



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

POLYMER TESTING INSTRUMENTS, INC.
74 Patton Ave.
Asheville, NC 28801
Larry Eisner Phone: 828 252 1326

CALIBRATION

Valid To: June 30, 2019

Certificate Number: 1504.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Cutting Dies	Up to 8 in	310 µin	Caliper, optical
Dial and Electronic Indicators ³	Up to 1 in	120 µin	Gage blocks
Calipers ³	Up to 8 in	310 µin	Caliper master
Micrometers ³	Up to 1 in	140 µin	Gage blocks

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators ³ – Generate and Measure Type J Type K Type T	 (-210 to 1200) °C (-200 to 1372) °C (-250 to 400) °C	 0.22 °C 0.23 °C 0.23 °C	 Omega / Martel CL3001
Electrical Calibration of RTD Indicators ³ – Generate and Measure Pt 385, 100 Ω Pt 385, 1 kΩ Pt 3902, 100 Ω Pt 3926, 100 Ω Cu 427, 10 Ω	 (-200 to 800) °C (-190 to 630) °C (-200 to 630) °C (-200 to 630) °C (-100 to 260) °C	 0.18 °C 0.18 °C 0.18 °C 0.18 °C 0.18 °C	 Omega / Martel CL3001

III. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Force – Measure ³	(0 to 500) lbf	0.062 % of full scale	ASTM E4 w/ load cells
Force Gages and Tensile Testers	(200 to 2000) lbf (2000 to 5000) lbf	0.14 % of full scale 0.14 % of full scale	Load cell comparison
Crosshead Speed	(0 to 20) in/min	0.037 in/min	Calibrated scale and stop watch
Torque Wrenches	(0 to 177) in·lbf	0.76 in·lbf	Torque tester
Pressure ³	(0 to 2000) psi (2000 to 10 000) psi	0.11 % of full scale 0.11 % of full scale	Deadweight tester
Vacuum ³	(0 to 30) inHg	0.71 inHg	Master gage lab transducer field



Parameter/Equipment	Range	CMC ² (±)	Comments
Rotational Speed ³ , Non-Contact	(0 to 2000) rpm	2.4 rpm	Tachometer
Verification of Scales and Balances ³ – Resolution (R): R = 0.1 g R = 0.01 g R = 0.0005 g R = 0.1 g R = 0.01 g R = 0.0005 g R = 0.1 g R = 0.01 g R = 0.1 g R = 0.01 g	 Up to 1 g Up to 1 g Up to 1 g Up to 200 g Up to 200 g Up to 200 g Up to 1000 g Up to 1000 g Up to 4000 g Up to 4000 g	 58 mg 5.8 mg 0.3 mg 58 mg 5.9 mg 0.89 mg 58 mg 6.7 mg 62 mg 23 mg	Class 1 weights

IV. Plastic Industry Specific Measurements

Parameter/Equipment	Range	CMC ² (±)	Comments
Extrusion Plastometer Melt Flow Index ³ – Temperature Bore Shaft-Inside Diameter Piston Foot Diameter Mass	 (0 to 400) °C Up to 0.4 in Up to 1 in (0 to 5) kg	 0.35 °C 300 μin 300 μin 0.07 %	ASTM D1238

V. Rubber Industry-Specific Measurements

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Extensometer ³ – Gage Length	Class D	0.007 in	ASTM E83 w/ calibrated scale
Rubber Hardness – Block Standardization			
Shore A	(0 to 100) units	0.71 “A” units	
Shore C	(0 to 100) units	0.71 “C” units	
Shore D	(0 to 100) units	0.71 “D” units	
Shore M	(0 to 100) units	0.71 “M” units	
IRHD M	(0 to 100) units	0.61 units	
Direct Verification of Durometers –			ASTM D2240
Indentor Extension and Shape –			
Diameter	(0 to 25) mm	100 μin	Optical inspection under magnification or video comparator
Radius	(0 to 25) mm	100 μin	
Angle	(0 to 90)°	0.4°	
Extension	(0 to 25) mm	100 μin	
Indentor Display	(0 to 100) Duro	0.58R + 12 μDuro	Gage blocks
Spring Calibration – Force			
Types Shore A	(0 to 100) Duro	0.6 Shore A units	
Type Shore C	(0 to 100) Duro	0.61 Shore C Units	
Types Shore D	(0 to 100) Duro	0.61 Shore D units	
Types JIS A	(0 to 100) Duro	0.58 JIS A units	
Types IRHD	(0 to 100) Duro	0.61 IRHD units	
Types Shore M	(0 to 100) Duro	0.85 Shore M units	
Types Shore 0,00	(0 to 100) Duro	0.59 Shore 0,00 units	

Parameter/Equipment	Range	CMC ² (±)	Comments
Rheometer ³ – Torque @ (0.5, 1, 3) degrees arc	(0 to 200) in·lbf	0.14 in·lbf	Torque standard ASTM D2084 ASTM D5289
Mooney Viscometer ³	(0 to 200) Mooney	0.12 Mooney	ASTM D1646

VI. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature – Measure ³	(-200 to 350) °C	0.35 °C	RTD/Thermocouple; calibration of various temperature devices such as oil baths and ovens
Relative Humidity – Measure ³	(10 to 75) % RH	1.3 % RH	Vaisala HMI41 & HMP46

VII. Time and Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Time Interval ³	(0 to 100) hr	3 s/day	Digital stop watch

¹ This laboratory offers commercial 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 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, *R* is defined as the resolution of the device measured in Duros.