



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

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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} (±) | Comments | Location ¹⁴ |
|-------------------------------------|------------------------------------|--------------------------------------|----------------------------------|------------------------|
| Adjustable Parallels | (0.375 to 3.00) in (9 to 75) mm | 40 µin 1.0 µm | Mu-checker | Chicago |
| Angle Gages | (5 to 180)° | 2.2 arc min | Optical comparator | Chicago |
| Angle Gage Blocks | Up to 90° | 0.56 arc sec | CMM | Chicago |
| Calipers ⁷ | Up to 80 in Up to 2000 mm | (120 + 1.0L) µin (3.1 + 1.0L) µm | Gage blocks & caliper checker | Chicago |
| | | (120 + 1.3L) µin (3.1 + 1.3L) µm | | LA |
| Caliper Gages (Inside / Outside) | Up to 7.2 in Up to 200 mm | (7.1 + 3.3L) µin (0.2 + 3.3L) µin | 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 | | |
| | (0 to 150) mm | $(0.060 + 0.67L) \mu\text{m}$ | Gage blocks ¹⁰ | | |
| | Probe Performance | (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 | 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 |
| | | | | |
| 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 | Chicago | |
| | (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 | |
| Surface Finish | Up to 10 μm Up to 400 μin | 0.02 μm 0.8 μin | Surface finish specimen | Chicago LA |

| Parameter/Equipment | Range ⁴ | CMC ^{2,5} (±) | Comments | Location ¹⁴ |
|---|---|---------------------------------------|----------------------------------|------------------------|
| Surface Finish Specimen | Ra (0 to 40) μin Ra (0 to 1.0) μm | 0.7 μin 0.018 μm | Surface finish tester | Chicago |
| | Ra (> 40 to 500) μin Ra (> 1.0 to 12.7) μm | 1.2 % of nominal value | | |
| | Ra (0 to 40) μin Ra (0 to 1.0) μm | 1.4 μin 0.04 μm | | Cincinnati LA |
| | Ra (> 40 to 500) μin Ra (> 1.0 to 12.7) μm | 1.7 % of Nominal value | | |
| Tap & Drill Gage | (0.001 to 0.500) in (0.025 to 12.70) mm | 250 μin 6.4 μm | Optical comparator | Chicago |
| Thickness Gages (Feeler Type) | (0.001 to 0.050) in (0.025 to 1.27) mm | 35 μin 1.0 μm | Linear measuring machine | Chicago |
| Thickness Measuring Gages (Digital & Dial) | Up to 2 in Up to 50 mm | (7.2 + 0.6L) μin (0.2 + 0.6L) μm | Gage blocks | Chicago LA |
| Thread Measuring Wires | (1 to 120) TPI (0.2 to 10.0 mm) Pitch | 5.0 μin 0.15 μm | Linear measuring machine | Chicago |
| Ultrasonic Thickness Gage (Mu Gage) | Up to 2 in Up to 50 mm | (100 + 16L) μin (2.5 + 16L) μm | Gage blocks | Chicago |
| V-Anvil Micrometers | Up to 3.4 in Up to 87 mm | (64 + 4.0L) μin (1.6 + 4.0L) μm | Pin gages | Chicago LA |
| V-Blocks | Up to 4 in Up to 102 mm | 65 μin 1.7 μm | Mu checker with lever head probe | Chicago |
| Wire Gages | (0.005 to 4) in | 250 μin | Optical comparator | Chicago |
| 1-2-3 Blocks – Parallelism Squareness | (1 x 2 x 3) in | 35 μin or 0.90 μm 40 μin or 1.0 μm | 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 |
| | 2D | Up to 600 mm | Non-contact methods | Cincinnati LA |
| | | 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 |
| | 3D | Up to (1200 x 2000) mm | Contact methods | Chicago Cincinnati LA |
| | | 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 (±) | 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 μin 3.5 arc min 400 μin 400 μin | 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 μm 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 μm 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 Micro V Micro K | Low Medium High Low Medium High Low Medium High | 0.12 HV 1.2 HV 2.4 HV 0.21 HV 1.8 HV 3.6 HV 0.5 HK 2.1 HK 2.6 HK | ASTM E92 | Chicago |

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 | 06/30/2026 |
| 16 925 E. Gale Ave, City of Industry, CA 91745 | LA | 06/30/2026 |
| 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 Trace McInturff, written in a cursive style.

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.