

BASES OF THE METROLOGY



TIIAME

Metrology is the science of measurement and includes all theoretical and practical aspects of measurement.

Metrology is defined by the International Bureau of Weights and Measures as "the science of measurement, embracing both experimental and theoretical determinations at any level of uncertainty in any field of science and technology". The ontology and international vocabulary of metrology is maintained by the Joint Committee for Guides in Metrology, a group made up of eight international organisations - BIPM, IEC, IFCC, ISO, IUPAC, OIML and ILAC.



Metrology is a broad field divided into three basic, overlapping activities:

- Definition of internationally accepted units of measurement
- Realisation of these units of measurement in practice
- Application of chains of traceability linking measurements made in practice to reference standards

Metrology also has three basic subfields that all use the three basic activities to varying degrees:

- Scientific or fundamental metrology
- Applied, technical or industrial metrology
- Legal metrology



Scientific or fundamental metrology

Scientific and fundamental metrology concerns the establishment of quantity systems, unit systems, units of measurement, the development of new measurement methods, realization of measurement standards, and the transfer of traceability from these standards to users in society.



Applied, technical or industrial metrology

Applied, technical or industrial metrology concerns the application of measurement science to manufacturing and other processes and their use in society, ensuring the suitability of measurement instruments, their calibration and quality control of measurements.



Legal metrology

Legal metrology "concerns activities which result from statutory requirements and concern measurement, units of measurement, measuring instruments and methods of measurement and which are performed by competent bodies."



Performing a measurement means comparing an unknown physical (or chemical) quantity with a quantity of the same type taken as reference using an instrument. A measurement necessarily involves a reference frame and therefore units. In the not so distant past, there were numerous units, which had little in common with each other.

In 1960, during the eleventh *Conférence Générale des Poids et Mesures (CGPM)*, the International System of Units, the SI, was developed. It now includes two classes of units :

- The seven **base unites** ;
- The **derived units**.



The base units and their definitions

To date, the International System of Units, the SI, is made up of seven base units (between brackets the sole/single symbol representing it) :

- The metre (m)
- The kilogram (kg)
- The second (s)
- The ampere (A)
- The kelvin (K)
- The candela (cd)
- The mole (mol)



THANK YOU FOR YOUR
ATTENTION

