



THE AMERICAN ASSOCIATION FOR  
LABORATORY ACCREDITATION

## ACCREDITED LABORATORY

A2LA has accredited

**MICRO LABORATORIES, INC.**

**Mentor, OH**

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/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009*).

Presented this 30<sup>th</sup> day of June 2009.

A handwritten signature in cursive script, reading "Peter Abney", positioned above a horizontal line.

President  
For the Accreditation Council  
Certificate Number 1312.01  
Valid to July 31, 2011



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

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

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CALIBRATION

Valid To: July 31, 2011

Certificate Number: 1312.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1</sup>:

I. Dimensional

| Parameter/Equipment       | Range                            | Best Uncertainty <sup>2,4</sup> ( $\pm$ )   | Comments                         |
|---------------------------|----------------------------------|---|----------------------------------|
| Squareness                | (0 to 0.008) in                  | 53 $\mu$ in                                 | Square master                    |
| Gage Blocks               | (0.01 to 4.0) in<br>(5 to 20) in | (3.5 + 2L) $\mu$ in<br>(24 + 1.1L) $\mu$ in | Mechanical comparison            |
| Height Gages <sup>3</sup> | (1 to 60) in                     | (70 + 4L) $\mu$ in                          | Height master                    |
| Ring Gages (ID)           | (0.06 to 12) in                  | (21 + 8.3L) $\mu$ in                        | Ring comparator                  |
| Plug Gages (OD)           | (0.001 to 4) in                  | (12 + 8.4L) $\mu$ in                        | Supermicrometer <sup>TM, 5</sup> |
| Pin Gages (OD)            | (0.001 to 4) in                  | (12 + 8.4L) $\mu$ in                        | Supermicrometer <sup>TM, 5</sup> |
| Indicators <sup>3</sup>   | (0.000 02 to 1) in               | (0.000 03 + 6.5L) $\mu$ in                  | Indicator calibrator             |
| Micrometers <sup>3</sup>  | (0.05 to 36) in                  | (94 + 3.5L) $\mu$ in                        | Gage blocks/optical flats        |

| Parameter/Equipment                                    | Range                           | Best Uncertainty <sup>2,4</sup> ( $\pm$ ) | Comments  |
|--|---------------------------------|---|---|
| Calipers <sup>3</sup>                                  | (0.05 to 60) in                 | (620 + 3.5L) $\mu$ in                     | Gage blocks/height gage                           |
| Micrometer Setting Standards                           | (1 to 20) in                    | (15 + 4L) $\mu$ in                        | Optical height gage and Mu checker                |
| Micrometer Setting Masters and Caliper Setting Masters | (1 to 60) in                    | (40 + 4L) $\mu$ in                        | Height gage, Mu checker, and surface plate        |
| Thread Wires   | (2 to 120) TPI                  | (10 + 5.4L) $\mu$ in                      | Supermicrometer <sup>TM, 5</sup>                  |
| Gear Wires –<br>Pitch                                  | (1 to 200) pitch                | (10 + 5.4L) $\mu$ in                      | Supermicrometer <sup>TM, 5</sup>                  |
| Snap Gages <sup>3</sup>                                | (0.125 to 20) in                | (120 + 4.8L) $\mu$ in                     | Gage blocks                                       |
| Thread Plug Gages                                      | (2 thru 120) TPI<br>Up to 12 in | (81 + 4.6L) $\mu$ in                      | Supermicrometer <sup>TM, 5</sup> and thread wires |
| Parallels  | Up to 36 in                     | (66 + 32L) $\mu$ in                       | Surface plate and indicator                       |
| Supermicrometers <sup>TM, 3, 5</sup>                   | (0 to 48) in                    | (15 + 9.1L) $\mu$ in                      | Gage blocks and force gage                        |
| Taper Pipe Thread Plugs                                | (0.062 to 3.0) in               | (130 + 4.6L) $\mu$ in                     | Supermicrometer <sup>TM, 5</sup> and thread wires |
| Taper Pipe Thread Rings                                | (0.062 to 3.0) in               | 170 $\mu$ in                              | Master plugs                                      |
| Steel Rules/Tapes                                      | Up to 100 ft                    | 0.0029 in                                 | Optical vision measuring system                   |

| Parameter/Equipment         | Range                         | Best Uncertainty <sup>2, 4</sup> ( $\pm$ ) | Comments           |
|-----------------------------|-------------------------------|--|--------------------|
| Thread Rings                | (2 to 120) TPI<br>Up to 12 in | 140 $\mu$ in                               | Set plugs          |
| Surface Roughness Standards | (2 to 500) $\mu$ in           | 3.5 $\mu$ in                               | Roughness analyzer |

## II. Dimensional Testing

| Parameter          | Range           | Best Uncertainty <sup>2, 4</sup> ( $\pm$ ) | Comments                               |
|--------------------|-----------------|--|--|
| Height/Diameter    | (0 to 60) in    | (70 + 4L) $\mu$ in                         | Height gage, indicator and gage blocks |
| ID Diameter        | (0.06 to 12) in | (21 + 8.3L) $\mu$ in                       | Comparator                             |
| OD Diameter/Length | (0 to 36) in    | (10 + 5.4L) $\mu$ in                       | Supermicrometer <sup>TM, 5</sup>       |
| Squareness         | (0 to 0.008) in | 53 $\mu$ in                                | Surface plate and squaremaster         |
| Parallelism        | Up to 36 in     | (66 + 32L) $\mu$ in                        | Surface plate and height gage          |

## III. Mechanical

| Parameter  | Range               | Best Uncertainty <sup>2</sup> ( $\pm$ ) | Comments                          |
|--|---------------------|---|-----------------------------------|
| Torque Measuring Equipment –<br>Wrenches and Watches | (4 to 12 000) in·lb | 2.6 % of range                          | Digital torque tester with loader |

| Parameter                                      | Range   | Best Uncertainty <sup>2</sup> (±) | Comments                   |
|--|---|-----------------------------------|----------------------------|
| Torque – Measure<br>Testers and<br>Transducers | 0.1 in-oz to 500 ft-lb<br>(500 to 1000) in-lb | 0.1 % of range<br>0.1 % of range  | Torque arms and<br>weights |
| Force Gages –<br>Tension                       | Up to 300 lbs                                 | 0.08 % of range                   | Weights                    |

<sup>1</sup> This laboratory offers commercial and field calibration service.

<sup>2</sup> “Best Uncertainty” 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 of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer’s device and to influences from the circumstances of the specific calibration.

<sup>3</sup> 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 uncertainties achievable on a customer’s site can normally be expected to be larger than the Best Measurement Capabilities (BMC) that the accredited laboratory has been assigned as Best Uncertainty 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 uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the calibration uncertainty being larger than the BMC.

<sup>4</sup> In the statement of best uncertainty,  $L$  is the numerical value of the nominal length of the device measured in inches.

<sup>5</sup> "Supermicrometer" is a registered trade mark owned by Pratt & Whitney Measurement Systems, Inc., Connecticut U.S.A.