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

TROXLER ELECTRONICS LABORATORIES, INC.
James Pratt Phone: 919 314 2707

CALIBRATION

Valid To: *See Footnote 6* Certificate Number: 3260.01

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. Dimensional

Parameter/Equipment	Range	CMC[2] (±)	Comments	Locations[6]
Calibration of 114.3 mm Nominal Height Standards Used for Gyratory Compactor Calibration	(114.0 to 115.0) mm	0.013 mm	CMM	RTP
Calibration of Angle Fixture for Dynamic Angle Verification Kit (DAV)	-1.400º to 1.400º	2.3×10^{-3} º	CMM	RTP
Calibration of Dynamic Angle Verification Kit (DAV)	-1.380º to 1.380º	0.11º	Angle fixture for dynamic angle verifier	RTP
Calibration of Height Measurement System of the Gyratory Compactor[3]	(113 to 115) mm	0.078 mm	Troxler gyratory compactor height standard	RTP, HOU, ORL, RAN

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Parameter/Equipment	Range	CMC[2] (±)	Comments	Locations[6]
Calibration of Angle Measurement System of the Gyratory Compactor Using the RAM[3]	(1.0 to 1.3)º	2.1×10^{-2} º	RAM	RTP, HOU, ORL
Gyratory Compactor Mold Internal Diameter[3]	(149.0 to 151.0) mm	1.0×10^{-2} mm	Bore micrometer	RTP, HOU, ORL, RAN
Gyratory Compactor Ram Head and End Plate External Diameter[3]	(149.0 to 150.0) mm	1.8×10^{-2} mm	External micrometer	RTP, HOU, ORL, RAN
Gyratory Compactor Mold Height	(245.0 to 255.0) mm	0.015 mm	CMM	RTP
Gyratory Compactor Mold Wall Thickness	(7.0 to 8.0) mm	0.13 mm	CMM, bore micrometer	RTP
Gyratory Compactor Mold Inside Surface, Ram Head and End Plate Surface Rq Value	Up to 5.00 µm	0.20 µm	Surface texture tester	RTP
AFLS1 Rapid Internal Angle Measurement Calibration Tube, Dihedral Angle	(1.0 to 1.3)º	1.0×10^{-2} º	CMM	RTP
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	ORL, FMY
Concrete Type B Air Meter Measurement Bowl Diameter-to-Height Ratio	0.75 to 1.25	3.9×10^{-5}	Caliper	ORL, FMY

Parameter/Equipment	Range	CMC[2] (±)	Comments	Locations[6]
Slump Mold Upper Opening Diameter	(3.74 to 4.25) in	1.3×10^{-2} in	Caliper	ORL, FMY
Slump Mold Base Opening Diameter	(7.75 to 8.25) in	1.5×10^{-2} in	Caliper	ORL, FMY
Slump Mold Height	(11.75 to 12.25) in	8.4×10^{-3} in	Caliper	ORL, FMY
Slump Mold Wall Thickness	(0.07 to 0.13) in	4.7×10^{-3} in	Micrometer	ORL, FMY

II. Mechanical

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments	Location[6]
Calibration of Rotational Frequency of the Gyratory Compactor[3]	(0 to 35) RPM	0.15 RPM	Laser tachometer	RTP, HOU, ORL, RAN
Density – Primary Density Blocks	(1760 to 2725) kg/m^3	0.029 % rdg	CMM, weight determinations	RTP
Density – Secondary Density Blocks[3]	(1760 to 2725) kg/m^3	0.47 % rdg	Master gauge	RTP, HOU, ORL, RAN, FMY[7]
Density – Troxler Tracker Portable Gauge Calibration System[3]	(1740 to 2620) kg/m^3	$(1.0 \times 10^{-5} D^2 - 4.0 \times 10^{-3} D + 0.65)$ % rdg	Master gauge	RTP, ORL

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments	Location[6]
Water Mass Per Unit Volume –				
Secondary Moisture Blocks	(370 to 823) kg/m^3	4.4 % rdg	Master gauge	RTP
Water Mass Per Unit Volume –				
Tertiary Moisture Blocks[3]	(555 to 615) kg/m^3	3.9 % rdg	Master gauge	RTP, HOU, ORL, RAN, FMY[7]
Water Mass Per Unit Volume –				
Troxler Tracker Portable Gauge Calibration System[3]	(110 to 375) kg/m^3	6.8 % rdg	Master gauge	RTP, ORL
Master Gauge Calibration, Density Measurement System	(1760 to 2725) kg/m^3	0.11 % rdg	Primary density blocks	RTP
Master Gauge Calibration, Water Mass Per Unit Volume Measurement System	(373 to 804) kg/m^3	4.0 % rdg	Secondary water blocks	RTP
Client Surface Moisture/Density Gauges, Density Measurement System[3] –				
Backscatter	(1740 to 2626) kg/m^3	1.3 % rdg	Secondary density blocks	RTP, HOU, ORL, RAN, FMY[7]
Other Positions	(1740 to 2626) kg/m^3	$(1.3 \times 10^{-5} D^2 - 0.0048D + 0.70)$ % rdg		

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments	Location[6]
Client Surface Moisture/Density Gauges, Density Measurement System[3] –				
Backscatter	(1850 to 2550) kg/m^3	1.3 % rdg	Troxler tracker portable gauge calibration system	RTP, ORL
Other Positions	(1740 to 2620) kg/m^3	(-2.3 x 10^{-3}*D* + 1.8) % rdg		
Client Surface Moisture/Density Gauges, Moisture System[3]	(0 to 615) kg/m^3	5.1 % rdg	Tertiary moisture blocks	RTP, HOU, ORL, RAN, FMY[7]
Client Surface Moisture/Density Gauges, Moisture System[3]	(0 to 375) kg/m^3	4.1 % rdg	Troxler tracker portable gage calibration system	RTP, ORL
Client Thin Layer Density Gauges[3] –				
For Low Density Top Layer, High Density Bottom Layer	Density: (1740 to 2585) kg/m^3 Top Layer Thickness: (25.4 to 101.6) mm	(0.0020*T*^{2} - 0.18*T* + 7.8) % rdg	Secondary density blocks and primary thin layer plates	RTP, HOU, ORL, RAN, FMY[7]
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	(-0.0012*T*^{2} + 0.095*T* -0.21) % rdg		
Calibration of Load Cell for Gyratory Compactor Pressure Calibration	(790 to 5010) lbf	7.1 lbf	Force gauge	RTP

Parameter/Equipment	Range	CMC[2] (±)	Comments	Location[6]
Scales and Balances[3]	1500 g to 30 kg	0.000 29 % of applied load	Standard weights	RTP, HOU, RAN
Scales and Balances[3]	Up to 30 kg	0.000 29 % of applied load	Standard weights	ORL, FMY[7]
Calibration of Pressure System of the Gyratory Compactor[3]	(590 to 610) kPa	3.6 kPa	Load cell	RTP, HOU, ORL, RAN
Rockwell C Hardness of Gyratory Mold, End Plate, and Ram	(45 to 70) Rockwell C Hardness	1.6 Rockwell C Hardness	Hardness meter	RTP
Calibration of Pressure System of the Concrete Type B Air Meter	(0 to 15) % Air	0.12 % 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	ORL, FMY
Calibration of the Calcium Carbide Gas Pressure Tester (the “Speedy”)	(0 to 20) % Water Content	0.062 % 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	ORL, FMY
Volume – Measuring Bowl of Concrete Volumetric Air Content Meter	≥ 2 liters	0.062 % rdg	Thermometer, scale	ORL, FMY

Parameter/Equipment	Range	CMC[2] (±)	Comments	Location[6]
Percent Air Content – Concrete Volume Divided by Measuring Bowl Volume	(0 to 15) % Air	0.070 % Air	Thermometer, scale	ORL, FMY
Ratio of Calibrated Cup Volume Divided by Measuring Bowl Volume	1 % ± 0.04 % of the Volume of the Measuring Bowl	0.0058 % rdg	Thermometer, scale	ORL, FMY
Ratio of the Meter Top Section Volume Divided by Measuring Bowl Volume	Ratio ≥ 1.2	0.0019 rdg	Thermometer, scale	ORL, FMY
Ratio of Measuring Bowl Diameter Divided by Measuring Bowl Height	Ratio ≥ 1 But Less Than or Equal to 1.25	0.040 rdg	Thermometer, scale, bore micrometer	ORL, FMY

[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. 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.

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

[6] The locations of the laboratories that can perform the calibration are given by a three-letter code with valid to dates given in the table below:

Location	Code	Valid to Dates
3008 E. Cornwallis Rd., Research Triangle Park, NC 27709	RTP	April 30, 2026
2500 Central Parkway, Suite L, Houston, TX 77092	HOU	July 31, 2025
531 Holts Lake Ct, Apopka, FL 32703	ORL	May 31, 2025
11300 Sanders Dr., Rancho Cordova, CA 95742	RAN	November 30, 2024
1681 Benchmark Ave, Fort Myers, FL 33905	FMY[7]	May 31, 2025

[7] This location does not perform field service activity

Accredited Laboratory

A2LA has accredited

TROXLER ELECTRONIC LABORATORIES, INC.

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 23rd day of February 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3260.01
Valid To: See Scope of Accreditation

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