



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: April 30, 2023

Certificate Number: 2039.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 8}:

I. Dimensional

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|----------------------------------|-------------|----------------------|-------------|
| Calipers ³ | Up to 12 in | 740 µin | Gage blocks |
| Outside Micrometers ³ | Up to 3 in | 72 µin | Gage blocks |

II. Electrical – DC/Low Frequency

| Parameter/Equipment | Range | CMC ^{2, 5} (±) | Comments |
|-----------------------|---|---|-------------|
| DC Voltage – Generate | (0 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V | 0.0020 % + 1 µV 0.0011 % + 2 µV 0.0012 % + 20 µV 0.0018 % + 0.15 mV 0.0018 % + 1.5 mV | Fluke 5522A |
| DC Voltage – Measure | (0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V (200 to 1000) V | 0.26 µV 1.5 µV 14 µV 0.19 mV 1.3 mV | Fluke 8508A |

| Parameter/Equipment | Range | CMC ^{2, 5} (\pm) | Comments |
|-----------------------|--|---|-----------------------------|
| DC Current – Generate | (0 to 330) μ A (0.33 to 3.3) mA (3.3 to 33) mA (33 to 330) mA (0.33 to 1.1) A (1.1 to 3) A (3 to 11) A (11 to 20) A | 0.015 % + 0.02 μ A 0.010 % + 0.05 μ A 0.010 % + 0.25 μ A 0.010 % + 2.5 μ A 0.020 % + 40 μ A 0.038 % + 40 μ A 0.050 % + 0.5 mA 0.10 % + 0.75 mA | Fluke 5522A |
| Clamp-on Meters | (20 to 150) A (150 to 550) A (550 to 1000) A | 0.038 % + 0.005 mA 0.050 % + 25 mA 0.10 % + 38 mA | Fluke 5522A w/ 50 turn coil |
| DC Current – Measure | (0 to 200) μ A (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A | 0.73 nA 7.3 nA 76 nA 6.0 μ A 61 μ A 1.4 mA | Fluke 8508A |
| Resistance – Generate | (0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (330 to 1100) Ω (1.1 to 3.3) k Ω (3.3 to 11) k Ω (11 to 33) k Ω (33 to 110) k Ω (110 to 330) k Ω (0.33 to 1.1) M Ω (1.1 to 3.3) M Ω (3.3 to 11) M Ω (11 to 33) M Ω (33 to 110) M Ω (110 to 330) M Ω (0.33 to 1.1) G Ω | 0.0040 % + 0.01 Ω 0.0030 % + 0.015 Ω 0.0028 % + 0.015 Ω 0.0028 % + 0.020 Ω 0.0028 % + 0.020 Ω 0.0028 % + 0.20 Ω 0.0028 % + 0.10 Ω 0.0028 % + 1.0 Ω 0.0028 % + 1.0 Ω 0.0032 % + 10 Ω 0.0032 % + 10 Ω 0.0061 % + 0.15 k Ω 0.013 % + 0.25 k Ω 0.026 % + 2.4 k Ω 0.051 % + 3.0 k Ω 0.30 % + 0.1 M Ω 1.50 % + 0.5 M Ω | Fluke 5522A |

| Parameter/Equipment | Range | CMC ^{2, 4, 5} (\pm) | Comments |
|-------------------------------|--|---|-------------|
| Resistance – Measure | Up to 2 Ω (2 to 20) Ω (20 to 200) Ω (0.2 to 2) k Ω (2 to 20) k Ω (20 to 200) k Ω (0.2 to 2) M Ω (2 to 20) M Ω (20 to 200) M Ω (0.2 to 2) G Ω | 0.0018 % + 3.9 $\mu\Omega$ 0.000 95 % + 14 $\mu\Omega$ 0.000 83 % + 48 $\mu\Omega$ 0.000 82 % + 49 $\mu\Omega$ 0.000 81 % + 4.9 m Ω 0.000 84 % + 48 m Ω 0.0010 % + 94 m Ω 0.0023 % + 96 Ω 0.013 % + 9.9 k Ω 0.15 % + 1.0 M Ω | Fluke 8508A |
| RTD Indicators ³ – | | | |
| Pt 385, 100 Ω | (-200 to -80) $^{\circ}\text{C}$ (-80 to 0) $^{\circ}\text{C}$ (0 to 100) $^{\circ}\text{C}$ (100 to 300) $^{\circ}\text{C}$ (300 to 400) $^{\circ}\text{C}$ (400 to 630) $^{\circ}\text{C}$ (630 to 800) $^{\circ}\text{C}$ | 0.050 $^{\circ}\text{C}$ 0.050 $^{\circ}\text{C}$ 0.070 $^{\circ}\text{C}$ 0.090 $^{\circ}\text{C}$ 0.10 $^{\circ}\text{C}$ 0.12 $^{\circ}\text{C}$ 0.23 $^{\circ}\text{C}$ | Fluke 5522A |
| Pt 385, 200 Ω | (-200 to 100) $^{\circ}\text{C}$ (100 to 260) $^{\circ}\text{C}$ (260 to 300) $^{\circ}\text{C}$ (300 to 400) $^{\circ}\text{C}$ (400 to 600) $^{\circ}\text{C}$ (600 to 630) $^{\circ}\text{C}$ | 0.040 $^{\circ}\text{C}$ 0.050 $^{\circ}\text{C}$ 0.12 $^{\circ}\text{C}$ 0.13 $^{\circ}\text{C}$ 0.14 $^{\circ}\text{C}$ 0.16 $^{\circ}\text{C}$ | |
| Pt 385, 500 Ω | (-200 to -80) $^{\circ}\text{C}$ (-80 to 100) $^{\circ}\text{C}$ (100 to 260) $^{\circ}\text{C}$ (260 to 400) $^{\circ}\text{C}$ (400 to 600) $^{\circ}\text{C}$ (600 to 630) $^{\circ}\text{C}$ | 0.040 $^{\circ}\text{C}$ 0.050 $^{\circ}\text{C}$ 0.060 $^{\circ}\text{C}$ 0.080 $^{\circ}\text{C}$ 0.090 $^{\circ}\text{C}$ 0.11 $^{\circ}\text{C}$ | |
| Pt 385, 1000 Ω | (-200 to 0) $^{\circ}\text{C}$ (0 to 100) $^{\circ}\text{C}$ (100 to 260) $^{\circ}\text{C}$ (260 to 400) $^{\circ}\text{C}$ (400 to 600) $^{\circ}\text{C}$ (600 to 630) $^{\circ}\text{C}$ | 0.030 $^{\circ}\text{C}$ 0.040 $^{\circ}\text{C}$ 0.050 $^{\circ}\text{C}$ 0.060 $^{\circ}\text{C}$ 0.070 $^{\circ}\text{C}$ 0.23 $^{\circ}\text{C}$ | |

| Parameter/Equipment | Range | CMC ^{2, 4} (±) | Comments |
|--|--|---|-------------|
| RTD Indicators ³ – (cont) | | | |
| Pt 3926, 100 Ω | (-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C | 0.050 °C 0.050 °C 0.070 °C 0.090 °C 0.10 °C 0.12 °C | Fluke 5522A |
| Pt 3916, 100 Ω | (-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C | 0.25 °C 0.040 °C 0.050 °C 0.060 °C 0.070 °C 0.080 °C 0.090 °C 0.10 °C 0.23 °C | |
| Cu 427, 10 Ω | (-100 to 260) °C | 0.030 °C | |
| Thermocouple Indicators ³ – | | | |
| Type B | (600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C | 0.44 °C 0.34 °C 0.30 °C 0.33 °C | Fluke 5522A |
| Type C | (0 to 150) °C (150 to 650) °C (650 to 1000) °C (1000 to 1800) °C (1800 to 2316) °C | 0.30 °C 0.26 °C 0.31 °C 0.50 °C 0.84 °C | |
| Type E | (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C | 0.50 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C | |
| Type J | (-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C | 0.27 °C 0.16 °C 0.14 °C 0.17 °C 0.23 °C | |

| Parameter/Equipment | Range | CMC ^{2, 4} (±) | Comments |
|--|---|---|-------------|
| Thermocouple Indicators ³ – (cont) | | | |
| Type K | (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C | 0.33 °C 0.18 °C 0.16 °C 0.26 °C 0.40 °C | Fluke 5522A |
| Type N | (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C | 0.40 °C 0.22 °C 0.19 °C 0.18 °C 0.27 °C | |
| Type R | (0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C | 0.57 °C 0.35 °C 0.33 °C 0.40 °C | |
| Type S | (0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C | 0.47 °C 0.36 °C 0.37 °C 0.46 °C | |
| Type T | (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C | 0.63 °C 0.24 °C 0.16 °C 0.14 °C | |
| Type U | (-200 to 0) °C (0 to 600) °C | 0.56 °C 0.27 °C | |

| Parameter/Range | Frequency | CMC ^{2, 5} (±) | Comments |
|-----------------------|---|---|-------------|
| AC Voltage – Generate | | | |
| (1 to 33) mV | (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 | 0.074 % + 8.5 μV 0.014 % + 6.7 μV 0.019 % + 6.7 μV 0.095 % + 8.0 μV 0.35 % + 13 μV 0.79 % + 53 μV | Fluke 5522A |
| (33 to 330) mV | (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 | 0.030 % + 8.1 μV 0.014 % + 8.0 μV 0.016 % + 8.0 μV 0.035 % + 8.0 μV 0.080 % + 32 μV 0.20 % + 70 μV | |
| 330 mV to 3.3 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 | 0.022 % + 420 μV 0.014 % + 96 μV 0.018 % + 92 μV 0.029 % + 90 μV 0.069 % + 180 μV 0.23 % + 910 μV | |
| (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 | 0.029 % + 910 μV 0.015 % + 600 μV 0.009 % + 12 mV 0.018 % + 11 mV 0.053 % + 21 mV | |
| (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 | 0.019 % + 2.1 mV 0.020 % + 6.1 mV 0.025 % + 6.0 mV 0.030 % + 7.0 mV 0.020 % + 52 mV | |
| (330 to 1020) V | 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz | 0.030 % + 13 mV 0.024 % + 22 mV 0.030 % + 13 mv | |

| Parameter/Range | Frequency | CMC ^{2, 4, 5} (±) | Comments |
|----------------------|--|---|-------------|
| AC Voltage – Measure | | | |
| Up to 200 mV | (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz | 0.018 % + 14 µV 0.015 % + 3.9 µV 0.012 % + 3.9 µV 0.012 % + 1.9 µV 0.014 % + 3.9 µV 0.036 % + 7.8 µV 0.077 % + 20 µV | Fluke 8508A |
| 200 mV to 2 V | (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz | 0.015 % + 130 µV 0.011 % + 50 µV 0.0087 % + 52 µV 0.0065 % + 55 µV 0.010 % + 52 µV 0.023 % + 58 µV 0.058 % + 200 µV 0.30 % + 2.0 mV 1.0 % + 20 mV | |
| (2 to 20) V | (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz | 0.015 % + 1.2 mV 0.01 % + 190 µV 0.0094 % + 200 µV 0.0084 % + 190 µV 0.011 % + 200 µV 0.022 % + 400 µV 0.057 % + 2.0 mV 0.30 % + 20 mV 1.0 % + 200 mV | |
| (20 to 200) V | (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz | 0.015 % + 12 mV 0.013 % + 1.9 mV 0.0098 % + 1.9 mV 0.0082 % + 1.9 mV 0.012 % + 1.9 mV 0.022 % + 4.0 mV 0.057 % + 20 mV 0.30 % + 200 mV 1.0 % + 2.0 V | |
| (200 to 1000) V | 1 Hz to 10 kHz (10 to 30) kHz | 0.015 % + 60 mV 0.064 % + 20 mV | |

| Parameter/Range | Frequency | CMC ^{2, 4, 5} (±) | Comments |
|-----------------------|---|---|-------------|
| AC Current – Generate | | | |
| (29 to 330) µA | (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 | 0.20 % + 0.10 µA 0.15 % + 0.10 µA 0.13 % + 0.1 µA 0.30 % + 0.15 µA 0.80 % + 0.20 µA 1.6 % + 0.40 µA | Fluke 5522A |
| 330 µA 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 | 0.20 % + 0.15 µA 0.13 % + 0.15 µA 0.10 % + 0.15 µA 0.20 % + 0.20 µA 0.50 % + 0.30 µA 1.0 % + 0.60 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 | 0.18 % + 2.0 µA 0.090 % + 2.0 µA 0.040 % + 2.0 µA 0.080 % + 2.0 µA 0.20 % + 3.0 µA 0.40 % + 4.0 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 | 0.18 % + 20 µA 0.090 % + 20 µA 0.040 % + 20 µA 0.080 % + 50 µA 0.20 % + 100 µA 0.40 % + 200 µA | |
| 330 mA to 3 A | (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz | 0.18 % + 100 µA 0.050 % + 100 µA 0.60 % + 1.0 mA 2.5 % + 5.0 mA | |
| (3 to 11) A | (45 to 100) Hz 45 Hz to 1 kHz (1 to 5) kHz | 0.06 % + 2.0 mA 0.10 % + 2.0 mA 3.0 % + 2.0 mA | |
| (11 to 20.5) A | (45 to 100) Hz 45 Hz to 1 kHz (1 to 5) kHz | 0.12 % + 5 mA 0.15 % + 5 mA 3.0 % + 5 mA | |

| Parameter/Range | Frequency | CMC ^{2, 4, 5} (±) | Comments |
|-----------------------|--|---|-----------------------------|
| AC Current – Generate | | | |
| Clamp-on Meters | | | |
| (1.65 to 16.5) A | (10 to 100) Hz 100 Hz to 1 kHz | 0.08 % + 2.0 mA 0.20 % + 5.0 mA | Fluke 5522A w/ 50-turn coil |
| (16.5 to 150) A | (10 to 100) Hz 100 Hz to 1 kHz | 0.12 % + 10 mA 0.30 % + 50 mA | |
| (150 to 1025) A | (10 to 100) Hz 100 Hz to 1 kHz | 0.12 % + 0.10 A 1.0 % + 0.25 A | |
| AC Current – Measure | | | |
| Up to 200 µA | (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz | 0.040 % + 22 nA 0.040 % + 22 nA 0.061 % + 22 nA 0.39 % + 22 nA | Fluke 8508A |
| 200 µA to 2 mA | (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz | 0.022 % + 220 nA 0.021 % + 220 nA 0.061 % + 220 nA 0.39 % + 220 nA | |
| (2 to 20) mA | (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz | 0.022 % + 2.2 µA 0.021 % + 2.2 µA 0.061 % + 2.2 µA 0.39 % + 2.2 µA | |
| (20 to 200) mA | (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz | 0.022 % + 22 µA 0.021 % + 22 µA 0.053 % + 22 µA | |
| 200 mA to 2 A | (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz | 0.053 % + 220 µA 0.066 % + 220 µA 0.29 % + 220 µA | |
| (2 to 20) A | 10 Hz to 2 kHz (2 to 10) kHz | 0.073 % + 2.2 mA 0.25 % + 2.2 mA | |

| Parameter/Equipment | Frequency | CMC ^{2, 4, 5} (±) | Comments |
|---------------------------|--|--|-------------|
| Capacitance – Generate | (0.19 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 3.2999) mF (3.3 to 10.9999) mF (11 to 32.9999) mF (33 to 110) mF | 0.50 % + 0.01 nF 0.25 % + 0.01 nF 0.25 % + 0.10 nF 0.25 % + 0.30 nF 0.25 % + 1.0 nF 0.25 % + 3.0 nF 0.25 % + 10 nF 0.40 % + 30 nF 0.45 % + 0.10 µF 0.45 % + 0.30 µF 0.45 % + 1.0 µF 0.45 % + 3.0 µF 0.45 % + 10 µF 0.75 % + 30 µF 1.1 % + 0.1 mF | Fluke 5522A |

III. Fluid Quantities

| Parameter/Equipment | Range | CMC ^{2, 4, 7} (±) | Comments |
|---|---|---|-------------------------|
| Air Flow ³ – Measure Air Velocity | (40 to 120) fpm (120 to 200) fpm | 6.4 fpm 8.5 fpm | TSI 9565P anemometer |
| Burettes ³ | (1 to 20) mL (20 to 200) mL 200 mL to 1 L | 0.73 µL 0.15 % of rdg + 0.70 µL 0.063 % of rdg + 3.3 µL | Gravimetric method |
| Pipettes ³ | 0.1 µL ≤ 0.2 µL ≤ 0.5 µL ≤ 1.0 µL ≤ 2.0 µL ≤ 5.0 µL ≤ 10 µL ≤ 20 µL ≤ 50 µL ≤ 100 µL ≤ 200 µL ≤ 500 µL ≤ 1000 µL ≤ 2000 µL ≤ 5000 µL ≤ 10 000 µL | 0.033 µL 0.039 µL 0.047 µL 0.045 µL 0.053 µL 0.081 µL 0.058 µL 0.14 µL 0.13 µL 0.36 µL 0.81 µL 0.6 µL 0.9 µL 3 µL 8 µL 20 µL | Gravimetric method |

IV. Mechanical

| Parameter/Equipment | Range | CMC ^{2, 6, 7} (±) | Comments |
|--|---|---|--|
| Weighing Scales, Fixed Points | 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 25 kg 50 kg 100 kg 200 kg | 700 µg 1.0 mg 1.9 mg 3.5 mg 6.6 mg 16 mg 34 mg 82 mg 160 mg 330 mg 67 mg | ASTM Class 1 weights |
| Pressure – Measuring Equipment | | | |
| Barometric | (600 to 1100) hPa | 0.098 hPa | Vaisala PTB 330 |
| Low | (-0.5 to 0.5) inH2O (-30 to 30) inH2O (-30 to 0) inHg | 0.0012 in H2O 0.035 in H2O 0.013 % of rdg + 0.0009 inHg | ADT760 w/ DP5 ADT760 w/ DP30 Fluke P3045 |
| Medium | (5 to 500) psig | 0.013 % of rdg + 0.012 psi | Fluke P3025 |
| High | (200 to 10 000) psig | 0.015 % of rdg + 0.6R | Fluke P3124 |
| Precision Scales and Balances ³ | (1 to 500) mg | 12 µg | ASTM Class 1 weights |
| Fixed Points | 1 g 2 g 5 g 10 g 20 g 50 g 100 g 150 g 200 g 300 g 400 g 500 g | 41 µg 43 µg 44 µg 60 µg 89 µg 180 µg 340 µg 470 µg 620 µg 6.3 mg 6.2 mg 6.4 mg | |

| Parameter/Equipment | Range | CMC ^{2,7} (±) | Comments |
|---|---|---|------------------------|
| Precision Scales and Balances ³ (cont) | | | |
| Fixed Points | 600 g 800 g 1 kg 2 kg 5 kg 10 kg | 6.6 mg 7.0 mg 7.4 mg 8.3 mg 16 mg 78 mg | ASTM Class 1 weights |
| Mass | 1 mg 2 mg 3 mg 5 mg 10 mg 20 mg 30 mg 50 mg 100 mg 200 mg 300 mg 500 mg 1 g 2 g 3 g 5 g 10 g 20 g 30 g 50 g 100 g 200 g 300 g 500 g 1 kg 2 kg 3 kg 5 kg 10 kg | 1.5 µg 1.7 µg 2.9 µg 1.7 µg 1.2 µg 2.3 µg 1.8 µg 1.2 µg 1.3 µg 1.3 µg 1.4 µg 2.4 µg 3.5 µg 3.4 µg 5.1 µg 5.0 µg 7.7 µg 11 µg 7.6 µg 21 µg 43 µg 35 µg 0.17 mg 0.16 mg 0.21 mg 0.30 mg 0.80 mg 2.2 mg 4.3 mg | ASTM Class 000 weights |

| Parameter/Equipment | Range | CMC ^{2, 6, 7} (±) | Comments |
|--|--|--|--|
| Extrusion Plastometers ³ – Dimensional Measurements | | | |
| Cylinder Bore Diameter | Up to 10 mm | 5.8 µm | Laboratory procedure Doc. No.5-4WI05 |
| Die Diameter | Up to 3 mm | 0.64 µm | |
| Piston Rod and Land Diameter, Land Length | Up to 10 mm | 3.7 µm | |
| Temperature | (116 to 300) °C (240 to 572) °F | 0.047 °C (47 mK) 0.085 °F | |
| | (301 to 650) °C (573 to 1202) °F | 0.076 °C (76 mK) 0.14 °F | |
| Load | 100 g to 31.6 kg | 0.1 % of nominal value | |
| Rotational Speed – Measure | (30 to 100 000) RPM | 120 parts in 10 ⁶ + 0.6R | Omega HHT12, Monarch PT200 |
| Rotational Speed – Generate | (30 to 99) RPM (100 to 300 000) RPM | 2 parts in 10 ⁶ + 1.0R 2 parts in 10 ⁶ + 0.6R | Fluke 5522A w/ strobe |

V. Optical Quantities

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|---|----------------------------|--------------------------|----------|
| Optical Transmission Density – Densitometer | (0 to 3) g/cm ³ | 0.0001 g/cm ³ | CRM |

VI. Thermodynamics

| Parameter/Equipment | Range | CMC ^{2, 5, 7} (±) | Comments |
|--|---------------------------------------|------------------------------|-------------------|
| Temperature ³ – Measuring Equipment | (-200 to 115) °C (-328 to 239) °F | 0.032 °C (32 mK) 0.058 °F | PRT and indicator |
| | (116 to 300) °C (240 to 572) °F | 0.047 °C (47 mK) 0.085 °F | |
| | (301 to 650) °C (573 to 1202) °F | 0.076 °C (76 mK) 0.14 °F | |
| | (650 to 1000) °C (1201 to 1832) °F | 0.085 °C (85 mK) 0.15 °F | |
| Humidity ³ – Measure | (20 to 70) % RH | 2.1 % RH | Fluke 2626-S |

VII. Time & Frequency

| Parameter/Equipment | Frequency | CMC ^{2, 4, 7} (±) | Comments |
|----------------------|--------------------|--------------------------------------|----------------------|
| Frequency – Generate | 0.01 Hz to 2.0 MHz | 2.5 parts in 10 ⁶ + 5 μHz | Fluke 5522A |
| Frequency – Measure | DC to 225 MHz | 0.10 Hz | Agilent 53132A |
| Time – Measure | Up to 86 400 s | 6.1 parts in 10 ⁶ per s | Witschi Qtest 6000 |
| | Up to 36 000 s | 10 parts in 10 ⁶ + 120 ms | Control Company 1048 |

¹ This laboratory offers commercial calibration service and field 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 contributions from the "best existing device" are not included in the CMC claim.
- ⁵ 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.
- ⁶ In the statement of CMC, *R* stands for the resolution of the unit under test.
- 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*.



Accredited Laboratory

A2LA has accredited

ALLOMETRICS, INC.

Webster, TX

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 12th day of April 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2039.01
Valid to April 30, 2023

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