



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994 & ANSI/NCSL Z540.3-2006

MITUTOYO AMERICA CORPORATION
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CALIBRATION

Valid To: *See details on footnote*

Certificate Number: 0750.01

In recognition of the successful completion of the A2LA evaluation process, process (including an assessment of the organization's compliance to A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations^{1, 15}:

I. Dimensional

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Adjustable Parallels	(0.375 to 3.00) in (9 to 75) mm	40 μ in 1.0 μ m	Mu-checker	Chicago
Angle Gages	(5 to 180) $^{\circ}$	2.2 arc min	Optical comparator	Chicago
Angle Gage Blocks	Up to 90 $^{\circ}$	0.56 arc sec	CMM	Chicago
Calipers ⁷	Up to 80 in Up to 2000 mm	(120 + 1.0L) μ in (3.1 + 1.0L) μ m (120 + 1.3L) μ in (3.1 + 1.3L) μ m	Gage blocks & caliper checker	Chicago LA
Caliper Gages (Inside / Outside)	Up to 7.2 in Up to 200 mm	(7.1 + 3.3L) μ in (0.2 + 3.3L) μ in	Gage blocks	Chicago LA

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Check Masters/Caliper Checkers/ Step Gages –	Up to 12 in Up to 300 mm	$(6.0 + 0.5L) \mu\text{in}$ $(0.15 + 0.5L) \mu\text{m}$	Gage blocks	Chicago Chicago Cincinnati LA
	Up to 40 in Up to 1000 mm	$(10 + 0.5L) \mu\text{in}$ $(0.25 + 0.50L) \mu\text{m}$	CMM	
	(> 40 to 60) in (> 1000 to 1500) mm	$(10 + 0.70L) \mu\text{in}$ $(0.25 + 0.70L) \mu\text{m}$	CMM	
	Up to 80 in Up to 2000 mm	$(70 + 2.2L) \mu\text{in}$ $(1.8 + 2.2L) \mu\text{m}$	CMM	
Circle Chart (Chart 009)	(0.002 to 26) mm	0.050 μm	Vision CMM	Chicago
Coating Thickness Gage (Digi-Derm & Lamina Checker)	(0.0005 to 0.060) in (0.013 to 1.5) mm	20 μin 0.5 μm	Master films	Chicago
Coordinate Measuring Machines (CMM) & Vision Instruments ³ –				
Length Accuracy	(0 to 1000) mm	$(0.11 + 0.13L) \mu\text{m}$	Gage blocks ⁹	Chicago
	(0 to 1000) mm	$(0.25 + 0.51L) \mu\text{m}$	Step gage ⁹	
	(0 to 5000) mm	0.71L μm	He-Ne laser ⁹	
	(0 to 350) mm (> 350 to 1000) mm	$(0.10 + 0.12L) \mu\text{m}$ $(0.06 + 0.25L) \mu\text{m}$	Linescale ¹⁰	
Probe Performance	(0 to 150) mm	$(0.060 + 0.67L) \mu\text{m}$	Gage blocks ¹⁰	
	(10 to 51) mm	0.026 μm	Sphere ¹¹	
	(2 to 4) mm	0.20 μm	Circle chart ¹⁰	
Scanning Performance	(24.9 to 25.5) mm	0.026 μm	Sphere ¹³	
Multiple Stylus	(10 to 51) mm	0.026 μm	Sphere ¹¹	
Rotary Axis Performance	(10 to 30) mm	0.026 μm	Sphere ¹²	
Squareness	(0 to 600) mm	$(0.076 + 0.70L) \mu\text{m}$	Square ¹⁰	
Video Probe	(0.02 to 4) mm	0.50 μm	Pixel chart	
Magnification Offset	0.5x to 30x	1.2 μm	Pixel chart	

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Cylindrical Squares				
Parallelism	(1 to 20.7) in (25 to 550) mm	0.25 μ in/in 0.25 μ m/m	Roundness tester reversal method	Chicago
Squareness	(0 to 20.7) in (0 to 550) mm	8 μ in 0.20 μ m	Roundness tester	
Roundness	(0 to 20.7) in (0 to 550) mm	4 μ in 0.10 μ m	Roundness tester	
Depth Gages (Caliper, Micrometer)	(0 to 40) in (0 to 1000) mm	(6 + 2.5L) μ in (0.15 + 2.5L) μ m	Gage blocks	Chicago LA
Dial & Test Indicators	(0 to 4) in (0 to 100) mm	(4.6 + 4.8L) μ in (0.12 + 4.8L) μ m	Indicator tester	Chicago
	(0 to 0.2) in (0 to 5) mm	20 μ in 0.55 μ m	Dial calibration tester	Chicago LA
	(> 0.2 to 2) in (> 5 to 50) mm	160 μ in 4.0 μ m		
Dial Indicator Tester	(0 to 0.2) in (0 to 5) mm	10 μ in 0.25 μ m	Gage blocks	Chicago LA
	(0 to 2.4) in (0 to 60) mm	30 μ in 0.8 μ m		
Digimatic Indicators ⁷	(0 to 2.4) in (0 to 60) mm	(6.5 + 2.0L) μ in (0.17 + 2.0L) μ m	Gage blocks	Chicago LA
Digital Protractor	Up to 90°	0.10°	Sine bar & gage blocks	Chicago
Films (Plastic)	(0 to 0.250) in (0 to 6) mm	20 μ in 0.5 μ m	Linear measuring machine	Chicago

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Gage Blocks				
Length	(0.004 to 0.09) in (0.1 to 0.5) mm	1.8 μ in 0.05 μ m	Gage blocks	Chicago
	(> 0.09 to 4) in (> 0.5 to 100) mm	(1.3 + 0.22L) μ in (0.033 + 0.22L) μ m		
	(> 4 to 20) in (> 100 to 500) mm	(0.7 + 0.95L) μ in (0.02 + 0.95L) μ m		
	(> 20 to 40) in (> 500 to 1000) mm	(10 + 0.5L) μ in (0.25 + 0.5L) μ m	CMM	
Parallelism (Variation in Length)	(0.004 to 4) in (0.5 to 100) mm	0.60 μ in 0.015 μ m	Gage blocks	
	(> 4 to 20) in (> 100 to 500) mm	3.0 μ in 0.08 μ m		
Central Length Difference ⁸	(0.05 to 4) in (0.5 to 100) mm	(1.0 + 0.2L) μ in (0.025 + 0.2L) μ m	Comparison between gage block pairs	
Gage Block Comparators ³	Up to 100 mm	1.0 μ in 0.025 μ m	Gage blocks	Chicago
Height Gages ⁷ (Including Heightmatic, QM-Height & Linear Height) –				
Length	Up to 24 in Up to 610 mm	(18 + 0.90L) μ in (0.46 + 0.90L) μ m	Step gage	Chicago LA
	Up to 40 in Up to 1000 mm	(36 + 1.2L) μ in (0.91 + 1.2L) μ m	Height master	Chicago
	Up to 40 in Up to 1000 mm	(36 + 1.5L) μ in (0.91 + 1.5L) μ m		LA
Straightness	Up to 24 in Up to 610 mm	60 μ in 1.5 μ m	Master square	Chicago LA
Perpendicularity	Up to 24 in Up to 610 mm	(30 + 1.6L) μ in (0.76 + 1.6L) μ m	Master square	

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Height Masters	Up to 40 in Up to 1000 mm	$(6.0 + 0.93L) \mu\text{in}$ $(0.15 + 0.93L) \mu\text{m}$	Master gage blocks	Chicago
	Up to 40 in Up to 1000 mm	$(3.0 + 2.2L) \mu\text{in}$ $(0.08 + 2.2L) \mu\text{m}$		LA
I-Checker (Indicator Tester)	Up to 4 in Up to 100 mm	$(2.2 + 1.0L) \mu\text{in}$ $(0.06 + 1.0L) \mu\text{m}$	Gage blocks	Chicago
Inside Diameter Measuring Instruments (Boremetrics, Holtest, & Bore Gages) ⁷	Up to 12 in Up to 300 mm	$(31 + 3.2D) \mu\text{in}$ $(0.8 + 3.2D) \mu\text{m}$	Ring gages	Chicago
Laser Scan Micrometer	Up to 4 in Up to 100 mm	$(13 + 3.2L) \mu\text{in}$ $(0.33 + 3.2L) \mu\text{m}$	Pin gages	Chicago
	Up to 4 in Up to 100 mm	$(13 + 3.3L) \mu\text{in}$ $(0.33 + 3.3L) \mu\text{m}$		LA
Length Standards/ Micrometer Standards				
Flat End	Up to 60 in Up to 1500 mm	$(6.0 + 1.6L) \mu\text{in}$ $(0.15 + 1.6L) \mu\text{m}$	Gage blocks	Chicago
Spherical End	Up to 60 in Up to 1500 mm	$(30 + 1.6L) \mu\text{in}$ $(0.76 + 1.6L) \mu\text{m}$		
Line Scales	Up to 16 in Up to 410 mm	$(10 + 0.6L) \mu\text{in}$ $(0.25 + 0.6L) \mu\text{m}$	Vision CMM	Chicago
	(> 16 to 24) in (> 410 to 610) mm	$(10 + 0.9L) \mu\text{in}$ $(0.25 + 0.9L) \mu\text{m}$		
	Up to 40 in Up to 1000 mm	$(10 + 0.5L) \mu\text{in}$ $(0.25 + 0.5L) \mu\text{m}$	CMM	
Linear Gage with Counter ⁷	Up to 4.00 in Up to 100 mm	$(7.1 + 0.8L) \mu\text{in}$ $(0.18 + 0.8L) \mu\text{m}$	Gage blocks	Chicago
		$(7.1 + 1.3L) \mu\text{in}$ $(0.18 + 1.3L) \mu\text{m}$		LA

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Litematic	Up to 2 in Up to 50 mm	$(2.0 + 0.5L) \mu\text{in}$ $(0.05 + 0.5L) \mu\text{m}$	Gage blocks	Chicago LA
Micrometer Heads	Up to 2 in Up to 51 mm	$3 \mu\text{in}$ $0.08 \mu\text{m}$	Linear measuring machine	Chicago
Micrometers ⁷ – Outside/Inside/Tubular/ Indicating & Snap/Groove	Up to 1 in Up to 25 mm (1 to 80) in (25 to 2000) mm	$4.0 \mu\text{in}$ $0.10 \mu\text{m}$ $(6.0 + 2.0L) \mu\text{in}$ $(0.15 + 2.0L) \mu\text{m}$	Gage blocks	Chicago LA
Microscope – Linearity (X & Y) Magnification Angular	Up to (16 x 8) in Up to (400 x 200) mm 1x to 100x Up to 360°	$(52 + 1.2L) \mu\text{in}$ $(1.3 + 1.2L) \mu\text{m}$ $80 \mu\text{in}$ or $2.0 \mu\text{m}$ 1.5 arc min	Stage micrometer scale & angle reticle	Chicago
Mu-Checker/Amplifier	Up to 0.05 in Up to 1.5 mm	$6.0 \mu\text{in}$ $0.15 \mu\text{m}$	Gage blocks	Chicago LA
Optical Flats/Parallels Flatness Parallelism	(0.5 to 12) in (4 to 300) mm (0.5 to 16) in (4 to 400) mm (0.5 to 2) in (4 to 50) mm	$2.0 \mu\text{in}$ $0.050 \mu\text{m}$ $(1.1 + 0.3D) \mu\text{in}$ $(0.28 + 0.3D) \mu\text{m}$ $5.0 \mu\text{in}$ $0.13 \mu\text{m}$	Master optical flat Roundness tester Gage blocks	Chicago
Overlay Charts – Length Angle	Up to 16 in Up to 400 mm Up to 360°	$(22 + 5.0D) \mu\text{in}$ $(0.55 + 5.0D) \mu\text{m}$ 15 arc sec	Vision CMM	Chicago
Parallel Bars	(1 to 6) in (25 to 150) mm	$40 \mu\text{in}$ $1.0 \mu\text{m}$	Mu-checker	Chicago

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Pins/Plugs/Spheres/ Balls/Hemispheres				
Diameter	Up to 2 in Up to 50 mm	$(5.0 + 0.7D) \mu\text{in}$ $(0.13 + 0.7D) \mu\text{m}$	Linear measuring machine & master plugs	Chicago
	(> 2 to 6) in (> 50 to 150) mm	$(5.0 + 0.9D) \mu\text{in}$ $(0.13 + 0.9D) \mu\text{m}$		
Roundness	Up to 16 in Up to 400 mm	$(0.80 + 0.60H) \mu\text{in}$ $(0.02 + 0.60H) \mu\text{m}$	Roundness tester	
	(0.5 to 2) in (4 to 50) mm	0.20 μin 0.0050 μm	Reversal method on roundness tester	
Pitch Micrometer Standard	(1 to 6) in (1 to 150) mm	$(67 + 8.0L) \mu\text{in}$ $(1.7 + 8.0L) \mu\text{m}$	Linear measuring machine	Chicago
Pixel Calibration Charts	Up to 0.16 in Up to 4 mm	$(10 + 0.6L) \mu\text{in}$ $(0.25 + 0.6L) \mu\text{m}$	Vision CMM	Chicago
Precision Levels	(5 to 16) in (100 to 406) mm	150 μin 4 μm	Sine bar & gage blocks	Chicago
Precision Sine Plates –	Up to 10 in Up to 250 mm	5.5 arc sec	Gage & angle blocks	Chicago
Precision Vise	Up to 6 in Up to 150 mm	40 μin 1.0 μm	Linear height & Mu-checker	Chicago
Protractor	Up to 180°	1.5 arc min	Optical comparator	Chicago
Projectors ^{3, 7} –				
Squareness	Up to 150 mm	$(0.63 + 1.7L) \mu\text{m}$	Steel square	Chicago
Length Accuracy	Up to 300 mm	$(1.3 + 0.3L) \mu\text{m}$	Glass scale	
Magnification	0x to 50x	0.01 %	Glass scales	

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Radius Gages	(0.01 to 2) in (0.25 to 50) mm	0.000 50 in 0.013 mm	Optical comparator	Chicago
Reticles	Up to 1 in Up to 25 mm	60 μ in 1.5 μ m	Vision CMM	Chicago
Ring Gages	(0.6 to 4) in (15 to 100) mm (0.04 to 21) in (1 to 535) mm	(6.0 + 1.3D) μ in (0.15 + 1.3D) μ m (9.4 + 0.7D) μ in (0.24 + 0.7D) μ m	Linear measuring machine & master ring gages CMM	Chicago
Riser Blocks	Up to 24 in Up to 600 mm	(4.3 + 1.0H) μ in (0.11 + 1.0H) μ m (2.5 + 2.3H) μ in (0.06 + 2.3H) μ m	Gage blocks	Chicago LA
Screw Pitch Gages (Leaf Type)	(4.0 to 84.0) TPI (0.25 to 7.0) mm	250 μ in 7 μ m	Optical comparator	Chicago
Screw Thread Anvils	60° & 55°	0.04°	Optical comparator	Chicago
Sine Bars	Up to 40 in Up to 1000 mm	(10 + 0.5L) μ in (0.25 + 0.5L) μ m	CMM	Chicago
Squares	Up to 24 in Up to 610 mm Up to 40 in Up to 1000 mm	(12 + 5.1L) μ in (0.3 + 5.1L) μ m (3.0 + 0.70L) μ in (0.076 + 0.70L) μ m	Master square CMM using reversal technique	Chicago

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Specialty Gages – 1D Length	Up to 100 mm	$(0.058 + 0.81L) \mu\text{m}$	Contact methods	Chicago
	(> 100 to 500) mm	$(0.061 + 0.9L) \mu\text{m}$	Contact methods	Chicago
	(> 500 to 1000) mm	$(0.25 + 0.50L) \mu\text{m}$	Contact methods	Chicago
	Up to 400 mm	$(0.25 + 0.60L) \mu\text{m}$	Non-contact methods	Chicago
	Up to 30 mm	$(0.7 + 0.5L) \mu\text{m}$	Micrometer	Cincinnati LA
	Up to 600 mm	$(1.8 + 3.9L) \mu\text{m}$	Non-contact methods	Cincinnati LA
	Up to 2000 mm	$(1.8 + 2.2L) \mu\text{m}$	Contact methods	Chicago Cincinnati LA
2D Length	(400 x 400) mm	$(0.5 + 2.2L) \mu\text{m}$	Non-contact methods	Chicago
	(600 x 600) mm	$(1.8 + 6L) \mu\text{m}$	Non-contact methods	Cincinnati LA
	(900 x 1000) mm	$(0.43 + 1.3L) \mu\text{m}$	Contact methods	Chicago
	(1200 x 2000) mm	$(2.8 + 3.5L) \mu\text{m}$	Contact methods	Chicago Cincinnati LA
3D Length	(1200 x 2000 x 1000) mm	$(2.8 + 3.5L) \mu\text{m}$	Contact methods	Chicago Cincinnati LA
Form	(900 x 1000 x 600) mm	$(0.43 + 1.3L) \mu\text{m}$	Contact methods	Chicago
	Up to 50 mm	0.005 μm	Roundness tester	Chicago
	(> 50 to 550) mm	0.025 μm	Roundness tester	Chicago
	Up to 500 mm	$(0.02 + 0.47L) \mu\text{m}$	Contact methods	Cincinnati LA
	Up to 1000 mm	0.050 μm	CMM	Chicago
	Up to 2000 mm	$(2.8 + 3.5L) \mu\text{m}$	Contact methods	Chicago Cincinnati LA

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Surface Finish	Ra (0 to 1.0) μm	0.018 μm	Surface roughness tester	Chicago
	Ra (> 1.0 to 12.7) μm	1.2 % of Nominal value		
	Ra (0 to 1.0) μm	0.04 μm	Surface roughness tester	Cincinnati LA
	Ra (> 1.0 to 12.7) μm	1.7 % of Nominal value		
Step Height Specimen	(0.01 to 0.120) in (0.25 to 3) mm	4.5 μin 0.12 μm	Gage block comparator	Chicago
Straightedge	Up to 21.7 in Up to 550 mm	8.0 μin 0.20 μm	Roundness tester	Chicago
	Up to 21.7 in Up to 550 mm	1.0 μin 0.025 μm	Reversal method on roundness tester	
	Up to 40 in Up to 1000 mm	2.0 μin 0.050 μm	Reversal method on CMM	
Surface Finish & Form Measuring Instruments ^{3, 7} —				
Detector Accuracy	(-30 to 30) mm	(0.052 + 0.6L) μm	Gage blocks	Chicago
Straightness	Up to 550 mm (550 to 1000) mm	0.025 μm 0.10 μm	Straightedge	
Radial Motion	Up to 360°	0.0050 μm	Precision sphere	
Axial Motion	Up to 360°	0.0010 μm	Precision sphere	
Parallelism	(10 to 550) mm	0.13 $\mu\text{m}/\text{m}$	Cylindrical square	
Squareness	(10 to 400) mm	0.28 $\mu\text{m}/\text{m}$	Square reversal	
Length	Up to 200 mm	(0.5 + 0.7L) μm	Pitch gage	
	Up to 550 mm	(0.71L) μm	He-Ne laser	Chicago LA
Surface Finish	Up to 10 μm Up to 400 μin	0.02 μm 0.8 μin	Surface finish specimen	

Parameter/Equipment	Range ⁴	CMC ^{2, 5} ($\pm$)	Comments	Location ¹⁴
Surface Finish Specimen	Ra (0 to 40) μ in Ra (0 to 1.0) μ m Ra (> 40 to 500) μ in Ra (> 1.0 to 12.7) μ m Ra (0 to 40) μ in Ra (0 to 1.0) μ m Ra (> 40 to 500) μ in Ra (> 1.0 to 12.7) μ m	0.7 μ in 0.018 μ m 1.2 % of nominal value 1.4 μ in 0.04 μ m 1.7 % of Nominal value	Surface finish tester	Chicago Cincinnati LA
Tap & Drill Gage	(0.001 to 0.500) in (0.025 to 12.70) mm	250 μ in 6.4 μ m	Optical comparator	Chicago
Thickness Gages (Feeler Type)	(0.001 to 0.050) in (0.025 to 1.27) mm	35 μ in 1.0 μ m	Linear measuring machine	Chicago
Thickness Measuring Gages (Digital & Dial)	Up to 2 in Up to 50 mm	(7.2 + 0.6L) μ in (0.2 + 0.6L) μ m	Gage blocks	Chicago LA
Thread Measuring Wires	(1 to 120) TPI (0.2 to 10.0 mm) Pitch	5.0 μ in 0.15 μ m	Linear measuring machine	Chicago
Ultrasonic Thickness Gage (Mu Gage)	Up to 2 in Up to 50 mm	(100 + 16L) μ in (2.5 + 16L) μ m	Gage blocks	Chicago
V-Anvil Micrometers	Up to 3.4 in Up to 87 mm	(64 + 4.0L) μ in (1.6 + 4.0L) μ m	Pin gages	Chicago LA
V-Blocks	Up to 4 in Up to 102 mm	65 μ in 1.7 μ m	Mu checker with lever head probe	Chicago
Wire Gages	(0.005 to 4) in	250 μ in	Optical comparator	Chicago
1-2-3 Blocks – Parallelism Squareness	(1 x 2 x 3) in	35 μ in or 0.90 μ m 40 μ in or 1.0 μ m	Mu-checker with lever head probe	Chicago

II. Dimensional Testing¹

Parameter/Equipment	Range ⁴	Comments	Location ¹⁴
Geometric Measurements ⁶ –			
1D	Up to 1000 mm	Contact methods	Chicago
	Up to 2000 mm	Contact methods	Chicago Cincinnati LA
	Up to 400 mm	Non-contact methods	Chicago
	Up to 600 mm	Non-contact methods	Cincinnati LA
2D	Up to (900 x 1000) mm	Contact methods	Chicago
	Up to (400 x 400) mm	Non-contact methods	Chicago
	Up to (600 x 600) mm	Non-contact methods	Cincinnati LA
	Up to (1200 x 2000) mm	Contact methods	Chicago Cincinnati LA
3D	Up to (900 x 1000 x 600) mm	Contact methods	Chicago
	Up to (1200 x 2000 x 1000) mm	Contact methods	Chicago Cincinnati LA
Form	Up to 1000 mm	Contact methods	Chicago
	Up to 400 mm	Non-contact methods	Chicago
	Up to 500 mm	Contact methods	Cincinnati LA
	Up to 2000 mm	Contact methods	Chicago Cincinnati LA
Surface Finish	Ra Up to 12.7 μ m	Surface roughness tester	Chicago Cincinnati LA

III. Mechanical

Parameter/Equipment	Range ⁴	CMC ² ($\pm$)	Comments	Location ¹⁴
Hardness Tester (Leeb Scale)	(500 to 900) HLD	16 HLD	ASTM A956	Chicago
Hardness Test Blocks (Leeb Scale)	(500 to 900) HLD	20 HLD	ASTM A956	Chicago
Durometer Tester Type A & D Indenter Length Indenter Angle Indenter Radius Indenter Tip Diameter	(0 to 100) Duro	0.60 Duro 200 μ in 3.5 arc min 400 μ in 400 μ in	ASTM D2240 Gage blocks Vision CMM or optical comparator	Chicago LA
Durometer Test Blocks Type A & D	(0 to 100) Duro	1.0 Duro	ASTM D2240	Chicago
Direct Verification of Rockwell Hardness Testers ³ — Test Force Depth Measuring System Hysteresis Testing Cycle	 (3 to 150) kgf (0 to 0.2) mm 100 HR & 130 HR Up to 30 s	 0.38 % of range 0.47 μ m 0.12 HR 0.10 s	ASTM E18 Load cell Linear gage Stopwatch	Chicago
Direct Verification of Vickers & Knoop Hardness Testers ³ — Test Force Indentation Measuring System Testing Cycle	 (0.001 to 120) kgf (0 to 0.1) mm Up to 30 s	 0.38 % of range 0.40 μ m 0.10 s	ASTM E92 Load cell Line scale Stopwatch	Chicago

Parameter/Equipment	Range ⁴	CMC ² (±)	Comments	Location ¹⁴
Indirect Verification of Rockwell & Rockwell Superficial Hardness Testers ³	HRA: High Medium Low HRBW: High Medium Low HRC: High Medium Low HRD: High Medium Low HR30N: High Medium Low HR30TW: High Medium Low	0.20 HRA 0.22 HRA 0.24 HRA 0.43 HRBW 0.54 HRBW 0.66 HRBW 0.32 HRC 0.34 HRC 0.35 HRC 0.40 HRD 0.42 HRD 0.51 HRD 0.32 HR30N 0.36 HR30N 0.41 HR30N 0.34 HR30TW 0.42 HR30TW 0.50 HR30TW	ASTM E18	Chicago
Indirect Verification of Vickers & Knoop Hardness Testers ³				
Macro V	Low Medium High	0.12 HV 1.2 HV 2.4 HV	ASTM E92	Chicago
Micro V	Low Medium High	0.21 HV 1.8 HV 3.6 HV		
Micro K	Low Medium High	0.5 HK 2.1 HK 2.6 HK		

¹ This laboratory offers commercial and field calibration and dimensional testing services.

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. 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 Metric equivalencies for these ranges and associated CMCs are also available.

⁵ In the statement of CMC, L is the length in inches/meters; D is the diameter in inches/meters; H is the height in inches/meters and R is the resolution in $\mu\text{in}/\mu\text{m}$.

⁶ This test is not equivalent to that of a calibration.

⁷ Repeatability of the Unit Under Test has not been utilized in the calculation of the CMC value for this measurement parameter.

⁸ The CMC claim is smaller than that of the expanded uncertainty claim for NIST as listed in the BIPM Key Comparison Database. A2LA has evaluated the laboratory's CMC claim and has verified this information to be correct and appropriate.

⁹ Calibration method in accordance to ISO 10360-2:2001 or ISO 10360-2:2009.

¹⁰ Calibration method in accordance to ISO 10360-7.

¹¹ Calibration method in accordance to ISO 10360-5:2020 and ISO 10360-5:2010.

¹² Calibration method in accordance to ISO 10360-3.

¹³ Calibration method in accordance to ISO 10360-4:2000 and ISO 10360-5:2020.

¹⁴ The locations of the laboratories that can perform the calibrations are given by a letter code with valid to dates given in the table below:

Location	Code	Valid Dates
965 Corporate Blvd, Aurora, IL 60502	Chicago	05/31/2026
16 925 E. Gale Ave, City of Industry, CA 91745	LA	05/31/2026
8876 Beckett Road, West Chester, OH 45069	Cincinnati	10/31/2027

¹⁵ This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

MITUTOYO AMERICA CORPORATION

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/NCSL Z540-1-1994 and the requirements of ANSI/NCSL Z540.3-2006 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 this 31st of October, 2025.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 750.01
Valid to: See Scope of Accreditation

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