



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

APPLIED TEST SYSTEMS
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Butler, PA 16002
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CALIBRATION

Valid To: February 29, 2020

Certificate Number: 2132.01

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

I. Dimensional

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|--|---|------------------------------|-------------------------------------|
| Displacement ³ – Extensometers | (0.0002 to 0.140) in (0.141 to 0.500) in | 0.000 071 in 0.000 092 in | ASTM E83 w/ micrometer heads |
| | (0.05 to 0.400) in Up to 10 mm | 0.000 19 in (0.0047 mm) | Calipers and outside micrometers |
| | (0.4 to 6) in (10 to 152) mm | 0.0023 in (0.059 mm) | |

II. Electrical – DC/Low Frequency

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|---|-------------------|----------------------|----------------------|
| Electronic Calibration of Thermocouple Indicators – | | | |
| Type B | (600 to 1650) °C | 0.58 °C | Fluke 724 simulation |
| Type J | (-150 to 1000) °C | 0.58 °C | |
| Type S | (170 to 1500) °C | 0.40 °C | |
| Type R | (170 to 1500) °C | 0.54 °C | |
| Type N | (130 to 1300) °C | 0.30 °C | |
| Type K | (-150 to 1300) °C | 0.40 °C | |

III. Mechanical

| Parameter/Equipment | Range | CMC ^{2, 4} (±) | Comments |
|-------------------------|---|---|---|
| Force ³ – | | | |
| Tension and Compression | Up to 20.0 lbf Up to 50.0 lbf Up to 150 lbf | 0.24 % 0.22 % 0.20 % | ASTM E4 w/ standard/ dead weights |
| Tension | Up to 10 000 lbf Up to 20 000 lbf Up to 60 000 lbf | 0.059 % 0.062 % 0.061 % | ASTM E4 w/ proving rings |
| | (66.4 to 1500) lbf (816 to 12 000) lbf | 0.086 % 0.051 % | ASTM E4 w/S beam load cell |
| | (26 to 1000) lbf (200 to 10 000) lbf (800 to 25 000) lbf | 0.042 % 0.049 % 0.041 % | ASTM E4 w/Interface load cell |
| Compression | Up to 10 000 lbf Up to 20 000 lbf Up to 60 000 lbf Up to 300 000 lbf | 0.059 % 0.075 % 0.098 % 0.23 % | ASTM E4 w/proving rings |
| | (20 to 1000) lbf (200 to 10 000) lbf (796 to 25 000) lbf | 0.056 % 0.047 % 0.048 % | ASTM E4 w/Interface load cell |

| Parameter/Equipment | Range | CMC ^{2,4} (±) | Comments |
|---|--|--|---|
| Force ³ – (cont) Compression | (26 to 1000) lbf (400 to 10 000) lbf (800 to 25 000) lbf | 0.051 % 0.080 % 0.069 % | ASTM E4 w/Interface load cell |
| Vacuum, Pressure and Burst Systems ³ – Pneumatic | (15 to 100) kPa (2.00 to 2.15) MPa (100 to 600) psi (605 to 3000) psi | 0.16 kPa (0.0025 MPa) 0.50 psi 1.3 psi | ASTM D6521, AASHTO R28 ASME B40, ASTM D1599 |
| Alignment ³ – Course | 40 % or Less | 1.7 % | ASTM E1012 w/ strain gage |
| Weights ³ | (2 to 100) g (150 to 454) g 2 lb (0.5 to 5.00) lb (10 to 30) lb 40 lb | 0.0011 g 0.0011 g 0.000 051 lb 0.000 091 lb 0.0006 lb 0.0033 lb | ASTM E4, AASHTO T313 Excluding the 2 lb weight |
| Bending Beam Rheometer Cal Kit ³ – | | | |
| Special Weights | 2 g 50 g 100 g | 0.0011 g 0.002 g 0.013 g | AASHTO T313 |
| Step Gage | (0.05 to 0.400) in (0 to 10) mm | 0.000 19 in (0.0047 mm) | |
| Compliant Beam | (0.401 to 6) in (10.0 to 152) mm | 0.0023 in (0.059 mm) | |

IV. Thermodynamics

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|------------------------------------|--------------------------------|----------------------|------------------------------------|
| Temperature ³ – Measure | (-40 to 180) °C | 0.037 °C | Digital monitor w/ Platinum RTD |
| Temperature – Measure | (15 to 30) °C (59 to 86) °F | 0.35 °C 0.63 °F | Fluke 51 w/ thermocouple |

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 w/in 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 In the statement of CMC, percentages are percentage of reading, unless otherwise indicated.



Accredited Laboratory

A2LA has accredited

APPLIED TEST SYSTEMS

Butler, PA

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 April 2017*).



Presented this 17th day of May 2018.

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

President and CEO
For the Accreditation Council
Certificate Number 2132.01
Valid to February 29, 2020

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