



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Qualabor Serviços da Qualidade Ltda.

**Rua Deputado Heitor Alencar Furtado, 5000
Curitiba, PR, 81280-340**

Fulfills the requirements of

ISO/IEC 17043:2010

In the field of

PROFICIENCY TESTING PROVIDER

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to be 'J. Stine', is positioned above a horizontal line.

Jason Stine, Vice President

Expiry Date: 30 January 2025

Certificate Number: AP-2654



This proficiency testing provider is accredited in accordance with the recognized International Standard ISO/IEC 17043:2010.
This accreditation demonstrates technical competence for a defined scope and the operation of a proficiency testing provider quality management system.

SCOPE OF ACCREDITATION TO ISO/IEC 17043:2010

Qualabor Serviços da Qualidade Ltda.

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PROFICIENCY TEST PROVIDER

Valid to: **January 30, 2025**

Certificate Number: **AP-2654**

Mechanical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|---|---|
| Insulation and creepage distance on electrical devices (ICD) | Dimensional quota of creepage and insulation | Consensus values from participants / Reference values |
| Shore, Barcol, Rockwell, Brinell, and Vickers hardness of materials (SHD, BHD, RHD, HBW, HDV) | Hardness | Consensus values from participants / Reference values |
| Spring mattress (SMT) | Scrolling; Indentation; Spring type; N° of springs; Perimeter edge width; Quilting thickness; Stew and foam thickness; Foam nominal density; Stew nominal density; Wire gauge; Edge density; Deformation of the edge; Edge resilience; Ash content of the border; Mattress width, Mattress length; Mattress height; | Consensus values from participants / Reference values |
| Flexible foam (FPF) | Density; Resilience; Permanent deformation due compression; Ash content; Indentation force; Dynamic fatigue – thickness loss; Dynamic fatigue – indentation force loss | Consensus values from participants / Reference values |
| Torsion, traction, compression, shear, flexion, folding in toys, party supplies and school supplies or other devices specific testing item (TEC, TTY) | Rupture, force, others | Consensus values from participants / Reference values |
| Indelibility of markings marked testing item (IMR) | Verify if marking is still readable | Consensus values from participants / Reference values |

Mechanical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|--|---|---|
| Plugs, sockets, outlets and other types of devices (SOD) | Linear measure, radius and angles | Consensus values from participants / Reference values |
| Pendulum impact specific testing item (PIT) | Failure of the item | Consensus values from participants / Reference values |
| Hammer impact specific testing item (HIT) | Failure of the item | Consensus values from participants / Reference values |
| Torque in screws of electrical connection testing item (TSC) | Failure of the item for a predetermined torque or the torque that has failed | Consensus values from participants / Reference values |
| IP index protection specific electrical device (IPL, IPS) | Index protection rating | Consensus values from participants / Reference values |
| Dye penetrant liquid, X-Ray, Ultrasonic and Magnetic Particles (DPL) | Welding failures | Consensus values from participants / Reference values |
| Ultrasonic thickness measurement (UTM) | Thickness | Consensus values from participants / Reference values |
| Pressure and vacuum valve (PVV) | Opening pressure | Consensus values from participants / Reference values |
| Headlight test (HDL) | Distance “e” | Consensus values from participants / Reference values |
| Breaking, suspension and Alignment (BSA) | Maximum force, unbalance index, imbalance of steering wheel. | Consensus values from participants / Reference values |
| Compressed natural gas (CNG) | Systems and components of road vehicles Components of CNG systems | Consensus values from participants / Reference values |
| Gas network inspection (GNI) | Internal network distribution Gas device Gas device connections Individual natural exhaust system Verification of combustion hygiene Collective network distribution Collective Individual natural exhaust system | Consensus values from participants / Reference values |

Biological Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|--|---|
| Equine infectious anemia blood serum samples (EIA) | Presence or absence of antibodies against equine infectious anemia virus | Reference values |
| Glanders blood serum samples (GLD) | Presence or absence of antibodies against glanders bacteria | Reference values |
| Detection of salmonella on food or water samples (SAD) | Presence or absence of salmonella | Consensus values from participants / Reference values |
| DNA Identification (Animal, Vegetable, Human, Forensic) (DNA) | Allele Identification | Reference values |
| Bovine brucellosis samples (BBI) | Presence or absence of antibodies against Brucella bacteria | Reference values |

Thermal Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|---|---|
| Needle flame on electrical device (NFL) | Flammability conditions | Consensus values from participants / Reference values |
| Glow-wire on electrical device (GLW) | Flammability conditions | Consensus values from participants / Reference values |
| Differential scanning calorimeter (DSC) polymer item or other items (DSC) | Glass temperature, Melt temperature, Crystallization temperature, Enthalpy of crystallization, Enthalpy of crystalline fusion | Consensus values from participants / Reference values |
| Flammability in devices (FTY) | Flammability conditions | Consensus values from participants / Reference values |
| Ball pressure specific testing item (BAP) | Print diameter | Consensus values from participants / Reference values |
| Temperature rise in terminals electrical device (TRT) | Temperature rise | Consensus values from participants / Reference values |
| Temperature rise in surfaces electrical device (TRS) | Temperature rise | Consensus values from participants / Reference values |

Electrical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|--|---|
| Short circuit electrical device (SHC) | Joule's integral, amplitude, current, and time | Consensus values from participants / Reference values |
| Dielectric strength in toys electrical device (DST) | Rupture of insulation | Consensus values from participants / Reference values |
| Insulation, grounding and other resistances in electrical devices (GNC, INR) | Resistance | Consensus values from participants / Reference values |
| Dielectric strength – applied tension electric device (DSA) | Disruptive voltage | Consensus values from participants / Reference values |
| Energies, powers, current, voltage, power factor, frequency in electrical devices (PCA) | Energies, powers, voltage, power factor, frequency and current | Consensus values from participants / Reference values |
| Circuit breakers, fuses or other equipment (CBT) | Time and circuit breaker action | Consensus values from participants / Reference values |

Chemical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|--|---|
| Atmospheric emissions from stationary sources and other sources (ATE) | Concentration of: CO(g) O ₂ (g) NO _x (g) SO _x (g) Particulate matter Others | Consensus values from participants / Reference values |
| Migration of heavy metals (DMS) | Concentration of: Sb As Ba Cd Cr Pb Hg Se Other metals | Consensus values from participants / Reference values |

Chemical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|--|---|---|
| Chemical-Physical Mineral oil for Electrical Insulation (CPI) | Index of neutralization Water content Density at 20/4°C Power factor at 100°C Dielectric strength Interfacial tension Color determination – colorimeter method Particle content Flash point Kinematic viscosity 40°C | Consensus values from participants / Reference values |
| PCB in liquids, solids and oils (PCB) | PCB concentration | Consensus values from participants / Reference values |
| Analysis of gases dissolved in electrical insulation oil by gas chromatography (DGC) | Hydrogen Oxygen Nitrogen Methane Ethane Ethylene Acetylene Carbon monoxide Carbon dioxide Total of gases Total combustible gases | Consensus values from participants / Reference values |
| Field chemical-physical tests in raw water, treated, residual, water for consumption or effluent (CPW) | Chemical-Physical tests | Consensus values from participants / Reference values |



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Chemical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|--|--|
| <p>Samples of Raw water, treated, residual, water for consumption or effluent testing (WTT)</p> | <p>Apparent Color True Color pH Turbidity Iron Fluorine Chlorine Manganese Chromium Copper Lead Magnesium Arsenic Antimony Zinc Sodium Selenium Aluminum Mercury Barium Tin Molybdenum</p> | <p>Consensus values from participants / Reference values</p> |
| <p>Samples of Raw water, treated, residual, water for consumption or effluent testing (WTT)</p> | <p>Silver Nickel Titanium Vanadium Calcium Cobalt Other metals Hardness Sulfate Sulfide Chloride</p> | <p>Consensus values from participants / Reference values</p> |

Chemical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|--|--|
| <p>Samples of Raw water, treated, residual, water for consumption or effluent testing (WTT)</p> | <p>Alkalinity Cyanide Hexavalent chromium BOD COD Phenol Ammoniac Nitrogen Nitrate Nitrite Total phosphorus Suspended solids Dissolved solids Oils and greases Calcium hardness Pesticides VOC TPH Organic solvents Trihalomethanes Drugs Hormones Pathogens Bacteria others</p> | <p>Consensus values from participants / Reference values</p> |
| <p>Vehicular emissions (EVE)</p> | <p>Concentration of: Carbon monoxide Hydrocarbons Nitrogen Oxides Sulfur Oxides Particulates matter Aldehydes Ketones Unburned ethanol</p> | <p>Consensus values from participants / Reference values</p> |
| <p>Mineral coal samples (MCO)</p> | <p>Hygroscopic moisture Volatile material Fixed carbon Superior calorific value Ashes Total sulfur</p> | <p>Consensus values from participants / Reference values</p> |

Chemical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|---|---|
| Automotive batteries (ABT, CAB, DAB) | Water tightness Capacity C20 Vibration resistance Electrolyte retention Dimensional inspection External Visual Inspection Weight Fall Capacity reservation Low temperature electric discharge Durability tests Suitable for flotation Voltage drop in the interconnections Internal resistance Thermal cycling test | Consensus values from participants / Reference values |
| APH (aromatic polycyclic hydrocarbons) in water, soil and sediments (APH) | Naphthalene Acenaphthalene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Criseno Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo (a) pyrene Indene (1,2,3-cd) pyrene Dibenzo (a, h) anthracene Benzo (g, h, i) perylene | Consensus values from participants / Reference values |

Acoustic Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|---|---------------------|---|
| Sound pressure level in devices and environment (SPT) | Sound pressure peak | Consensus values from participants / Reference values |
| Automotive noise (Exhaust system or in another point) (EAN) | Sound pressure peak | Consensus values from participants / Reference values |

Clinical Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|--|---|---|
| Hematology external quality control in blood serum samples (HQC) | Biochemistry Hematology: Automated hematology: Coagulation: Urinalysis: Parasitology: GRAM Bacterioscopies Bacteriology: Immunohematology | Consensus values from participants / Reference values |

Sampling Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|--|-----------------------------------|---|
| Isolated sampling process in raw water, treated, residual, water for consumption or effluent and air, soil, residue for chemical tests (SWC) | Sampling on chemical parameters | Consensus values from participants / Reference values |
| Isolated sampling process in raw water, treated, residual, water for consumption or effluent and air, soil, residue for physical tests (SWP) | Sampling on physical parameters | Consensus values from participants / Reference values |
| Isolated sampling process in raw water, treated, residual, water for consumption or effluent and air, soil, residue for biological tests (SWB) | Sampling on biological parameters | Consensus values from participants / Reference values |

Weight and Mass Calibration

| Description of PT Items/Artifact | Properties Measured | Range of Property | Expanded Uncertainty of PT Item / Artifact | Procedure for Establishing Assigned Value |
|---|---------------------|----------------------|--|--|
| Microbalance/Analytical/Precision Balance (Semi Analytical) or others similar equipment | Mass | 0,6 [mg] to 5,1 [kg] | 0,00415 [mg] to 6,4 [mg] | Certified Reference Value / Consensus values from participants |
| Balance or others similar equipment | Mass | 1 [kg] to 10000 [kg] | 600 [mg] to 300 [g] | Certified Reference Value / Consensus values from participants |
| Standard weight or others similar equipment | Mass | 1 [mg] to 500 [kg] | 0,002 [mg] to 25 [g] | Certified Reference Value / Consensus values from participants |

Dimensional Calibration

| Description of PT Items/Artifact | Properties Measured | Range of Property | Expanded Uncertainty of PT Item / Artifact | Procedure for Establishing Assigned Value |
|---|------------------------------|---------------------|--|--|
| Micrometer or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 500 [mm] | 1 [μm] to 8 [μm] | Certified Reference Value / Consensus values from participants |
| Dial Indicator or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 100 [mm] | 0,015 [mm] to 0,05 [mm] | Certified Reference Value / Consensus values from participants |
| Thickness Gauge or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 20 [mm] | 5 [μm] to 0,02 [mm] | Certified Reference Value / Consensus values from participants |
| Caliper or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 1500 [mm] | 0,02 [mm] to 0,12 [mm] | Certified Reference Value / Consensus values from participants |



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|--|------------------------------|---------------------|------------------------|--|
| Measuring tape or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 60 [m] | 0,6 [mm] to 12 [mm] | Certified Reference Value / Consensus values from participants |
| Height tracer or others similar equipment | Dimensional (Linear measure) | 0 [mm] to 1000 [mm] | 0,02 [mm] to 0,06 [mm] | Certified Reference Value / Consensus values from participants |
| Bore Gage Diameter Measurement or others similar equipment | Dimensional (Linear measure) | 18 [mm] to 400 [mm] | 10 [μm] to 13 [μm] | Certified Reference Value / Consensus values from participants |
| Goniometer or others similar equipment | Angle | 0 [°] to 360 [°] | ±0.07 [°] | Certified Reference Value / Consensus values from participants |

Volumetric Calibration

| Description of PT Items/Artifact | Properties Measured | Range of Property | Expanded Uncertainty of PT Item / Artifact | Procedure for Establishing Assigned Value |
|--|---------------------|----------------------|--|--|
| Micropipettes/pipettes or others similar equipment from microvolume and volume | Volume | 0,1 [μL] to 200 [mL] | 0,02 [μL] to 0,2 [mL] | Certified Reference Value / Consensus values from participants |
| Volumetric flask or other similar volumetric equipment | Volume | 1 [mL] to 10000 [mL] | 0,025 [mL] to 2 [mL] | Certified Reference Value / Consensus values from participants |

Thermal Calibration

| Description of PT Items/Artifact | Properties Measured | Range of Property | Expanded Uncertainty of PT Item / Artifact | Procedure for Establishing Assigned Value |
|---|---------------------|--------------------------|--|--|
| Temperature indicator with thermocouple or others similar equipment | Temperature | -196 [°C] to 1200 [°C] | [0,05% + 0,3°C] to [0,50% + 0,3°C] | Certified Reference Value / Consensus values from participants |
| Temperature indicator for thermocouple or others similar equipment | Temperature | -196 [°C] to 1200 [°C] | [0,05% + 0,3°C] to [0,50% + 0,3°C] | Certified Reference Value / Consensus values from participants |
| Thermocouple or others similar equipment | Temperature | -196 [°C] to 1200 [°C] | [0,05% + 0,3°C] to [0,50% + 0,3°C] | Certified Reference Value / Consensus values from participants |
| Temperature indicator with thermoresistance or others similar equipment | Temperature | -196 [°C] to 850 [°C] | 0,03 [°C] to 0,30 [°C] | Certified Reference Value / Consensus values from participants |
| Temperature indicator for thermoresistance or others similar equipment | Temperature | -196 [°C] to 850 [°C] | 0,03 [°C] to 0,30 [°C] | Certified Reference Value / Consensus values from participants |
| Thermoresistance or others similar equipment | Temperature | -196 [°C] to 850 [°C] | 0,03 [°C] to 0,30 [°C] | Certified Reference Value / Consensus values from participants |
| Infrared thermometer or others similar equipment | Temperature | -50 [°C] to 1 1 000 [°C] | -50 to 20[°C] ±3°C, 20[°C] to 500[°C] ±1,0%, ±1,0[°C], 500[°C] to 1200[°C] ±1,5% | Certified Reference Value / Consensus values from participants |
| Glass Thermometer or others similar equipment | Temperature | -30 [°C] to 300 [°C] | 0,2 [°C] to 2 [°C] | Certified Reference Value / Consensus values from participants |

Electrical Calibration

| Description of PT Items/Artifact | Properties Measured | Range of Property | Expanded Uncertainty of PT Item / Artifact | Procedure for Establishing Assigned Value |
|---|---------------------|---|---|--|
| Ohmmeter or others similar equipment | Resistance | 0,1 [$\mu\Omega$] to 500 [M Ω] | 0,001 [$\mu\Omega$] to 0,25 [M Ω] | Certified Reference Value / Consensus values from participants |
| Megohmmeter or others similar equipment | Resistance | 500 [M Ω] to 10 [T Ω] | 25 [M Ω] to 0,3 [T Ω] | Certified Reference Value / Consensus values from participants |
| Voltmeter or others similar equipment (AC) | Voltage | 50 [mV] to 1000 [V] (20 [Hz] to 100 [kHz]) | 0,02 [mV] to 4 [V] | Certified Reference Value / Consensus values from participants |
| Voltmeter or others similar equipment (DC) | Voltage | 50 [mV] to 1000 [V] | 0,015 [mV] to 0,3 [V] | Certified Reference Value / Consensus values from participants |
| Ammeter or others similar equipment (AC) | Current | 0,5 [mA] to 2500 [A] (45 [Hz] to 500 [Hz]) | 0,00025 [mA] to 125 [A] | Certified Reference Value / Consensus values from participants |
| Ammeter or others similar equipment (DC) | Current | 0,5 [mA] to 1000 [A] | 0,0025 [mA] to 20 [A] | Certified Reference Value / Consensus values from participants |
| Frequency meter or others similar equipment | Frequency | 0,5 [Hz] to 21 [MHz] | 0,005 [Hz] to 2,856 [MHz] | Certified Reference Value / Consensus values from participants |
| Capacimeter or others similar equipment | Capacitance | 1 [pF] to 100 [mF] | 0,005 [pF] to 2,00 [mF] | Certified Reference Value / Consensus values from participants |
| Wattmeter or others similar equipment | Active Power | 15 [W] to 561 [kW] (50/60Hz) | 0,375 [W] to 14,025 [kW] | Certified Reference Value / Consensus values from participants |



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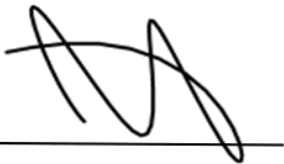
| | | | | |
|--|------------------------|------------------------------------|------------------------------------|--|
| Varmeter or others similar equipment | Reactive Power | 15 [Var] to 480 [kVar] (50/60Hz) | 0,375 [Var] to 12 [kVar] | Certified Reference Value / Consensus values from participants |
| Power Meter or others similar equipment | Apparent Power | 15 [VA] to 561 [kVA] (50/60Hz) | 0,375 [VA] to 14,025 [kVA] | Certified Reference Value / Consensus values from participants |
| Energy Meter or others similar equipment | Active Energy | 15 [Wh] to 561 [kWh] (50/60Hz) | 0,375 [Wh] to 14,025 [kWh] | Certified Reference Value / Consensus values from participants |
| Energy Meter or others similar equipment | Reactive Energy | 15 [Varh] to 480 [kVarh] (50/60Hz) | 0,375 [Var] to 12 [kVar] | Certified Reference Value / Consensus values from participants |
| Energy Meter or others similar equipment | Apparent Energy | 15 [VAh] to 561 [kVAh] (50/60Hz) | 0,375 [VA] to 14,025 [kVA] | Certified Reference Value / Consensus values from participants |
| Oscilloscope or others similar equipment | Gain (Vertical) | 1 [mV/Div] to 100 [V/Div] | 0,03 [mV/Div] to 4 [V/Div] | Certified Reference Value / Consensus values from participants |
| Oscilloscope or others similar equipment | Time Base (Horizontal) | 2,5 [ns/Div] - 1 [s/Div] | 0,00025 [ns/Div] to 0,0001 [s/Div] | Certified Reference Value / Consensus values from participants |

Classification Testing

| Description of Item | Properties Measured | Procedure for Establishing Assigned Value |
|--|---|--|
| Representative items or figures, pictures, or other representation (VIS) | Vehicular Classification or other classifications | Consensus values from participants / Reference values/Known Values |

Note:

1. This scope is formatted as part of a single document including Certificate of Accreditation No. AP-2654.



Jason Stine, Vice President

