



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017  
& ANSI/NCSL Z540-1-1994

CAL-LABS  
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CALIBRATION

Valid To: June 30, 2023

Certificate Number: 1672.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1, 6</sup>:

I. Dimensional

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Caliper Checker	Up to 6 in Up to 14 in	34 µin 62 µin	Height master, electronic indicator
Calipers <sup>3</sup> –  Dial & Digital	Up to 12 in (12 to 24) in (24 to 48) in (48 to 80) in	0.000 42 in 0.000 48 in 0.000 88 in 0.0013 in	Gage blocks and ring gage
Vernier	Up to 24 in (24 to 48) in (48 to 60) in (60 to 80) in	0.0006 in 0.0011 in 0.0013 in 0.0015 in	
Jaw Parallelism Dial & Digital Vernier		0.000 41 in 0.000 60 in	Cylindrical plug

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Cylindrical Plugs <sup>3</sup> –  Class X, XX  Class Y, Z, ZZ or Unmarked	Up to 1 in (1 to 2) in (2 to 3) in (3 to 4) in (4 to 5) in  Up to 1 in (1 to 2) in (2 to 3) in (3 to 4) in (4 to 5) in	9.0 μin 13 μin 15 μin 17 μin 24 μin  30 μin 40 μin 43 μin 47 μin 53 μin	Gage blocks, universal Supermicrometer™
Cylindrical Rings <sup>3</sup>	(0.040 to 0.250) in (>0.250 to 1) in (>1 to 3) in (>3 to 10) in	10 μin 9 μin (10 + 1.5D) μin (10 + 2.8D) μin	Gage blocks, master rings, universal Supermicrometer™
Gage Blocks –  Fixed Points	(0.050 to 1) in (1 to 2) in (2 to 3) in (3 to 4) in  5 in 6 in 7 in 8 in 10 in 12 in 16 in 20 in	3.6 μin 4.9 μin 6.3 μin 7.8 μin  14 μin 15 μin 18 μin 19 μin 22 μin 26 μin 33 μin 41 μin	Gage block comparator, master gage block  Electronic indicator, master gage blocks
Height Gages –  Dial, Digital  0.000 050" Resolution  Vernier  Scriber Parallelism	Up to 24 in (25 to 40) in  Up to 24 in  Up to 40 in  All	0.000 35 in 0.000 41 in  0.000 14 in  0.000 60 in  0.000 11 in	Height master, gage blocks, electronic indicator

Parameter/Equipment	Range	CMC <sup>2,4</sup> (±)	Comments
Height Masters –  Column	1 in 2 in 3 in 4 in 5 in 6 in 7 in 8 in 9 in 10 in 11 in 12 in	12 μin 13 μin 13 μin 14 μin 17 μin 19 μin 20 μin 21 μin 23 μin 25 μin 26 μin 28 μin	Master gage blocks, electronic indicator
Head	Up to 1.0 in	19 μin	
Indicator Calibrator <sup>3</sup>	Up to 2 in	27 μin	Gage blocks (grade 0), electronic indicator, optical flat
Indicators <sup>3</sup>	Up to 1 in  MAHR (R: 0.000 02 in)	41 μin  15 μin	Gage blocks, height gage
Micrometers <sup>3</sup> –  Head Accuracy, O.D., Blades, Point, Spline, Tube, Anvil, Disc, Indicating, Interchangeable, Bench	Up to 1 in (>1 to 3) in (>3 to 36) in	61 μin 70 μin (90 + 7L) μin	Gage blocks
Flatness	Up to 36 in	19 μin	Optical parallel
Parallelism	Up to 1 in (1 to 4) in	50 μin 71 μin	Ball tester, cyl. plug Gage blocks, cyl. plug
High Accuracy 0.000 005 in Resolution			
Head Accuracy	Up to 1 in	13 μin	Gage blocks
Parallelism	Up to 1 in	19 μin	Ball tester

Parameter/Equipment	Range	CMC <sup>2,4</sup> (±)	Comments
Micrometer Heads	Up to 2 in	27 µin	Gage blocks and Mahr/electronic indicator
Micrometer Standards	Up to 4 in (5 to 11) in (12 to 36) in	30 µin (30 + 2L) µin (30 + 3L) µin	Laser and P&W measuring machine
Microscopes <sup>3</sup> – Metallurgical, Scope with Reticle			
Scale Factor/Magnification	Up to 100x Up to 200x Up to 500x Up to 1000x	0.20 % of scale factor 0.35 % of scale factor 0.83 % of scale factor 1.8 % of scale factor	Stage micrometer, up to 0.2 in
Vision System	10x to 50x 100x 200x 500x 1000x 1250x 1500x 2000x	0.000 18 in 0.000 11 in 79 µin 56 µin 53 µin 60 µin 63 µin 56 µin	Stage micrometer, up to 0.2 in
Toolmakers, Up to 6 in Stage Travel	20 µin resolution	69 µin	Stage micrometer, up to 6 in
Optical Comparator <sup>3</sup> –			
Stage Travel	Up to 6 in	0.000 16 in	Glass scales
Magnification	10x to 31.25x 50x to 62x 100x	0.025 % of mag 0.048 % of mag 0.075 % of mag	Glass scales with screen overlay scale
Angular/Protractor	(0 to 360)°	3.0'	True square
Chart Alignment	Up to 30 in diameter	0.000 12 in	Stage micrometer
Riser Blocks	6 in 12 in	17 µin 28 µin	Gage blocks, electronic indicator

Parameter/Equipment	Range	CMC <sup>2, 4, 5</sup> ( $\pm$ )	Comments
Rulers	Up to 24 in (>24 to 72) in	0.000 90 in 0.0010 in	P & W measuring machine
Stage Micrometers / Glass Scales	Up to 12 in	51 $\mu$ in	Microscope & laser
Supermicrometer <sup>TM, 3</sup> –  Spindle Meter (Comparator) Parallelism Flatness  Tailstock Force	Up to 1 in     8 oz 16 oz 40 oz	14 $\mu$ in 8 $\mu$ in 16 $\mu$ in 17 $\mu$ in  10 % 6.6 % 3.9 %	Gage blocks, optical parallels
Surface Plate, Granite <sup>3</sup> –  Repeatability  Flatness	(12 in $\times$ 12 in) to (72 in $\times$ 144 in)  Up to (9 in $\times$ 12 in)	35 $\mu$ in  28 $\mu$ in	Repeat-o-meter  Electronic gage head and amplifier
	(12 in $\times$ 12 in) to (18 in $\times$ 24 in)	59 $\mu$ in	Planekator
	(24 in $\times$ 36 in) to (36 in $\times$ 48 in)	90 $\mu$ in	Autocollimator
	(36 in $\times$ 60 in) to (48 in $\times$ 60 in)	120 $\mu$ in	
	(48 in $\times$ 72 in) to (48 in $\times$ 96 in)	190 $\mu$ in	
	(72 in $\times$ 96 in) to (72 in $\times$ 144 in)	210 $\mu$ in	

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Thread Wires, Working 60°	(4 to 80) TPI (0.3 to 6.0) mm	18 µin 0.47 µm	Gage blocks, Supermicrometer™
Thread Wires, Master	(4 to 80) TPI (0.3 to 6.0) mm	12 µin 0.31 µm	Gage blocks, universal Supermicrometer™
Thread Plug Gages, 60° –			
Pitch Diameter	Up to 1 in (1 to 4) in	90 µin (90 + 4D) µin	Three wire method using Supermicrometer™
Major Diameter	Up to 1 in (1 to 4) in	55 µin (55 + 7D) µin	Gage blocks using Supermicrometer™

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Indirect Verification of Rockwell Hardness & Rockwell Superficial Hardness Testers <sup>3</sup>	<p>HRA: (20 to 65) HRA (70 to 78) HRA (80 to 84) HRA</p> <p>HRBW: (40 to 59) HRBW (60 to 79) HRBW (80 to 100) HRBW</p> <p>HRC: (20 to 30) HRC (35 to 55) HRC (60 to 65) HRC</p> <p>HREW: (70 to 79) HREW (84 to 90) HREW (93 to 100) HREW</p> <p>HR15N: (70 to 77) HR15N (78 to 88) HR15N (90 to 92) HR15N</p>	<p>0.46 HRA 0.36 HRA 0.31 HRA</p> <p>0.74 HRBW 0.75 HRBW 0.60 HRBW</p> <p>0.44 HRC 0.42 HRC 0.38 HRC</p> <p>0.59 HREW 0.66 HREW 0.61 HREW</p> <p>0.48 HR15N 0.62 HR15N 0.45 HR15N</p>	ASTM E18

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers <sup>3</sup> (cont)	HR30N:		ASTM E18
	(42 to 50) HR30N	0.75 HR30N	
	(55 to 73) HR30N	0.61 HR30N	
	(77 to 82) HR30N	0.60 HR30N	
	HR45N:		
	(20 to 31) HR45N	0.55 HR45N	
	(37 to 61) HR45N	0.67 HR45N	
	(66 to 72) HR45N	0.50 HR45N	
	HR15TW:		
	(74 to 80) HR15TW	0.72 HR15TW	
	(81 to 86) HR15TW	0.75 HR15TW	
	(87 to 93) HR15TW	0.58 HR15TW	
	HR30TW:		
	(43 to 56) HR30TW	0.55 HR30TW	
	(57 to 69) HR30TW	0.67 HR30TW	
	(70 to 83) HR30TW	0.50 HR30TW	
	HR45TW:		
	(13 to 32) HR45TW	0.70 HR45TW	
(33 to 52) HR45TW	0.63 HR45TW		
(53 to 73) HR45TW	0.64 HR45TW		

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

<sup>2</sup> 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.

<sup>3</sup> Field calibration service is available for this calibration and this laboratory. 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.

<sup>4</sup> In the statement of CMC,  $L$  is the numerical value of the nominal length of the device measured in inches and,  $D$  is the numerical value of the nominal diameter of the device measured in inches.

<sup>5</sup> In the statement of CMC, the value is defined as the percentage of reading, unless otherwise noted.

<sup>6</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.



## Accredited Laboratory

A2LA has accredited

**CAL-LABS**

*La Mirada, CA*

for technical competence in the field of

**Calibration**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCCL Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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 April 2017).



Presented 22<sup>nd</sup> day of July 2021

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1672.01  
Valid to June 30, 2023

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