



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

LECO CORP., OPTICAL SERVICE DEPT.
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St. Joseph, MI 49085
Tim Bonge Phone: 269 982 2385

CALIBRATION

Valid To: June 30, 2020

Certificate Number: 1845.01

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
Length – Metallographic Linear Reticles ³	(40 to 600) Divisions	0.35 nm/division	ASTM E1951 based on a 600 division OSM
Pixel Calibration of Image Analysis/Video Measurement Systems ³	≤ 20 MP Source Up to (5120 by 4096) Pixels	2.9 nm	ASTM E1951 and LECO AMH43 based on 3800x total magnification
Calibration of Microscopic Stage Micrometers	Up to 155 mm	1.0 nm	ASTM E1951, LECO AMH43, and image analysis application with NIST specimen

II. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Knoop and Vickers Hardness Testers ³ –			
Vickers Loads ≥ 2 kg	Low Range Mid Range High Range	1.1 % of certified diag. 0.78 % of certified diag. 0.6 % of certified diag.	ASTM E92
Vickers Loads ≤ 1 kg	Low Range Mid Range High Range	0.71 % of certified diag. 0.44 % of certified diag. 0.3 % of certified diag.	
Knoop Loads ≤ 1 kg	Low Range Mid Range High Range	0.68 % of certified diag. 0.42 % of certified diag. 0.2 % of certified diag.	
Knoop Load 2 kg	Low Range Mid Range High Range	1.5 % of certified diag. 1.6 % of certified diag. 1.5 % of certified diag.	
Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers ³	HRBW: Low Medium High HRC: Low Medium High HREW: Low Medium High HR30N: Low Medium High HR30TW: Low Medium High	0.66 HRBW 0.54 HRBW 0.43 HRBW 0.35 HRC 0.33 HRC 0.31 HRC 0.46 HREW 0.41 HREW 0.41 HREW 0.41 HR30N 0.36 HR30N 0.31 HR30N 0.50 HR30TW 0.42 HR30TW 0.34 HR30TW	ASTM E18

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.



Accredited Laboratory

A2LA has accredited

LECO CORP., OPTICAL SERVICE DEPT.

St. Joseph, MI

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 the requirements of ANSI/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 17th day of December 2018.

A blue ink signature of the Senior Director of Accreditation Services.

Senior Director, Accreditation Services
For the Accreditation Council
Certificate Number 1845.01
Valid to June 30, 2020

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