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

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CALIBRATION

Valid To: March 31, 2018 Certificate Number: 3039.01

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
Caliper Master	Up to 12 in	(94 + 2.8*L*) µin	Electronic height gage, electronic indicator
Calipers[3]	Up to 60 in	(700 + 8.5*L*) µin	Gage blocks
Cylindrical Plug Gages, Master Discs, Pin Gages	(0.01 to 5) in (5 to 15) in	(47 + 6.1*D*) µin (47 + 3.6*D*) µin	Bench micrometer Gage blocks
Depth Micrometers[3]	Up to 12 in	(200 + 1.8*L*) µin	Depth micrometer master
Feeler Gages	Up to 0.500 in	36 µin	Bench micrometer
Height Gages[3]	Up to 24 in	(57 + 4*L*) µin	Master height gage
Micrometers, Inside Diameter[3]	Up to 48 in	(210 + 22*L*) µin	Bench micrometer

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Indicators[3]	Up to 4 in	42 µin	Indi check gage
Micrometer Master, Outside Diameter	Up to 6 in (6 to 12) in	(130 + 1.2*L*) µin (130 + 1.3*L*) µin	Bench micrometer, master height gage
Length Standards, 1D	Up to 48 in	(61 + 14*L*) µin	Bench micrometer, master height gage
Micrometers, Outside Diameter [3] – Indicating	Up to 24 in Up to 4 in	(130 + 17*L*) µin (88 + 1.4*L*) µin	Gage blocks
Optical Comparators[3] – Magnification	5 x 5 in 10x, 20x, 50x, 100x	210 µin (190 + 0.37*L)* µin	Glass scales, tooling balls
Parallels	Up to 24 in	(29 + 3.2*L*) µin	Electronic indicator
Plain Ring Gages	(0.06 to 1.125) in (1.125 to 12) in	(15 + 2.8*D*) µin (18 + 5*D*) µin	Federal internal, Zeiss OKM
Rules	Up to 72 in	1800 µin	Zeiss instrument
Squares	Up to 12 in	74 µin	Squaremaster
Super Micrometers[3]	Up to 10 in	(36 + 4.8*L*) µin	Gage blocks, optical flats
Thread Plug Gages – Pitch Lead Angle	 (0.06 to 10) in (0 to 360)°	 (96 + 6.5*D*) µin 6’ 40”	Bench micrometer, thread wires

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Thread Ring Gages –	(0.060 to 0.3125) in	(260 + 200*D*) µin	Contour reader, master plug
Pitch	(0.3125 to 10) in	(360 + 73*D*) µin	
Lead	(0.3125 to 10) in	280 µin	
Minor	(0.3125 to 10) in	(110 + 3.5*D*) µin	
Angle	(0 to 360)°	33’	
Depth Micrometer Master[3]	Up to 12 in	(120 + 3.6*L*) µin	Height master, electronic indicator
Plain Tapered Plugs	Up to 6 in	(67 + 4.0*D*) µin	Bench micrometer
Plain Tapered Rings	Up to 2 in	(130 + 2*D*) µin	Master plugs
Tapered Thread Plugs –			
Pitch Diameter & Lead	(0.060 to 6) in	(96 + 3.1*D*) µin	Bench micrometer, measuring wires
Angle	(0 to 360)°	6’	
Taper	(0.060 to 6) in	(68 + 2.9*D*) µin	
Tapered Thread Rings –			
Pitch Diameter	(0.060 to 6) in	(600 + 200*D*) µin	Countour reader, master plugs, height gage
Lead	(0.060 to 6) in	340 µin	
Angle	(0 to 360)°	33’	
Taper	(0.060 to 6) in	(140 + 1.8*L*) µin	

II. Dimensional Testing/Calibration[1]

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Luer Tapered Rings[5] –			
Length	Up to 50 mm	(1.2 + 0.0037*L*) µm	Master plug, height gage, ISO 594/1 3a & 3b
Small Diameter	Up to 50 mm	3.9*D* µm	
Large Diameter	Up to 50 mm	1.5*D* µm	
Luer Tapered Plugs[5] –			
Length	Up to 50 mm	1.7*D* µm	Bench micrometer, measuring wires, height gage, ISO 594/1 3c
Small Diameter	Up to 50 mm	1.8*D* µm	
Large Diameter	Up to 50 mm	1.2*L* µm	
Luer Ref Conical Fitting[5] –			
Diameter	Up to 50 mm	6.3 µm	Countour reader, comparator, height gage, ISO 594/2 Fig 5 & Fig 6
Length	Up to 50 mm	1.2 µm	
Angle	Up to 50 mm	1.2’	
Luer Ref Conical Fitting[5] –			
Interior Diameter	7.0 mm ID	1.5D_L µm	Countour reader, vision machine, height gage, ISO 594/2 Fig 7
Interior Diameter	7.9 mm ID	8.5D_L µm	
Angles	Up to 360°	1.2’	
Luer Ref Conical Fitting[5] –			
Interior Diameter	7.0 mm ID	1.9D_L µm	Countour reader, vision machine, height gage, ISO 594/2 Fig 8
Interior Diameter	7.9 mm ID	8.5D_L µm	
Angles	Up to 360°	1.2’	
Luer Ref Steel Male Conical Fitting[5] –			
Diameter	Up to 50 mm	1.7D_L µm	Bench micrometer, measuring wires, ISO 594/1 Fig 5
Length	Up to 50 mm	2.2L_L µm	
Luer Ref Steel Female Conical Fitting[5] –			
Diameter	Up to 50 mm	1.5D_L µin	Master plugs, ISO 594/1 Fig 4
Length	Up to 50 mm	(1.2 + 0.0037L_L) µin	

[1] This laboratory offers commercial dimensional testing/calibration service and field calibration service.

[2] Calibration and Measurement Capability Uncertainty (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. CMCs 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 inches. D is the numerical value of the nominal diameter of the device measured in inches. L_L is the numerical value of the nominal length of the device measured in millimeters. D_L is the numerical value of the nominal diameter of the device measured in millimeters.

[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.