

# Physicochemical Calibration



## What is Physicochemical Calibration?

Physicochemical calibration involves the precise calibration of instruments that measure various physical and chemical properties. At Applus+ Laboratories, we offer both on-site calibration and laboratory calibration services, adhering to the ISO 17025 standard, ensuring traceability and international compliance. Our physicochemical calibration services ensure accurate and reliable measurements for various applications, including industrial processes, environmental monitoring, and quality control.

## Types of Physicochemical Calibration

We offer calibration services for a wide range of physicochemical measurement instruments. These services are divided into several categories, each focused on specific measurement variables.

### Optical Calibration

We calibrate instruments that measure optical properties such as transmittance, absorption coefficient, wavelength, and optical density.

- **UV-VIS and IR Spectrophotometers:** Used to measure the absorbance and transmittance of light at different wavelengths, essential in chemical and biological analysis.
- **Standard Opacity Filters:** Used to calibrate devices that measure the opacity of emitted gases.
- **Optical Density Filters:** Used in the calibration of instruments measuring the optical density of samples.

- **Opacimeters:** Devices that measure the opacity of diesel vehicle smoke, ensuring emissions are within legal limits.

## Density and Viscosity Calibration

We calibrate devices that measure the density and viscosity of liquids, ensuring precise control in various industrial processes.

- **Capillary, Flow Cup, and Rotational Viscometers:** Used to measure the dynamic and kinematic viscosity of liquids for the petrochemical and food industries, among others.
- **Hydrometers:** Instruments for measuring the density of liquids based on the principle of buoyancy.
- **Oscillating Tube Densimeters and Alcoholmeters:** Used for the precise measurement of liquid density, including alcoholic beverages.
- **Pycnometers:** High-precision devices for measuring the density of liquids and solids.

## Flow Calibration

We offer calibration for instruments measuring the flow rate of gases and liquids, ensuring accurate readings essential for process control and environmental monitoring.

- **Gas Flowmeters:** Include direct measurement devices and mass flow controllers for industrial and environmental applications.
- **Sampling Pumps and Pump Calibrators:** Used to measure and calibrate the gas flow rate in air quality studies.
- **Rotameters:** Instruments that measure the flow rate of liquids and gases using the principle of buoyancy.

## Volume Calibration

Our calibration services for volume measurement instruments ensure accurate dispensing and measurement of liquids.

- **Volumetric Instruments (Glass or Plastic):** Burettes, fixed-volume pipettes, graduated pipettes, volumetric flasks, and graduated cylinders. Precise volumetric measuring tools with markings on the neck and base for visual volume determination.
- **Piston-operated Volumetric Apparatus:** Pipettes, micropipettes, diluters, dispensers, and syringes. Instruments used in laboratories for the precise measurement and transfer of liquid volumes.
- **Vessels and Flasks (Pre-wetted and Dry):** Instruments used by Authorised Metrological Verification Bodies for periodic checks or post-repair verification of fuel dispensers and AdBlue systems.

## Gas Calibration

We calibrate instruments that measure the concentration of various gases, ensuring compliance with environmental and safety regulations.

- **Exhaust Gas Analysers and Environmental Gas Detectors:** Used to measure the concentration of gases such as CO, CO<sub>2</sub>, NO, SH<sub>2</sub>, in industrial and automotive emissions.
- **Explosimeters and Air Oxygen Meters:** Safety instruments for measuring explosive gas concentrations and oxygen levels in work environments, CH<sub>4</sub> and O<sub>2</sub>.

## Physicochemical Calibration

We offer calibration services for instruments that measure pH, conductivity, refractometers, turbidity meters, and other physicochemical properties.

- **pH Meters:** Used to determine the acidity or alkalinity of solutions in industries such as food and pharmaceuticals.
- **Conductivity Meters:** Instruments for measuring the electrical conductivity of solutions, used in industrial and water treatment applications.

## Velocity

Calibration services for gas analysis instruments ensure accurate monitoring of emissions and gas concentrations.

- **Anemometers:** Air velocity meters used in environmental and ventilation studies.

## How to Calibrate Physicochemical Calibration Instruments

To calibrate physicochemical measurement instruments, follow these steps:

- **Select an Accredited Laboratory:** Choose Applus+ Laboratories, accredited according to ISO 17025.
- **Send Instruments for Calibration:** Instruments can be sent to our laboratory, or our experts can perform on-site calibration.
- **Calibration Process:** We use traceable reference standards to test and adjust instruments, ensuring measurements align with recognised reference points.
- **Receive Calibration Certificate:** A detailed calibration certificate is issued, which in certain cases can confirm that the instrument meets the required standards.

## Benefits of Physicochemical Calibration

Calibrating physicochemical instruments offers numerous benefits:

- **Improved Accuracy:** Ensures precise measurements for critical processes.
- **Compliance:** Meets stringent ISO 17025 standards.
- **Reliability:** Increases the reliability of measurement data.
- **Traceability:** Provides documented traceability to national and international standards.
- **Cost Efficiency:** Prevents costly errors and penalties for non-compliance.

## Why Choose Applus+ Laboratories for Physicochemical Calibration?

Applus+ Laboratories offers several advantages for physicochemical calibration:

- **Accredited Expertise:** We are accredited by ENAC as a Calibration laboratory according to ISO/IEC 17025, with different scopes that can be consulted [here](#), guaranteeing high standards of accuracy and reliability.
- **Comprehensive Services:** Our calibration services cover a wide range of instruments and measurement variables.
- **Advanced Equipment:** We use state-of-the-art equipment for precise calibration.
- **Experienced Professionals:** Highly trained staff with extensive experience in physicochemical measurements.
- **Customised Solutions:** Services tailored to the specific needs of each client.
- **Quality Assurance:** Rigorous quality control and traceability in all calibration processes.