (>400 to 500) kHz (>500 to 600) kHz (>600 to 800) kHz (>0.8 to 1) MHz	0.0025 Hz 0.0033 Hz 0.0042 Hz 0.0028 Hz 0.0033 Hz 0.0038 Hz 0.0043 Hz 0.0047 Hz 0.0050 Hz 0.0076 Hz 0.0057 Hz 0.0042 Hz 0.0083 Hz 0.042 Hz 0.000 083 kHz 0.000 83 kHz 0.0083 kHz 0.025 kHz 0.033 kHz 0.042 kHz 0.050 kHz 0.067 kHz 0.000 083 MHz	Calibration procedure MET-PTC-19

[1] This laboratory offers commercial calibration service.

[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] 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.

[6] In the statement of CMC, L is the length of the measure device under test.

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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 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 7th day of July 2026.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7787.01
Valid to June 30, 2028

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