SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

DIMENSIONAL MEASUREMENT, INC.
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CALIBRATION

Valid until: December 31, 2012 Certificate Number: 2503.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Dimensional

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Bore Gages (2-point ID Micrometer)	Up to 500 mm (To 1 µm resolution)	Larger of 0.6*R* or (0.61 + 0.006*L*) µm	Gage block comparison
Bore Gages (2-point ID Micrometer)[3]	Up to 500 mm (To 1 µm resolution)	Larger of 0.6*R* or (0.61 + 0.011*L*) µm	Gage block comparison
Calipers	Up to 800 mm (To 10 µm resolution)	Larger of 0.6*R* or (6.0 + 0.006*L*) µm	Gage block comparison
Calipers[3]	Up to 800 mm (To 10 µm resolution)	Larger of 0.6*R* or (6.0 + 0.011*L*) µm	Gage block comparison
Calipers	Up to 2000 mm (To 10 µm resolution)	Larger of 0.6*R* or (7.1 + 0.015*L*) µm	CMM
Depth Micrometers	Up to 500 mm	Larger of 0.6*R* or (6.0 + 0.006*L*) µm	Gage block comparison
Depth Micrometers[3]	Up to 500 mm	Larger of 0.6*R* or (6.0 + 0.011*L*) µm	Gage block comparison

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Dial & Digital Indicators	Up to 500 mm (To 1 µm resolution)	Larger of 0.6*R* or (0.60 + 0.006*L*) µm	Gage block comparison
Dial & Digital Indicators[3]	Up to 500 mm (To 1 µm resolution)	Larger of 0.6*R* or (0.61 + 0.008*L*) µm	Gage block comparison
Feeler Gages/Taper Gages[3]	Up to 25 mm	0.6 µm	Micrometer
Gage Balls – Diameter	Up to 100 mm	(1.0 + 0.006*L*) µm	Bench micrometer
Height Gages – (to 0.02 mm resolution)	Up to 800 mm	Larger of 0.6*R* or (12 + 0.006*L*) µm	Gage block comparison
Height Gages[3] – (to 0.02 mm resolution)	Up to 800 mm	Larger of 0.6*R* or (12 + 0.011*L*) µm	Gage block comparison
Height Gages – (to 0.02 mm resolution)	Up to 800 mm Up to 2000 mm	Larger of 0.6*R* or (12 + 0.008*L*) µm Larger of 0.6*R* or (13 + 0.013*L*) µm	CMM
Height Masters	Up to 500 mm	Larger of 0.6*R* or (1.2 + 0.006*L*) µm	Gage block comparison
Height Masters[3]	Up to 500 mm	Larger of 0.6*R* or (1.2 + 0.011*L*) µm	Gage block comparison
Micrometers[3]	(0 to 50) mm (75 to 175) mm (200 to 500) mm	Larger of 0.6*R* or (2.1 + 0.006*L*) µm Larger of 0.6*R* or (5.1 + 0.006*L*) µm Larger of 0.6*R* or (10 + 0.006*L*) µm	Gage block comparison

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Micrometers	Up to 1000 mm	Larger of 0.6*R* or (2.1 + 0.01*L*) µm	CMM
Micrometer Standards	Up to 500 mm	(0.84 + 0.006*L*) µm	Gage block comparison
Micrometer Standards[3]	Up to 500 mm	(0.67 + 0.011*L*) µm	Gage block comparison
Micrometer Standards	Up to 1000 mm Up to 2000 mm	(1.2 + 0.001*L*) µm (3.6 + 0.012*L*) µm	CMM
Parallels – Flatness and Parallelism	Up to 2400 x 1200 mm	(2.0 + 0.010*L*) µm	Surface plate
Parallels – Flatness and Parallelism[3]	Up to 2400 x 1200 mm	(1.4 + 0.009*L*) µm	Surface plate
Pin and Plug Gages	Up to 100 mm	(0.32 + 0.006*L*) µm	Micrometer
Pin and Plug Gages[3]	Up to 100 mm	(0.32 + 0.01*L*) µm	Micrometer
Profilometers – Indirect Verification of Vertical Magnification, Fixed Points[3]	≈ 1 µm *Ra* ≈ 3 µm *Ra*	0.090 *Ra* + R* 0.090 *Ra* + R*	Roughness standards R* is the repeatability of the instrument
Protractors to 5' graduations (arcsec + arcesec/A)	Up to 360º	172" + 147"/A	CMM
Radius Gages	Up to 300 mm	(6.0 + 0.047*L*) µm	Video inspection machine
Step/Riser Blocks	Up to 500 mm	(0.33 + 0.006*L*) µm	Gage block comparison

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Step Riser Blocks[3]	Up to 500 mm	(0.33 + 0.01*L*) µm	Gage block comparison
Step Riser Blocks	Up to 800 mm Up to 2000 mm	(1.8 + 0.008*L*) µm (3.2 + 0.012*L*) µm	CMM
Rules – Length	Up to 400 mm Up to 2000 mm	(6.0 + 0.047*L*) µm (3.2 + 0.012*L*) µm	Video inspection machine CMM
Square	Up to 800 mm Up to 2000 mm	(2.2 + 0.009*L*) µm (3.2 + 0.011*L*) µm	CMM
Straight Edge – Straightness	Up to 2600 mm	(1.4 + 0.006*L*) µm	Surface plate
Straight Edge – Straightness[3]	Up to 2600 mm	(1.4 + 0.009*L*) µm	Surface plate
Vee Blocks –			
Centrality	Up to 500 mm	(1.4 + 0.006*L*) µm	Gage block comparison
Parallelism	Up to 1000 mm x 1000 mm	(1.4 + 0.005*L*) µm	Surface plate
Vee Blocks[3] –			
Centrality	Up to 500 mm	(1.4 + 0.011*L*) µm	Gage block comparison
Parallelism	Up to 1000 mm x 1000 mm	(1.4 + 0.009*L*) µm	Surface plate

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Thread Plugs	(1.5 to 100) mm	(0.5 + 0.02*L*) µm	Bench micrometer

II. Dimension Testing/Calibration

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Length – 1D[5]	Up to 500 mm	(0.84 + 0.006*L*) µm	Gage block comparison
3D Point-to-Point Distance and Location	Up to (1000 x 800 x 700) mm	(2.2 + 0.009*L*) µm	CMM
	Up to (2000 x 1200 x 1000) mm	(4.8 + 0.011*L*) µm	CMM
	Up to (300 x 300 x 200) mm	(6.0 + 0.047*L*) µm	Video inspection machine
3D Full Feature-to-Feature Distance and Location, including Holes, Shafts and Spheres, not requiring PH10 Movement	Up to (1000 x 800 x 700) mm	(1.2 + 0.009*L*) µm	CMM
	Up to (2000 x 1200 x 1000) mm	(3.2 + 0.011*L*) µm	CMM
	Up to (300 x 300 x 200) mm	(6.0 + 0.047*L*) µm	Video inspection machine
Length – 1D[3, 5]	Up to 500 mm	(0.84 + 0.01*L*) µm	Gage block comparison
3D Point-to-Point Distance and Location	Up to 3600 mm diameter sphere	(62 + 0.09*L*) µm	Faro arm
3D Full Feature-to-Feature Distance and Location, Including Holes, Shafts and Spheres, not requiring PH10 Movement	Up to 3600 mm diameter sphere	(62 + 0.09*L*) µm	

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Angle (arcsec + arcsec/A)[5]	(0 to 360)º	2.8″ + 0.81″/A	CMM
Angle (arcsec + arcsec/A)[3, 5]	(0 to 360)º	45″ + 23″/A	CMM
Surface Finish[5]	≈ 1 µm *Ra* ≈ 3 µm *Ra*	0.090 *Ra* + R* 0.090 *Ra* + R*	Profilometer, R* is the repeatability of the instrument

[1] This laboratory offers commercial calibration/dimensional testing service and field calibration/ dimensional testing 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 CMC, *L* is the numerical value of the nominal length of the device measured in millimeters; *A* is the numerical value of the length of the shortest leg that defines the angle in meters; *R* is the numerical value of the resolution of the device; *Ra* is the numerical value of the nominal roughness of the surface measured in micrometers roughness.

[5] This laboratory meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program* for the types of dimensional tests listed above and is considered equivalent to that of a calibration certificate.

The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

DIMENSIONAL MEASUREMENT, INC.

Wixom, MI

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 30th day of December 2010.

President & CEO
For the Accreditation Council
Certificate Number 2503.01
Valid to December 31, 2012

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