



SCOPE OF ACCREDITATION TO ISO/IEC 17043:2023

METROLOGOS ESPECIALIZADOS E INGENIEROS ELÉCTRICOS S. DE R.L. DE C.V.

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PROFICIENCY TESTING PROVIDER

Valid To: June 30, 2026

Certificate Number: 4853.01

In recognition of the successful completion of the A2LA evaluation process, this proficiency testing provider has been found to meet the ISO/IEC 17043:2023, “Conformity Assessment-General Requirements for Proficiency Testing.” Therefore, in recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this provider to offer the following proficiency testing programs*:

Proficiency Testing Programs for the Calibration Area		
PT Scheme	Type of PT Items***	Properties Measured
FLUID	Volume of water: (flow) Test of cold drinking water meters DN15; DN 20; DN 25, DN 50 by the collection method ^{1, 2, 3}	Volume
	Volume: Calibration of vertical and horizontal cylindrical tanks and volumetric container (Large Volumes; medium volumes; small and micro volumes) ^{1, 2, 3}	Volume
	Flow: Calibration of mass flow meters and volumetric flow ^{1, 2}	Flow
	Calibration gas detectors and gas analyzers ^{2, 3}	Substance concentration CH ₄ , CO, HC, CO ₂ , O ₂ , NO _x , C ₆ H ₁₄ , C ₃ H ₈
DENSITY	Calibration of digital densimeters for dynamic measurement and immersion densimeters; hydrometers; breathalyzers (alcoholmeters); aerometers; lactodensimeters; acidometers; alcohol hydrometers; ethyl breath hydrometers; cell breathalyzers (ph meters); breath alcohol meters; ethyl meters	Mass, volume, substance concentration
DIMENSIONAL	1D – Portable gauging and hand tools Length – outdoor micrometer calibration (dial indicator; probes) ^{2, 3}	Dimensional (length)
	Indoor and outdoor micrometer calibration (Vernier type meter calibration; vernier caliper; goniometers); graduated ribbons (graduated rulers), gauge, lever type indicator (stem) ^{2, 3}	Dimensional (length)
MECHANICAL	Calibration of pressure manometers (pressure transducers and sphygmomanometer) ^{2, 3}	Pressure
	Calibration for vacuum gauges; barometers ^{2, 3}	Pressure

Proficiency Testing Programs for the Calibration Area		
PT Scheme	Type of PT Items***	Properties Measured
ELECTRICAL	Measurement procedures for energy meters (watthourmeters): Calibration by the energy comparison method; calibration by the pulse comparison method; verification of the constant test by the revolution or pulse counting method; verification of the constant test by the energy dosage; start-up test by the revolutions or pulses method; operation without load test in static meters by the pulse count method ^{1, 2, 3}	Electrical energy
	Calibration of instruments transformers of measure voltage and electric current ^{1, 2, 3}	Electrical energy, electrical voltage and electrical current
	Calibration of test equipment for energy meters (EPM) ^{1, 2, 3}	Electrical energy, electrical voltage and electrical current
	Calibration of digital multimeters (from 4 ½ to 6 ½ digits); megohmmeters; voltiamperimetric clamps; calibration of voltage and electrical current sources; ammeter; conductivity (frequency signal in c.a.) ^{2, 3}	Voltage in c.c. current in c.c., resistance Ω , voltage in c.a., current in c.a.; capacitance; electric power
THERMODYNAMICS	Calibration of direct reading thermometers (TLD; TLV; RTD; TRP; infrared and thermocouples, isothermal media in temperature) ^{2, 3}	Temperature
	Calibration for thermohygrometers (humidity sensor) ^{2, 3}	Temperature and relative humidity
FORCE	Calibration method for torque meters ¹	Force
MASS AND WEIGHT	Calibration of instruments to weigh non-automatic or automatic operation (IPFNA) ¹ ; Weight calibration ¹	Mass

Proficiency Testing Programs for the Testing Area		
PT Scheme	Type of PT Items***	Properties Measured
VOLUME TESTING	Various types of consumer and industrial objects ^{2, 3}	Volumetric expansion, tightness, hydrostatic pressure and rupture, volume-hermeticity, tightness
ELECTRICAL, ENERGY, MECHANICAL METAL	Protection against access to living parts ^{2, 3}	Electrical voltage and electrical current
	Various types of consumer products and industrial objects ^{2, 3}	Electrical voltage, power consumption, electrical current, and electric power
	Heating (flame test, test glow wire) ^{2, 3}	Temperature
	Various types of consumer products and industrial objects ^{2, 3}	Dielectric leakage, current, endurance and resistance (insulation); resistance (ik, IP (impact) and marked)
	Protection against overloading of transformers and associated circuits (abnormal operation)	Temperature

Proficiency Testing Programs for the Testing Area		
PT Scheme	Type of PT Items***	Properties Measured
ELECTRICAL, ENERGY, MECHANICAL METAL (cont.)	Various types of consumer products and industrial objects ^{2, 3}	Dielectric strength (insulation requirements) endurance and resistance; ground connection
	Various types of consumer products and industrial objects ^{2, 3}	Insulation resistance and resistance
ELECTRICAL	Determination of the diameter and cross-sectional area of the electric conductors ^{2, 3}	Dimensional
	Determination of electrical resistance to direct current, tension and elongation of conductor wires ^{2, 3}	Resistance and tension
	Determination of the cross-sectional area of electric conductors according to their mass ^{2, 3}	Dimensional
	Determination of the dielectric rupture by flat electrodes and semi-spherical in dielectric oils, industrial oils ³	Dielectric breakdown voltage
	Determination of the power factor in dielectric oils, industrial oils ³	Electric power factor
	Security procedures for transformers (distribution and power transformers and autotransformers) ^{1, 2, 3}	Ohmic resistance, voltage, current and electrical power, impedance and temperature
ENERGY EFFICIENCY TEST	Consumer products where volumes and storage requirements are essential (refrigerators (coolers) for domestic and industrial use) ^{1, 2, 3}	Energy consumption, electric consumption and temperature, time (pull down), volume, storage test
	Energy efficiency of washing machines ^{1, 2}	Energy, consumption electric and temperature
	Measurements to determine energy consumption, water consumption and program duration (clothes dryer electrical; air conditioners); energy consumption of the motor pump unit ^{1, 2, 3}	Energy, consumption electric and temperature, flow
	Measurements to determine energy consumption, water consumption and program duration (dishwasher) ^{1, 2, 3}	Energy, consumption electric and temperature, flow
	Heating devices (electric ovens, stoves, kitchens) ^{2, 3}	Energy consumption, consumption electric and temperature, flow, time

Proficiency Testing Programs for the Testing Area		
PT Scheme	Type of PT Items***	Properties Measured
CHEMISTRY	Content of polychlorinated biphenyls (PCB'S) in dielectric oils (mineral, vegetable, silicone), soils (solid), industrial oils ³	Identification and quantitation of BPC's
	Determination of neutralization number in dielectric oils, industrial oils ³	Amount of substance
	Determination of kinetic viscosity at 40 °C in dielectric oils, industrial oils petroleum derivatives ³	Mass
	Determination of relative density (specific gravity or API gravity) in dielectric oils, industrial oils petroleum derivatives, gasoline ³	Density
	Determination of water content by method Karl Fischer in dielectric oils, industrial oils, petroleum derivatives, dielectric lubricants ³	Water content
	Standard test method for analyzing gases dissolved in electrical insulating oils by gas chromatography determination of total gas (TOGAS) ³	Gas concentration
	Sampling in waters, which includes sampling of wastewater and sampling of receiving bodies (DQO and DBO) ³	Alkalinity, total chlorine, chlorides, electrical conductivity, DQO, DBO, total hardness, fats and oils, ammonia nitrogen, total Kjeldahl nitrogen, pH, solids and dissolved salts
	Direct and physicochemical measurements in wastewater (standard methods for the examination of water and wastewater) ³	Alkalinity, total chlorine, chlorides, electrical conductivity, DQO, DBO, total hardness, fats and oils, ammonia nitrogen, total Kjeldahl nitrogen, pH, solids and dissolved salts
	Standard test method for distillation of petroleum products at atmospheric pressure ³	Temperature
	Standard test method for flash point by closed cup Penskyn – Martens ³	Temperature
TEXTILE TESTS	Consumer Textiles ³	Weight, mass, dimensional

Proficiency Testing Programs for the Testing Area		
PT Scheme	Type of PT Items***	Properties Measured
BUILDING [Aggregates, Asphalt, Cement, Concrete, Geotechnics (Soils and Rocks), Asphalt Mixes]	Procedures for determining consistency limits, which include determining the liquid limit, plastic limit, and plasticity index in aggregates, asphalt, cement, asphalt mixes ³	Mass Consistency limits, which include determining the liquid limit, plastic limit, and plasticity index
	Fine material less than 0,080 mm (Determination by washing of the material that passes the sieve 75 µm (No. 200); organic impurities in fine aggregates ³	Mass
	Determination of the sand equivalent ³	Mass
BUILDING [Precast Elements]	Compression of precast concrete screeds (compressive strength of prepared soil-cement cylinders), traction ³	Force
BUILDING [Asphalt and Asphalt Mixtures]	Bitumen content in asphalt mixtures and granulometric analysis ³	Mass

Proficiency Testing Programs for Inspection Bodies		
PT Scheme	Type of PT Items***	Properties Measured
INSPECTION FOR INSPECTORS**	Inspections of installation of natural gas, electrical and lighting conditions illumination for residential and commercial buildings, gas exploration facilities, and service stations. Buildings with known characteristics ¹	Room volume measurement and inspection observations, selected quantitative measurements and related qualitative inspection observations lighting, lighting levels, reflection, reflection factor, voltage, electric current and resistance
	Exhaust emissions from vehicles using diesel fuel or gas ¹	Selected quantitative measurements and related qualitative inspection observations

* Assigned values for all property values are reference values that are metrologically traceable, where possible, to the International System of Units (SI) or other reference standards.

** Expected results for inspection observations are determined by the subcontractor.

*** PT Scheme design indicated by one or more of the following models of participation:

1. Participants come to a central location for calibration or measurement of a single device or item, or for inspection of an installation.
2. A single artefact or device is distributed sequentially to participants.
3. Identical PT items are distributed to participants simultaneously.



Accredited Proficiency Testing Provider

A2LA has accredited

METROLOGOS ESPECIALIZADOS E INGENIEROS ELÉCTRICOS MEIE S. DE R.L. DE C.V.

Ciudad de México, MEXICO

This accreditation covers the specific proficiency testing schemes listed on the agreed upon Scope of Accreditation.

This provider is accredited in accordance with the recognized International Standard ISO/IEC 17043: 2023
Conformity assessment - General requirements for proficiency testing. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.



Presented this 16th day of August 2022

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4853.01
Valid to June 30, 2026
Revised June 18, 2024

For the proficiency testing schemes to which this accreditation applies, please refer to the provider's Scope of Accreditation.