SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: November 30, 2025 Certificate Number: 1424.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations[1, 6]:

I. Dimensional

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Micrometers	Up to 4 in	(64 + 4*L*) µin	Direct comparison with ASME Grade 0 gauge blocks & optical flats. ASTM D5947-11 Parts 6; 8; Annex A.1.
Calipers (Outside, Inside, Depth Measurements)	Up to 12 in Up to 6 in	320 µin 400 µin	Direct comparison with ASME Grade 0 gauge blocks Master caliper checker
Thickness Gauges[3]			ASTM D3767-03 (2014) parts 9 – 13; ASTM D1056-14 Part 15.3.2; ASTM D751-06 Part 9.1; ISO 815-1 Part 4.4:
Length	Up to 3 in	140 µin	Direct comparison with ASME Grade 0 gauge blocks
Total Mass Applied	(0 to 700) g	290 mg	Direct measurement with electronic balance.

Parameter/Equipment	Range	CMC[2] (±)	Comments
Cutting Dies	Up to 12 in Up to 20 in	320 µin 400 µin	With caliper With CMM
Surface Roughness of Sample Preparation Molds	Ra: (18 to 40) µin	2.2 µin Ra	ASTM D3182 with surface finish measuring machine.

II. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Durometers[4]–			ASTM D2240-15 parts (5 – 10)
Type OO,	(0 to 113) gf	0.29 Duros	Triple beam balance
Type OOO	(0 to 113) gf	0.26 Duros	
Type OOO-S	(0 to 197) gf	0.29 Duros	
Type M	(0 to 79) gf	0.27 Duros	
Type A, B	(0 to 822) gf	0.36 Duros	DuroCalibrator
Type O, E		0.36 Duros	
Type C, D	(0 to 4436) gf	0.36 Duros	
Type DO		0.36 Duros	
Indentor Geometry			
Length	Up to 1 in	770 µin	Optical comparator measurements under magnification 50x overlays (in or out of tolerance check)
Diameter	Up to 1 in	750 µin	
Angle	(0° to 90°)	0.14°	
Radius	Up to 0.5 in	750 µin	
Extension	Up to 1 in	940 µm	

Parameter/Equipment	Range	CMC[2] (±)	Comments
IRHD Hardness Testers	Up to 0.300 mm	140 µin (0.0036 mm) 0.94 points	ASTM D1415-06 ISO 48-9
Micro IRHD	(0.005 to 1) N	0.000 15 N	With Force Gauge
Minor Force on Ball Major Force on Ball Total Force on Ball Force on Foot	(0.0078 to 0.0088) N (0.1450 to 0.1460) N (0.152 to 0.154) N (0.232 to 0.238) N	0.000 15N	Type M force calculation by differential indention
Dimensions: Ball Diameter Foot OD Foot ID	 (0.39 to 0.40) mm (3.20 to 3.50) mm (0.85 to 1.15) mm	330 µin (0.0084 mm)	Direct measurement/ verification with certified calipers & micrometer
IRHD Hardness Testers[4]	(0 to 1.8) mm	140 µin (0.0036 mm) 0.53 points	ASTM D1415-06 ISO 48-9
Type N & S2	(0.005 to 1) N	0.000 15 N	With Force Gauge
	(1 to 10) N	0.0006 N	With Force Gauge
Minor Force on Ball Major Force on Ball Total Force on Ball Force on Foot	(0.27 to 0.31) N (5.39 to 5.41) N (5.67 to 5.73) N (8.15 to 8.45) N	0.000 15 N 0.0006 N	Type N & S2 force calculation by differential indention
Dimensions: Ball Diameter Foot OD Foot ID	 (2.49 to 2.51) mm (19 to 21) mm (5 to 7) mm	330 µin (0.0084 mm)	Direct measurement/ verification with certified calipers & micrometer
Durometer Hardness Test Blocks	All scales	1.5 points	Certified durometer
IRHD Hardness Test Blocks	Type M Type S2 / N	1.2 points 1.1 points	Certified durometer
Resiliometer	(0 to 100) points	1.7 points	ASTM D2632-15 parts (5 – 11)

Parameter/Equipment	Range	CMC[2] (±)	Comments
Mooney Viscometer[3] –	(0 to 100) Mooney units	0.38 Mooney units	ASTM D1646 15 (2012) parts 6; 9; 10-12; 14; 15
Temperature	(20 to 375) °C	0.39 °C	
Rotational Speed	(0 to 5) RPM	0.18 RPM	
Force - Compression	(0 to 1000) lbf (1001 to 2000) lbf (2001 to 3000) lbf (3001 to 4000) lbf (4001 to 5000) lbf	4.8 lbf 9.5 lbf 17 lbf 25 lbf 28 lbf	
Torque	(0 to 73.5) in·lbf (100 Mooney units)	0.28 in·lbf	
Rheometers[3] – (Oscillating Disc Cure Meters, Rotorless Cure Meters/Moving Die type)			ASTM D2084-11, parts 6, 9-12, ASTM D5289-12, part 6, 8-10
RPM Torque	(0 to 5) (12 to 43) in·lbf	0.18 RPM 0.46 in·lbf	
Temperature	(20 to 375) °C	2.6 °C	
Closing Force - Compression	Up to 1000 lbf (1001 to 2000) lbf (2001 to 3000) lbf (3001 to 4000) lbf (4001 to 5000) lbf	4.8 lbf 9.5 lbf 17 lbf 24 lbf 28 lbf	
Plastometer –			ASTM D926-08 (2013) parts 5; 9; 10; 11.
Plate Distance	Up to 1 in	300 µin	
Force - Compression	(0 to 25) lbf	0.012 lbf	

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Brittleness Point Tester[3] & Temperature Retraction Tester[3]			ASTM D2137-15, part 5 & ASTM D746-14, part 6 for Brittleness Point direct verification with radius gauge
Bath Temperature Striker Radius	(0 to -90) °C Up to 25.4 mm	0.8 °C 780 µin	
Bath Temperature Length Indication	(0 to -90) °C (150 mm, 50 mm)	0.80 °C 320 µin	ASTM D1329-08, part 5 for temperature retraction & direct comparison with length standards
Scales & Balances[3]			ASTM E898
	(0 to 500) mg	0.31 mg	with OIML E2 weights
	(1 to 2000) g	0.0072 g	
Mass	(>1 to 500) mg (>1 to 200) g (>1 to 2000) g	0.059 mg 0.42 mg 12 mg	Direct comparison with OIML E2 weights
Rotary Platform - Abraser[3] (Abrader)			ASTM D3389-15, part 5; Manufacturer's instructions
RPM Vacuum Table TIR	72 RPM (40 to 80) in H_2O 0.002 in	0.18 RPM 1.6 in H_2O 580 µin	
Weights	250 g 500 g 1000 g	0.014 g 0.014 g 0.014 g	
Shore Durocalibrator –			
Shore A Scale Shore D Scale	(0 to 822) g (0 to 4536) g	0.21 points 0.22 points	NAVAIR 17-20MF-17 Comparison with weights

Parameter/Equipment	Range	CMC[2] (±)	Comments
Brookfield Viscometer[3] (~ 23 °C)	@10 cP nominal @1000 cP nominal @5000 cP nominal @12 500 cP nominal @100 000 cP nominal	0.38 cP 13 cP 67 cP 200 cP 1100 cP	ASTM D2196-15, part 5; 6; 7; 11; 15 with CRMs
RPM – Contact/Optical[3]	(1 to 999.9) rpm	0.18 rpm	Direct measurement with tachometer
Tensile Testing Machines[3] – Force – Tension & Compression	 (25 to 250) lbf (250 to 1000) lbf (1001 to 2000) lbf (2001 to 3000) lbf (3001 to 4000) lbf (4001 to 5000) lbf	 1.1 lbf 4.8 lbf 9 lbf 16 lbf 24 lbf 28 lbf	ASTM E4 -16, parts 7; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 22; 23.
Extensometer[3] – Distance	 Up to 12 in	 620 µin	 ASTM E83-16 parts 4; 5 7; 8.
Torque Wrenches	4 lbf·in to 600 lbf·ft	0.79 % rdg	ASME B107.300
Pressure Gages	(0 to 6) psig (>6 to 30) psig (>30 to 100) psig (>100 to 500) psig (>500 to 1000) psig (>1000 to 5000) psig (>1000 to 3000) psig (>5000 to 15 000) psig	0.02 psi 0.1 % rdg + 0.1 psi 0.18 psi 0.1 % rdg + 0.8 psi 2.0 psi 0.1 % rdg + 0.78 psi 5.3 psi 0.1 % rdg + 2.3 psi	ASME B40.100

III. Thermodynamics

Parameter/Equipment	Range	CMC[2] (±)	Comments
Oven Calibration[3] –			ASTM E145-94 (2011), part 4.1, ASTM D7969-16, parts 4; 5; 6; 7; X.1 using Digital survey recorder with Type K thermocouple;
Temperature	(68 to 707) °F	1.3 °F	
Air Flow Velocity	(10 to 500) ft/min	1.5 ft/min + 1.4 % rdg	Vane anemometers
Air Flow Velocity	(0 to 5) m/s (0 to 10) m/s (0 to 30) m/s (0 to 45) m/s	0.11 m/s 0.39 m/s 0.69 m/s 0.79 m/s	Hot wire anemometer
Ozone Monitors & Chambers[3]	(0 to 10) parts in 10^8 (pphm) (10 to 100) parts in 10^8 (pphm)	0.11 parts in 10^8 1 part in 10^8	ASTM D4575-09 (2015), part 6; 7; 8; 9; 10; 15 X1; X2 ASTM D1149-07, parts 5; 7;11; 15; 18; 21 field service available for chamber only
Temperature – Dry Well Calibrators	(-90 to 0) °C (0 to 375) °C	0.36 °C 0.36 °C	Direct measurement
Temperature – Measuring Devices	(25 to 100) °C (101 to 375) °C	0.37 °C 0.6 °C	Dry well temperature calibrator

IV. Time & Frequency

Parameter/Equipment	Range	CMC[2] (±)	Comments
Testing Machines – Time Measurement[3]	Up to 2 h Up to 120 s	0.84 s 0.84 s	Direct measurement & verification ASTM D2240-15, part 5.1 operating stand rate of descent

[1] This laboratory offers commercial and field calibration 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] Calibration is performed according to manufacturer specifications and measured in units of gram force.

[5] In the statement of the CMC, L is the numerical value of the nominal length of the device measured in inches and R is the resolution of the device under test.

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

Accredited Laboratory

A2LA has accredited

CORPORATE CONSULTING, SERVICE, & INSTRUMENTS, INC.

Akron, OH

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 15th day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1424.01
Valid to November 30, 2025

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