



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

NATIONAL CALIBRATION INC.
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CALIBRATION

Valid To: December 31, 2023

Certificate Number: 2639.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 5}:

I. Mechanical

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Indirect Verification of Rockwell Hardness Testers and Rockwell Superficial Hardness Testers ³	HRA: High (>80) Medium (70 to 79) Low (60 to 69) HRBW: High (>80) Medium (51 to 79) Low (10 to 50) HRC: High (>60) Medium (40 to 59) Low (20 to 39) HREW: High (>80) Medium (75 to 78) Low (65 to 74)	0.15 HRA 0.16 HRA 0.26 HRA 0.44 HRBW 0.29 HRBW 0.37 HRBW 0.32 HRC 0.33 HRC 0.38 HRC 0.56 HREW 0.56 HREW 0.45 HREW	ASTM E18, ASTM E110, ISO 6508-2

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Indirect Verification of Rockwell Hardness Testers and Rockwell Superficial Hardness Testers ³ (cont)	HRFW: High (>94) Med (80 to 90) Low (60 to 75) HRLW: High (>115) HR15N: High (>90) Med (80 to 89) Low (60 to 79) HR15TW: High (>88) Medium (80 to 87) Low (60 to 79) HR15YW: High (>94) Medium (85 to 93) HR30N: High (>77) Medium (60 to 76) Low (40 to 59) HR30TW: High (>70) Med (55 to 69) Low (30 to 54) HR45N: High (>67) Medium (50 to 66) Low (20 to 49) HR45TW: High (>50) Medium (18 to 49) Low (1 to 17) HRRW	0.45 HRFW 0.45 HRFW 0.45 HRFW 0.29 HRLW 0.50 HR15N 0.46 HR15N 0.40 HR15N 0.29 HR15TW 0.25 HR15TW 0.42 HR15TW 0.46 HR15YW 0.96 HR15YW 0.28 HR30N 0.30 HR30N 0.31 HR30N 0.33 HR30TW 0.42 HR30TW 0.56 HR30TW 0.16 HR45N 0.46 HR45N 0.45 HR45N 0.40 HR45TW 0.61 HR45TW 0.62 HR45TW 0.31 HRRW	ASTM E18, ASTM E110, ISO 6508-2

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Leeb Hardness Testers ³	(300 to 900) LD	7.3 LD	ASTM A956
Indirect Verification of Brinell Hardness Testers ³	HBW: High (500 to 600) Medium (300 to 400) Low (100 to 200)	6.2 HBW 2.9 HBW 1.7 HBW	ASTM E10, ASTM E110
Indirect Verification of Vickers Hardness Testers (>1 kgf) ³	HV: Low (100 to 240) Medium (>240 to 600) High >600	3.6 µm 2.5 µm 1.9 µm	ASTM E92, ISO 6507-2
Indirect Verification of Microindentation Hardness Testers (Knoop and Vickers) ³	Vickers (<1 kgf) >600 HV (240 to 600) HV Knoop (<1 kgf) >650 HK (250 to 650) HK	0.13 µm 0.63 µm 0.43 µm 1.2 µm	ASTM E92, ASTM E384, ISO 6507-2
Direct Verification of Brinell Testers ³ –			ASTM E10
Verification of the Test Force	(500 to 3000) kgf	0.15 % of indicated load	Verification of the test force is by load cell per the method of ASTM E4
Verification of the Device for Measuring Indentation Diameters	(0 to 7) mm	0.004 mm	Stage micrometer

Parameter/Equipment	Range	CMC ² (±)	Comments
Force ³ – Measure			ASTM E4
Tension	(20 to 500) lbf (200 to 10 000) lbf	0.13 % of indicated load 0.07 % of indicated load	Load cells
Compression	(20 to 500) lbf (200 to 10 000) lbf	0.12 % of indicated load 0.07 % of indicated load	
Tension Compression	(0.5 to 200) lbf (0.5 to 200) lbf	0.16 % of indicated load 0.16 % of indicated load	Dead weights

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 For Rockwell scales using ball indentors, both steel (S) and tungsten carbide (W) are used. The CMC is reflected for the tungsten carbide balls only.

⁵ This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

NATIONAL CALIBRATION INC.

Oakville, Ontario, CANADA

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 NCSL Z540-1-1994 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 6th day of April 2022.

A blue ink signature of a person, likely the Vice President, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2639.01
Valid to December 31, 2023

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