

# Mechanical Calibration

[Applus+ Laboratories](#) offers laboratory and [on-site calibration services](#) for mechanical magnitude measurement equipment (mass, force, torque, hardness, pressure).



We operate under the UNE-EN ISO/IEC 17025 standard, ensuring traceability to national or international standards and we are accredited by ENAC (member of ILAC).

## What is mechanical calibration?

Mechanical calibration guarantees the accuracy of technical equipment used to measure mechanical quantities, such as force or pressure.

## Differences between calibration and verification

Calibration aims to adjust and correct a measuring instrument so that it aligns with a reference standard, ensuring accuracy.

Verification, on the other hand, simply confirms whether the instrument provides accurate measurements within acceptable limits, without implementing further adjustments.

In other words, we use calibration to make the needed adjustments and verification to validate the accuracy of an instrument.

## Types of mechanical calibration

There are different types of mechanical calibration methods depending on the instrument or quantities that must be measured. We offer the following types of calibration:

- Mass calibration, mostly to weight instruments.
- Hardness calibration.
- Force and moment calibration.
- Pressure and vacuum calibration

## Mass calibration

Our industrial calibration scope for equipment to mass measurement equipment, includes:

### Weighing instruments

Weight measuring standards accurately materialise the exact quantity of mass that should be taken into account. The weighing equipment that we use on a daily basis in our everyday environment (commerce, health, trade...) is calibrated and adjusted based on these terms. In our laboratories, **we calibrate**:

- Class E2 or lower quality weights according to OIML R111 from 1 mg to 10 kg
- Class F1 or lower quality weights according to OIML R111 from 1 kg to 50 kg
- Class M1 or lower quality weights according to OIML R111 from 10 kg to 1000 kg
- Mass standards from 1 mg to 1000 kg

We also calibrate the following scales:

- Non-automatic weighing instruments (NAWI).
  - Single-pan laboratory scales, from 0.02 kg to 50,000 kg.
  - Single-pan balances, from 1 mg to 150000 kg on site.
  - Hoppers, reactors, silos and bins from 1 kg to 80,000 kg in the field.
- Automatic weighing instruments:
  - Automatic checkweighers up to 300 kg maximum.
  - Gravimetric filling instruments up to 5,000 kg.
  - Continuous totalisers up to 200 tonnes per hour.

## Force and torque calibration

We offer industrial calibration for various force and torque measuring equipment, including:

- Force measuring instruments such as transducers, dynamometers and similar types. Classes 0.5 or lower according to UNE-EN ISO 376 standard.

- Force measuring instruments such as transducers, dynamometers and similar types. Not classifiable according to standard UNE-EN ISO 376.
- Force measuring instruments Transducers, dynamometers and similar types. Class 00 or lower according to UNE-EN ISO 376 standard.
- Force measuring instruments Transducers, dynamometers and similar types. Not classifiable according to UNE-EN ISO 376 standard.
- Force measuring instruments and dynamometers that aren't classifiable according to the UNE-EN ISO 376 standard.
- Force measuring systems for static uniaxial testing machines classes 0,5 or lower according to the UNE-EN ISO 7500-1 standard.
- Force measuring systems for static uniaxial testing machines classes 0,5 or lower according to the UNE-EN ISO 7500-1 standard, class 1 or lower according to the UNE-EN 12390-4 norm.
- Force measuring systems for static uniaxial testing machines classes 1 or lower according to UNE-EN ISO 7500-1:2018 and UNE-EN 12390-4 standards
- Force measurement systems for non-classifiable static uniaxial machines
- Force measurement systems for static uniaxial testing machines according to the ASTM E4 standard.
- Strain gauges and uniaxial extensometers Classes 0,5, 1, and 2, according to the UNE-EN ISO 9513 standard.
- Displacement measuring instruments for uniaxial machines and test actuators of classes 0,5, 1, and 2, according to the UNE-EN ISO 9513 standard.
- Strain gauges and uniaxial extensometers classes B-1, B-2, C, D, and E according to the ASTM E83 standard.
- Displacement measuring devices according to the ISO 5893 standard.
- Type COD Linearity of strain-gauge displacement measuring devices according to ASTM E399 standards.
- Displacement measuring devices classes A, B, C, and D according to the ASTM E2309.
- Torque measuring instruments. Torque transducers.
- Torque tools (in both the clockwise and counterclockwise directions). Types and classes defined in the UNE-EN ISO 6789 standard, in situ and in the laboratory.
- Torque tools (dextrorotatory direction). Types and classes defined in the UNE-EN ISO 6789 standard, in situ.
- Full bridge electrical indicators at 225 Hz, 350  $\Omega$  and 5 V or 10 V.
- Full-bridge, 350  $\Omega$ , 5 V DC full-bridge electrical indicators.
- Static motorbike brake testers
- Light vehicle brake testers in static mode
- Universal and heavy vehicle brake testers in static mode

## **Pressure and vacuum calibration**

We offer industrial calibration for various pressure and vacuum measuring equipment:

- Pressure gauges, vacuum gauges and pneumatic absolute pressure transmitters in the laboratory from 0.5 kPa to 12 MPa in the laboratory.
- On-site pressure gauges, vacuum gauges and pneumatic absolute pressure transmitters from 0.5 kPa to 7 MPa in the laboratory.
- Laboratory Pneumatic Relative Pressure Gauges and Transmitters from -95 kPa to 12 MPa.
- In situ pneumatic relative pressure gauges and transmitters from -100 kPa to 2,5 MPa.
- Laboratory hydraulic relative pressure gauges and transmitters from 500 kPa to 260 MPa.
- In-situ hydraulic relative pressure gauges and transmitters from 0 to 260 MPa.
- Vacuum gauges.
- Pressure gauges.
- Pressure gauges.
- Barometers.

## How to calibrate instruments in mechanical calibration?

The first step to accredit mechanical calibration instruments is selecting an accredited calibration laboratory that meets ISO/IEC 17025 requirements, such as Applus+ Laboratories.

The instruments are then sent to the laboratory, where they undergo rigorous testing using traceable reference equipment. Calibration results are compared with recognised standards, and any deviations are corrected.

Finally, a detailed calibration certificate is issued, confirming that the instrument complies with the established standards.

This process ensures the quality and reliability of measurements, which is crucial to ensure the maximum accuracy of manufacturing, research and similar processes.

## Benefits of mechanical calibration

With accreditation in mechanical calibration you can:

- Ensure reliable and traceable results.
- Consistently guarantee the accuracy of the measurement equipment.
- Meet rigorous ISO/IEC 17025 standards.
- Ensure accurate and reliable measurements over time.

## Why choose Applus+ Laboratories for mechanical calibration?



Becoming accredited in mechanical calibration with Applus+ Laboratories offers a number of distinctive benefits:

- **Experience and recognition:** we have a solid track record and recognition in calibration services, backed by our expertise in the mechanical field.
- **The most advanced equipment:** we use state-of-the-art equipment to perform accurate and reliable calibrations, ensuring accurate and consistent results.
- Highly trained personnel.
- **Customised Services:** we offer solutions tailored to the specific needs of each customer, providing a personalised approach to calibration services.
- **Traceability and Quality Control:** we ensure the traceability of measurements and maintain rigorous quality controls to guarantee the reliability of the results.