



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

MITUTOYO AMERICA CORPORATION (MAC) FIELD SERVICE

Aurora, IL

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 18th day of March 2010.



Peter Abney

President & CEO
For the Accreditation Council
Certificate Number 1643.01

Valid to February 29, 2012

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

MITUTOYO AMERICA CORPORATION (MAC) FIELD SERVICE
958 Corporate Blvd.
Aurora, IL 60504
Daniel Dikun Phone: 630 820 9590

CALIBRATION

Valid To: February 29, 2012

Certificate Number: 1643.01

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, 4} (±)	Comments
CMMs ³ – Length Length Probe Performance	(0 to 40) in (0 to 200) in (0.4 to 2) in sphere diameter	(1.3 + 0.2L) μin (4 + 1.3L) μin 1 μin	In accordance with ISO 10360-2: Step gage/gage blocks Laser Sphere
Vision Instruments ³ – Length Squareness Video Probe	(0 to 650) mm (0 to 800) mm (0 to 150) mm (0 to 200) mm (0 to 400) mm (0 to 600) mm (0.02 to 4) mm	(0.05 + 0.14L) μm (0.5 + 0.14L) μm (0.09 + 3.8L) μm (0.2 + 3.5L) μm (0.2 + 3.9L) μm (0.2 + 4.1L) μm 0.5 μm	Linescale Gage blocks Steel/ceramic square Pixel chart

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Vision Instruments ³ – (cont)			
Magnification Offset	0.5x to 30x	1.2 µm	Pixel chart
Surface and Form Measuring Instruments ³ –			
Detector Accuracy	(-25 to +25) mm	(0.05 + 0.8L) µm	Gage blocks
Straightness	(0 to 350) mm	0.02 µm	Straight edge
Radial Motion	0° to 360°	0.005 µm	Precision sphere
Axial Motion	0° to 360°	0.001 µm	
Parallelism	(0 to 200) mm	0.13 µm/m	Cylindrical square
Squareness	(0 to 100) mm	0.28 µm/m	Square reversal
Indirect Verification of Surface Finish	(0 to 5) µm Ra	0.05 µm	Surface finish patch
Length	(0 to 200) mm	(0.25 + 1.2L) µm	Pitch gage
Profile Projectors ³ –			
Squareness	(0 to 150) mm	14 µm	Steel square
Length	(0 to 300) mm	10 µm	Glass scale
Magnification	0x to 50x	17 µm/m	Glass scale

II. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers	HRA: (80 to 93) HRA (70 to 79) HRA (60 to 69) HRA HRB: (80 to 130) HRB (51 to 79) HRB (1 to 50) HRB HRC: (60 to 70) HRC (40 to 59) HRC (20 to 39) HRC HRD: (70 to 80) HRD (50 to 69) HRD (40 to 49) HRD HR30N: (77 to 85) HR30N (60 to 76) HR30N (40 to 59) HR30N HR30T: (57 to 85) HR30T (50 to 56) HR30T (20 to 49) HR30T	0.17 HRA 0.18 HRA 0.29 HRA 0.43 HRB 0.87 HRB 1.4 HRB 0.32 HRC 0.33 HRC 0.38 HRC 0.19 HRD 0.26 HRD 0.28 HRD 0.28 HR30N 0.28 HR30N 0.55 HR30N 0.40 HR30T 0.67 HR30T 0.91 HR30T	ASTM E18
Indirect Verification of Vickers Hardness Testers ≥ 1 kgf ≤ 1 kgf	(170 to 200) HV (200 to 400) HV (400 to 700) HV (170 to 200) HV (200 to 400) HV (400 to 700) HV	3.0 HV 4.0 HV 7.0 HV 4.0 HV 8.0 HV 17 HV	ASTM E92
Indirect Verification of Knoop Hardness Testers	(170 to 200) HK (200 to 400) HK (400 to 700) HK	6.0 HK 7.7 HK 16 HK	ASTM E384

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 In the statement of Calibration and Measurement Capability, L is the numerical value of the nominal length of the device measured in inches or meters.