



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Calibration Services, Inc.
300 Buttertown Road
Emlenton, PA 16373

Fulfills the requirements of

ISO/IEC 17025:2017

and national standards

ANSI/NCSL Z540-1-1994 (R2002) and
ANSI/NCSL Z540.3-2006 (R2013)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 27 August 2023

Certificate Number: L1174-1



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
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).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

ANSI/NCSL Z540-1-1994 (R2002)

ANSI/NCSL Z540.3-2006 (R2013)

Calibration Services, Inc.

300 Buttertown Road
Emlenton, PA 16373
William W. Stump III
800-793-1870 / 724-867-6664

CALIBRATION

Valid to: **August 27, 2023**

Certificate Number: **L1174-1**

Length – Dimensional Metrology

| Parameter/Equipment | Range | Expanded Uncertainty of Measurement (+/-) | Reference Standard, Method, and/or Equipment |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Dimensional Extensometers and Deflectometers | (0.000 1 to 2) in | 120 μ m | In accordance with ASTM E-83/ISO 9513 Using length comparator |
| Dimensional LVDT and LDT Devices, Dial Indicators | (0.000 1 to 3) in | 120 μ m | In accordance with ASTM D6027 Using length comparator and gage blocks |
| Dimensional Crosshead Displacement | (0.001 to 31) in | (50 + 190L) μ m | In accordance with ASTM E2309 Using Gauge Blocks and Dial Indicators |
| Dimensional Speed Controls | (0 to 0.1) in/min (0.1 to 0.5) in/min (0.5 to 1) in/min (1 to 5) in/min (5 to 20) in/min | 0.003 5 in/min 0.004 7 in/min 0.029 in/min 0.029 in/min 0.11 in/min | In accordance with ASTM E2658 |


Mass and Mass Related

| Parameter/Equipment | Range | Expanded Uncertainty of Measurement (+/-) | Reference Standard, Method, and/or Equipment |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|
| Force in Compression ¹ Mechanical Testing Machines and Force Measurement Devices | (60 to 800 000) lbf | 0.18 lbf + 0.15 % of reading | In accordance with ASTM E4 using Loading Cells |
| Force in Tension Mechanical Testing Machines and Force Measurement Devices | (45 to 60 000) lbf (45 to 250 000) lbf ³ | 0.18 lbf + 0.15 % of reading | In accordance with ASTM E4 using Loading Cells |
| Force in Compression and Tension ¹ Mechanical Testing Machines and Force Measurement Devices | (0.01 to 45 359) gf | 0.003 gf + 0.015 % of reading | In accordance with ASTM E4 using Dead Weights |
| Laboratory Balance / Scales Resolution 0.01 g Resolution 0.1 g Resolution 0.01 lb Resolution 0.1 lb | Up to 200) g (200 to 2000) g Up to 10 lb (10 to 100) lb | 0.013 g 0.13 g 0.013 lb 0.12 lb | ASTM E-898 and CSI Procedure CAL 10.02A |
| Pressure Transducers and Digital/Analog Pressure Gauges | (1 to 10 000) psi | 0.005 psi + 0.15 % of reading | In accordance with CSI Procedure CAL 2.02A and ASTM D5720 |
| Low Pressure and Vacuum Devices | (0 to 29.5) inHg | 0.04 inHg – 0.15 % of reading | In accordance with CSI Procedure CAL 2.02A |

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. L = length in inches.
3. Tension by transfer.
4. The CMC for scales and balances are highly dependent upon the resolution of the unit under test. The uncertainty presented here does not include the resolution of the unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
5. This scope is formatted as part of a single document including Certificate of Accreditation No. L1174-1.



R. Douglas Leonard Jr., VP, PILR SBU