



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

CANADIAN CENTRAL GAUGE LABORATORY

Brampton, CANADA

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 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 15th day of December 2010.



A handwritten signature in black ink, appearing to read "Peter Meyer", written over a horizontal line.

President & CEO
For the Accreditation Council
Certificate Number 1165.01
Valid to January 31, 2013

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

CANADIAN CENTRAL GAUGE LABORATORY
 40 West Drive
 Brampton, Ontario, Canada L6T 3T6
 Hilliard Cox Phone: 905 457 9190

CALIBRATION

Valid To: January 31, 2013

Certificate Number: 1165.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,4}:

I. Dimensional

| Parameter/Equipment | Range | CMC ^{2,5} (±) | Comments |
|--|--|--|----------------------------------|
| Gage Blocks – Steel, Ceramic, Carbide, Chrome Carbide Length Flatness Parallelism Length Flatness Parallelism | (0.5 to 100) mm (0.010 to 4) in | (0.075 + 0.025L) µm 0.1 µm 0.05 µm (3 + 1L) µin 4 µin 2 µin | ANSI B89.1.9 |
| Plain Plug Gages – Thread Measure Wire | (0.007 to 4) in (>4 to 24) in Up to 80 TPI | (4 + 1.5L) µin (10 + 3L) µin 4 µin | ANSI B89.1.5 ANSI B891.17 |
| Plain Ring Gages | (0.04 to 6) in (6 to 12) in | (7 + 1.5L) µin (15 + 1.5L) µin | ANSI B89.1.6M |

| Parameter/Equipment | Range | CMC ^{2,5} (\pm) | Comments |
|---|--|---|--|
| Micrometers – Outside ³ Height Setting ³ High Resolution | Up to 1 in (2 to 36) in (6 to 24) in Up to 4 in | (0.6R + 10L) μ in (0.6R + 5L) μ in (0.6R + 10L) μ in 10 μ in | By comparison |
| Depth Gages ³ | (1 to 24) in | (0.6R + 10L) μ in | By comparison |
| Squares | 18 in | 20 μ in/in | Square checker |
| Thread Plug Gages – Simple Pitch Diameter Linear Pitch Variation Flank Angle | Up to 4 in (4 to 12) in Up to 16 in Up to 16 in | 85 μ in (85 + 5L) μ in 35 μ in per 4 in 3 min of arc depending on pitch | By comparison Helical path analyzer or ULM Optical comparator |
| Thread Ring Gages – Adjustable Type Functional Pitch Diameter Flank Angle | (0.06 to 12) in (0.06 to 12) in | (320 + 15L) μ in 3 min of arc depending on pitch | By comparison, fit to master plug By cast method |

| Parameter/Equipment | Range | CMC ^{2, 5} (±) | Comments |
|--|----------------------|---------------------------------|--|
| Thread Ring Gages – Non-Adjustable Type | | | |
| Simple Pitch Diameter | (0.5 to 6) in | 120 μin | By comparison |
| Lead Variation | (0.5 to 2) in | 25 μin per 4 in | |
| Flank Angle | (0.5 to 2) in | 3 min of arc depending on pitch | By cast method |
| Thread Caliper Gauges – Adjustable | | | |
| Knife Edge | Up to 12 in | (420 + 5L) μin | Fit to master |
| Roller Type | Up to 12 in | (250 + 10L) μin | |
| Vernier, Dial, and Digital Calipers ³ | Up to 60 in | (0.6R + 4.5L) μin | By comparison |
| Dial, Digital, and Test Indicators – | Up to 2 in | 30 μin | ANSI B89.1.10M |
| Hi-Resolution/Digital | (0.001 to 0.05) in | 1.2 μin | |
| Hi-Resolution/Analog | Up to 0.1 in | 4.5 μin | |
| Bore Gages | (0.5 to 24) in | (0.6R + 3L) μin | By comparison |
| Length Standards – Setting Rods | (1 to 36) in | (6 + 4.5L) μin | By comparison |
| Surface Plates ³ | Up to 20 ft diagonal | (50 + 4D) μin | GGG-P-463c; D is the length of the diagonal in feet. |

| Parameter/Equipment | Range | CMC ^{2, 5} (±) | Comments |
|---|---|---|---|
| Optical Comparators ³ – Magnification Linearity Angle | Up to 100 x 18 in travel Up to 360° | Lens: < 1% magnification 200 µin Angle: 2.7 min | Opti-master, mag rule, angle blocks, balls |
| High Resolution Comparators | 2 in | 1.5 µin | Master blocks |
| Digital, Dial, and Vernier Height Gauges ³ | (6 to 48) in | (0.6R + 4.5L) µin | By comparison |
| Sine Bars and Plates | Up to 10 in | 15 µin/5 in | By comparison |
| Precision Levels | Up to 20 in | (0.6R + 5.5) µin | Level test rig |
| Autocollimator | 5 min | 0.31 arc sec | Blks/sine equipment |
| Plain Snap Gages ³ | Up to 12 in | (120 + 3L) µin | By comparison |
| Steel Rules | Up to 24 in | 0.003 in | Optical Comparator |

II. Mechanical

| Parameter | Range | CMC ² (±) | Comments |
|---|------------------------------|----------------------------------|---|
| Indirect Verification of Rockwell Hardness Testers ³ | HRA Low Medium High | 0.44 HRA 0.24 HRA 0.17 HRA | Indirect verification method per ASTM E18 |

| Parameter | Range | CMC ^{2,5} (±) | Comments |
|--|-------------|------------------------|---|
| Indirect Verification of Rockwell Hardness Testers ³ – (cont) | HRB | | Indirect verification method per ASTM E18 |
| | Low | 1.1 HRB | |
| | Medium | 0.65 HRB | |
| | High | 11 HRB | |
| | HRC | | |
| | Low | 0.38 HRC | |
| | Medium | 0.33 HRC | |
| | High | 0.31 HRC | |
| | HREW | | |
| | Low | 0.50 HREW | |
| | Medium | 0.57 HREW | |
| | High | 0.54 HREW | |
| | HR15N | | |
| | Low | 0.47 HR15N | |
| Medium | 0.24 HR15N | | |
| High | 0.24 HR15N | | |
| HR15T | | | |
| Low | 0.46 HR15T | | |
| Medium | 0.38 HR15T | | |
| High | 0.33 HR15T | | |
| HR30N | | | |
| Low | 0.42 HR30N | | |
| Medium | 0.28 HR30N | | |
| High | 0.27 HR30N | | |
| HR30TW | | | |
| Low | 0.53 HR30TW | | |
| Medium | 0.32 HR30TW | | |
| High | 0.31 HR30TW | | |
| HR45N | | | |
| Low | 0.48 HR45N | | |
| Medium | 0.59 HR45N | | |
| High | 0.23 HR45N | | |
| HR45TW | | | |
| Low | 0.62 HR45TW | | |
| Medium | 0.44 HR45TW | | |
| High | 0.41 HR45TW | | |
| Torque Tools ³ | 450 ft·lb | 1.0 % IV | Torque tester |
| Torque Testers | 5500 in·lb | 0.16 % IV | Standard weights |

| Parameter | Range | CMC ^{2,5} (\pm) | Comments |
|--------------------------------------|--|------------------------------|-------------------------------------|
| Force Gauges | 250 lb | 1.5 % IV | By comparison with standard weights |
| Direct Verification of Durometers – | Shore Types A, B, C, D, DO, M, O, and OO | | ASTM D 2240 |
| Indenter Shape and Extension: | | | |
| Extension at Zero | --- | 0.0003 in | |
| 35° Conical Frustum Indentor | Diameter at frustum base | 0.0003 in | |
| | Diameter at top of frustum | 0.0003 in | |
| | Cone angle | 8 arcmin | |
| 30° Cone Indentor | Diameter at base of cone | 0.0003 in | |
| Indenter Shape and Extension: | | | |
| 1.2 mm Radius Indentor | Cone angle | 8 arcmin | |
| | Tip Radius | 0.0003 in | |
| | Indentor diameter | 0.0002 in | |
| | Indentor radius | 0.0003 in | |
| Verification of the Durometer Spring | --- | 1.6 grams | Durocalibrator |

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability (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. Calibration and Measurement Capabilities 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 This laboratory offers metric equivalent capability for all items listed.

⁵ In the statement of best uncertainty, L is the numerical value of the nominal length of the device measured in inches; R is the numerical value of the resolution of the device in microinches; D is the numerical value of the nominal diameter of the device measured in inches except where noted; IV is the percent of indicated value.