SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

QUALITY TESTING CALIBRATION (QTC)
1042 Elizabeth Street, Suite 5
Nicholasville, KY 40356
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CALIBRATION

Valid To: December 31, 2025 Certificate Number: 4699.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1, 6]:

I. Dimensional

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Adjustable Thread Rings[3]	(0.01 to 4) in	300 µin	Trimos THV ULM, Thread setting plug
Angle Blocks	(1 to 90)°	0.037°	Vision system
Angle Gages	(1 to 180)°	0.15°	Vision system, angle blocks, CMM, grade AA surface plate
Bore Gages[3]	(0.25 to 6) in	(76 + 13D) µin	Class X & XX ring gages
Calipers[3]	(1 to 8) in	290 µin	Grade 0 gage blocks, grade X ring gage
Depth Micrometers[3]	(0.1 to 6) in	(390 + 0.11L) µin	Depth micro checker, grade 0 gage blocks
Dial Thickness Gages[3]	(0.005 to 0.035) in (0.05 to 2.0) in	(89 + 1100L) µin (88 + 6.3L) µin	Feeler gage, grade 0 gage blocks

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Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Drop Indicators[3]	(0.001 to 1) in	59 µin	Indi-check
Film Thickness Standard/Foils	(1 to 266) mils	(0.029 + 0.57*L*)mils	Trimos THV ULM
Gage Blocks	(0.02 to 0.1) in (>0.1 to 4.0) in	5.7 µin (5.1 + 2.0) µin	Labmaster gage block comparator, grade 00 master blocks
Height Gages[3]	(1 to 24) in	(95 + 7.4*L*) µin	Starrett height master, grade AA surface plate
Height Masters	(0.02 to 24) in	(40 + 4.1*L*) µin	Grade 0, 00 gage blocks, Mahr inductive probe, grade AA surface plate
Length Bars, Micrometer Standards	(1 to 12) in (>12 to 24) in	(25 + 3.7*L*) µin (110 + 3.9*L*) µin	Grade 0 gage blocks, Mahr inductive probe, grade AA surface plate, height master
Micrometers[3]	(0.21 to 4) in (>4 to 12) in	(55 + 9.2*L*) µin (84 + 14*L*) µin	Grade 0 gage blocks
Optical Comparators[3] –			
Linearity, X Axis	(0.01 to 12) in	(230 + 33*L*) µin	Gage-line glass scale
Linearity, Y Axis	(0.01 to 6) in	(230 + 33*L*) µin	
Squareness	(0.01 to 6) in	(230 + 33*L*) µin	
Angularity	(0 to 180)°	0.021°	
Magnification	10 X, 20 X, 31.25 X, 50 X, 62.5 X, 100 X	0.04 % of reading	
Pin Gages – Class Z & ZZ	(0.01 to 1.3) in	(41 + 10*D*) µin	Laser micrometer

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Plain Ring Gages	(0.4 to 4) in	(27 + 8.7*D*) µin	Trimos THV ULM, class X, XX Master rings
Plug Gages	(0.01 to 4) in	(22 + 6.1*D*) µin	Trimos THV ULM
Radius Gages	(0.01 to 2) in	390 µin	Keyence vision system
Sine Bars	5 in	360 µin	Mahr inductive probe, Grade AA surface plate, Vision system
Snap Gages[3] –			
Adjustable Anvil	(0.25 to 8) in	(18 + 17*L*) µin	Grade 0 gage blocks, Trimos THV ULM, Indi-Check, class X, XX ring gages
Fixed Anvil	(0.4 to 4) in	(24 + 18*L*) µin	
Indicating	(0.25 to 8) in	(50 + 18*L*) µin	
Steel Rulers[3]	(1 to 72) in	0.006 in	Length bars, gage blocks
Surface Plates[3] –			
Flatness	(12 to 102) in diagonal	(58 + 3.1*DL*) µin	Mahr electronic levels
Repeat Measurement	(0.000 01 to 0.001) in	64 µin	Mahr digital indicator, repeat-o-meter
Test Indicators[3]	(0.001 to 0.06) in	69 µin	Indi-check
Thickness Meters, Coating Thickness, Wall Thickness[3]	(1 to 266) mils	(0.09 + 8*L*) mils	Coating thickness standards, thickness shims/foils
Thread Wires[3]	(0.01 to 0.1) in	21 µin	Trimos THV ULM, force gage

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Threaded Plug Gages –			
Pitch Diameter	(10 to 40) TPI	87 µin	Trimos THV ULM, thread wires, load cell
Major Diameter	(0.01 to 2) in	60 µin	
Vision Systems[3] –			
Linearity, X-Y Axis	(0.01 to 6) in	150 µin	Gage-Line glass scale, Grade 0 gage blocks
Squareness	(0.01 to 6) in	(230 + 33*L*) µin	

II. Dimensional Testing[5]

Parameter/Equipment	Range	CMC[2, 7] (±)	Comments
Dimensional Inspection[3, 5]			
3D Measurement	Up to 2400 mm	63 µm	CMM using ASME B89 4.10360.2-2008, ANSI Y14.5-2009

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Simulation of Thermocouple Indicators[3] –			
Type K	(-200 to 0) °C (0 to 1000) °C (1000 to 1372) °C	0.93 °C 0.59 °C 0.82 °C	Fluke 726
Type J	(-210 to 0) °C (0 to 800) °C (800 to 1200) °C	0.71 °C 0.48 °C 0.59 °C	
Type T	(-250 to 0) °C (0 to 400) °C	0.93 °C 0.48 °C	

IV. Mechanical

Parameter/Equipment	Range	CMC[2, 4, 7] (±)	Comments
Force – Tension & Compression: Measure[3]	(1 to 1000) lbf (>1000 to 25 000) lbf	(0.005 + 0.0012*Wt*) lbf (1.6 + 0.0013*Wt*) lbf	Class 5 weights, load cell w/ DRO, ASTM E4
Indirect Verification of Rockwell Hardness Testers[3]	HRA: Low Medium High HRBW: Low Medium High HRC: Low Medium High 15N: Low Medium High 30N: Low Medium High	 0.57 HRA 0.55 HRA 0.52 HRA 0.88 HRBW 1.1 HRBW 0.82 HRBW 0.56 HRC 0.61 HRC 0.44 HRC 0.56 HR15N 0.60 HR15N 0.63 HR15N 0.74 HR30N 0.70 HR30N 0.55 HR30N	ASTM E18 indirect verification method, hardness test blocks
Knoop & Vickers Hardness Testers[3]	505HV1.0 500HK0.5	12 HVK 17 HK	Indirect Verification per ASTM E384 / E92 using Knoop & Vickers Test Blocks
Mass – Class 5	(1 to 100) g (>100 to 1000) g (>1000 to 5000) g (>5000 to 30 000) g	(0.11 + 0.0020*Wt*) mg (1.4 + 0.0026*Wt*) mg (6.1 + 0.0058*Wt*) mg (160 + 0.0087*Wt*) mg	Class 1, 2, 3, weights, precision analytical scale

Parameter/Equipment	Range	CMC[2, 4, 7] (±)	Comments
Pressure – Measure[3]	(5 to 300) psi (>3000 to 10 000) psi -30 to 0 in/hg	0.25 psi 5.4 psi 0.18 in/hg	Pressure module, Fluke 726, Additel
Scales & Balances[3]	(0.01 to 100) g (>100 to 1000) g (>1000 to 20 000) g (0.5 to 1000) lb	(0.08 + 0.0022*Wt*) mg (1.6 + 0.0018*Wt*) mg (160 + 0.0058*Wt*) mg 0.013 % of reading	Class 1, 2, 3, & 5 weights
Torque Analyzers	(5 to 50) lbf·in (25 to 250) lbf·in (25 to 250) lbf·ft (100 to 600) lbf·ft	0.23 % of reading 0.28 % of reading 0.28 % of reading 0.17 % of reading	Class 5 weights, 4" & 24" Torque arm
Torque Wrenches[3]	(1 to 250) lbf·ft (>250 to 600) lbf·ft	1.4 % of reading 0.65 % of reading	Torque analyzer

V. Thermodynamics

Parameter/Equipment	Range	CMC[2, 4, 7] (±)	Comments
Non-Contact (IR) Thermometry – Measuring Equipment[3]	(20 to 500) °C	(1.4 + 0.012*T*) °C	Infrared calibrator, RTD with readout, TC with Fluke 726
Relative Humidity – Measuring Equipment	33 % RH 75 % RH	2.8 % RH	Vaisala HMP75, Saturated salt
Temperature – Measuring Equipment	(-20 to 90) °C (50 to 660) °C	0.084 °C 0.078 °C	PRT probe, Fluke 8846A readout, temperature bath, dry well
Uniformity of Ovens, Freezers, Furnaces, & Environmental Chambers[3]	(0 to 1200) °C	(1.9 + 0.0043t) °C	Data logger TC array AMS2750E

VI. Time & Frequency

Parameter/Equipment	Range	CMC[2] (±)	Comments
Timer/Stopwatch	1 s to 1 hr	1 s/hr.	Reference stopwatch

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[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. 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, *D* represents diameter in inches or millimeters, *L* represents the length in inches or millimeters, *DL* represents the diagonal length in inches or millimeters, *R* represents resolution and *Wt* represents weight in pounds or grams. *T* represents temperature in °F or °C.

[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.

[6] This scope meets A2LA's *P112 Flexible Scope Policy*.

[7] The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

Accredited Laboratory

A2LA has accredited

QUALITY TESTING CALIBRATION (QTC)

Nicholasville, KY

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 *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 10th day of January 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4699.01
Valid to December 31, 2025

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