The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

LABORATORY TESTING, INC.

Hatfield, PA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009*).

Presented this 16th day of June 2009.

President & CEO
For the Accreditation Council
Certificate Number 117.04
Valid to March 31, 2011

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

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

LABORATORY TESTING, INC.
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Hatfield, PA 19440
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CALIBRATION

Valid To: March 31, 2011 Certificate Number: 117.04

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

Dimensional

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Gage Blocks	Up to 1 in (>1 to 4) in (5 to 20) in	3.5 µin (2.5 + 1*L*) µin (7.7 + 0.4*L*) µin	Mechanical comparison with reference blocks
Length Standards	(1 to 20) in (>20 to 40) in >40 to 60 in	(33 + 2.2*L*) µin (48 + 2.3*L*) µin (64 + 1.7*L*) µin	UMM
Calipers[3]	(0 to 24) in	(13 + 7*L* + 0.6*R*) µin	Gage blocks
Outside Micrometers[3] –	(0 to 1) in (>1 to 6) in (>6 to 12) in (>12 to 24) in	60 µin (51 + 9.4*L*) µin (95 + 6*L*) µin (12 + 13*L*) µin	Gage blocks
Pitch Micrometers Disc Micrometers Interchangeable Anvil	(0 to 4) in (0 to 1) in (0 to 6) in	590 µin 150 µin 710 µin	Optical comparator
Inside Micrometers	(0 to 40) in	160 µin	UMM

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Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Height Gages	(1 to 48) in	(450 + 2.7*L* + 0.6*R*) µin	Gage blocks surface plate
Indicators – Dial/Digital	Up to 2 in	(28 + 0.6*R*) µin	Indicator calibrator
Optical Comparators[3] –			Accurite reticle and inspection scale
Linearity	(0 to 12) in	(650 + 0.6*R*) µin	
Magnification	(10x, 20x, 31.25x, 50x, 62.5x)	(750 + 0.6*R*) µin	
Angularity	(0 to 360)°	0º, 1', 17"	
Pin Gages	Up to 1 in	23 µin	UMM, Pratt & Whitney Supermicrometer®
Plugs	Up to 3.0 in	11 µin	Federal comparator
Radius Gages	Up to 1 in	150 µin	Video measuring machine
Threaded Plugs –			
Major Diameter	Up to 3.5 in	37 µin	UMM and Pratt & Whitney
	(3.5 to 6.5) in	55 µin	
Pitch Diameter	Up to 1.5 in	92 µin	Supermicrometer®
	(>1.5 to 3.5) in	130 µin	
	(>3.5 to 6.5) in	140 µin	
Thread Wires (1-Wire)	Up to 0.26 in	24 µin	UMM and Pratt & Whitney, Supermicrometer®
Plain Rings	Up to 3.0 in	13 µin	Comparator

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Adjustable Thread Rings			
Minor Diameter	Up to 0.425 in (>0.425 to 2.8) in (>2.8 to 6.6) in	81 µin 130 µin 140 µin	Bore gage, video measuring machine
Pitch Diameter	Up to 1.5 in (>1.5 to 3.5) in (>3.5 to 6.5) in	150 µin 180 µin 190 µin	Set plug
Tapered Thread Rings			
Standoff	(0 to 6) in	0.002 in	Gage blocks, master plug
L1 Length	(0 to 6) in	0.0001 in	
Tapered Thread Plugs			
Pitch Diameter	(0 to 6) in	0.00013 in	Gage blocks, Supermicrometer®, thread wires
L1 Length	(0 to 6) in	0.0001 in	
Rules	Up to 18 in (>18 to 78) in	170 µin (3100 + 0.7*L*) µin	Gage blocks, vision system
Surface Plates[3]	16 to 195 in diagonal	(14 + 0.2*L*) µin	Repeat-O-Meter Electronic levels
Pratt & Whitney Supermicrometer® / Bench Micrometers[3]	(0 to 2) in	20 µin	Gage blocks
CMM[3] –			
Repeatability Linearity Bi-Directional Linearity Volumetric	Up to 1 in Up to 36 in 1” (6 to 18) in cube (18 to 40) in cube	51 µin (59 + 10*L*) µin 25 µin (0 + 23*L*) µin (1.4 + 23*L*) µin	Sphere Step gage Gage blocks Ball bar

II. Mechanical

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Balances	Up to 1 lb (>1 to 5) lb (>5 to 10) lb (>10 to 25) lb (>1 to 50) lb (>50 to 100) lb (>100 to 200) lb (>200 to 500) lb (>500 to 1000) lb (>1000 to 2000) lb Up to 30 g (30 to 60) g (>60 to 120) g (>120 to 500) g	(0.0012 + 0.6*R*) mg (20 + 0.6*R*) mg (25 + 0.6*R*) mg (110 + 0.6*R*) mg (230 + 0.6*R*) mg (510 + 0.6*R*) mg (720 + 0.6*R*) mg (1.2 + 0.6*R*) g (1.6 + 0.6*R*) g (2.3 + 0.6*R*) g (0.02 + 0.6*R*) mg (0.03 + 0.6*R*) mg (0.05 + 0.6*R*) mg (0.07 + 0.6*R*) mg	Class F weights Class 1 weights
Deadweight Testers	Up to 40 000 psi	0.2 % of reading	Weights
Force	Up to 500 lbf (>500 to 100 000) lbf	1.2 g + 0.6*R* 0.35 % of reading	Dead weight, load cells
Mass	Up to 5 mg (>5 to 20) mg (>20 to 50) mg (>50 to 100) mg (>100 to 200) mg >200 mg to 5 g (>5 to 500) g >500 g to 5 kg	0.02 mg 0.0007 mg 0.21 mg 0.0056 mg 0.0023 mg 0.03 mg 0.08 mg 13 mg	Class 1 weights
Torque Wrenches	(0 to 50) in·lb (>50 to 250) in·lb (0 to 200) ft·lb (200 to 400) ft·lb (>400 to 750) ft·lb	0.86 % fsd + 0.6*R* 0.54 % fsd + 0.6*R* 0.82 % fsd + 0.6*R* 2.6 % fsd + 0.6*R* 0.7 % fsd + 0.6*R*	Torque calibrator

Parameter/Equipment	Range	CMC[2] (±)	Comments

Indirect Verification of Rockwell Hardness Testers[3]	HR15N HR15T HR30N HRN30T HRN45N HRN45T HRB High Mid Low HRC High Mid Low	0.24 HR15N 0.31 HR15T 0.29 HR30N 0.33 HR30T 0.23 HR45N 0.4 HRN45T 0.46 HRB 0.65 HRB 1 HRB 0.32 HRC 0.34 HRC 0.44 HRC	Hardness blocks
Pressure	(0 to 30) inHg (1 to 50) psi (50 to 500) psi (500 to 1000) psi (1000 to 5000) psi (5000 to 40 000) psi	(0.07 + 0.6*R*) inHg (0.02 + 0.6*R*) psi (0.12 + 0.6*R*) psi (0.56 + 0.6*R*) psi (1.6 + 0.6*R*) psi 0.2 % of reading	Princo Princo Princo Heise Heise Cosa

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

[2] Calibration and Measurement Capability (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. Calibration and Measurement Capabilities 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; *R* is the numerical value of the resolution of the device in the indicated units.