



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

TROXLER ELECTRONICS LABORATORIES, INC.
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CALIBRATION

Valid until: November 30, 2018

Certificate Number: 3260.05

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
Calibration of Height Measurement System of the Gyrotory Compactor ³	(113 to 115) mm	0.078 mm	Troxler gyrotory compactor height standard
Calibration of Angle Measurement System of the Gyrotory Compactor using the DAV ³	1.0° to 1.3°	0.14°	Dynamic angle verifier
Gyrotory compactor Mold Internal Diameter ³	(149.0 to 151.0) mm	1.0 x 10 ⁻² mm	Bore micrometer
Gyrotory Compactor Ram Head and End Plate External Diameter ³	(149.0 to 150.0) mm	1.8 x 10 ⁻² mm	External micrometer

Parameter/Equipment	Range	CMC ² (±)	Comments
Calipers ³	Up to 12 in	1.1×10^{-4} in	Gage blocks
Micrometers ³	Up to 12 in	1.1×10^{-4} in	Gage blocks
Concrete Type B Air Meter Measurement Bowl Volume	(0.20 to 0.30) ft ³	8.8×10^{-3} % air in concrete	Equivalent water volume
Concrete Type B Air Meter Measurement Bowl Diameter-to-Height Ratio	0.75 to 1.25	3.9×10^{-5}	Caliper

II. Mechanical

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Calibration of Rotational Frequency of the Gyrotory Compactor ³	(0 to 35) RPM	0.15 RPM	Laser tachometer
Density			
Secondary Density Blocks ³	(1760 to 2725) kg/m ³	0.38 % rdg	Master gauge
Troxler Tracker Portable Gauge Calibration System ³	(1740 to 2620) kg/m ³	$(7.4 \times 10^{-6}D^2 - 3.6 \times 10^{-3}D + 0.68)$ % rdg	Master gauge



Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Water Mass Per Unit Volume –			
Tertiary Moisture Blocks ³	(555 to 615) kg/m ³	1.5 % rdg	Master gauge
Troxler Tracker Portable Gauge Calibration System ³	(110 to 375) kg/m ³	1.5 % rdg	Master gauge
Client Surface Moisture/Density Gauges, Density Measurement System ³ –			
Backscatter	(1740 to 2626) kg/m ³	1.3 % rdg	Secondary density blocks
Other Positions	(1740 to 2626) kg/m ³	$(1.9 \times 10^{-5}D^2 - 0.0058D + 1.1)$ % rdg	
Backscatter	(1850 to 2550) kg/m ³	1.6 % rdg	
Other Positions	(1740 to 2620) kg/m ³	$(-2.5 \times 10^{-3}D + 2.1)$ % rdg	Troxler tracker portable gauge calibration system
Client Surface Moisture/Density Gauges, Moisture System ³	(0 to 615) kg/m ³	3.4 % rdg	Tertiary moisture blocks
	(0 to 375) kg/m ³	3.4 % rdg	Troxler tracker portable gauge calibration system



Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Client Thin Layer Density Gauges ³ For Low Density Top Layer, High Density Bottom Layer For High Density Top Layer, Low Density Bottom Layer	Density: (1740 to 2585) kg/m ³ Top Layer Thickness: (25.4 to 101.6) mm Density: (1740 to 2585) kg/m ³ Top Layer Thickness: (25.4 to 101.6) mm	(0.0030T ² - 0.25T + 9.5) % rdg (0.00158T ² - 0.131T + 4.3) % rdg	Secondary density blocks and primary thin layer plates
Scale and Balances ³	1500 g to 30 kg	0.00012 % of applied load	Dead weights
Calibration of Pressure System of the Gyrotory Compactor ³	(590 to 610) kPa	3.6 kPa	Load cell
Calibration of Pressure System of the Concrete Type B Air Meter	(0 to 15) percent air	0.029 % air	The pressure dial on the concrete air meter measures pressure, but is calibrated to correlate air content of the concrete specimen being measured to pressure.
Calibration of the Calcium Carbide Gas Pressure Tester (the "Speedy")	(0 to 20) percent water content	0.038 % water content	The pressure dial on the Speedy measures pressure, but is calibrated to correlate water content of the soil specimen being measured to pressure.

¹ This laboratory offers commercial calibration service 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, D is the gauge measurement depth in millimeters, T is the top layer thickness in millimeters.

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Accredited Laboratory

A2LA has accredited

TROXLER ELECTRONIC LABORATORIES, INC.

Orlando, FL

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/NCSLI 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 8 January 2009).



Presented this 2nd day of December 2016.

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President and CEO
For the Accreditation Council
Certificate Number 3260.05
Valid to November 30, 2018

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