

Bureau international des
poids et mesures (BIPM)

International Bureau of
Weights and Measures (BIPM)

Mission, Role and Objectives



THE MISSION AND ROLE OF THE BIPM

The BIPM is an intergovernmental organization established by the Metre Convention, through which Member States act together on matters related to measurement science and measurement standards.

The mission of the BIPM is to ensure and promote the global comparability of measurements, including providing a coherent international system of units for:

- Scientific discovery and innovation,
- Industrial manufacturing and international trade,
- Sustaining the quality of life and the global environment.

The unique role of the BIPM is based on its international and impartial character enabling it:

- To coordinate the realization and improvement of the world-wide measurement system to ensure it delivers accurate and comparable measurement results.
- To undertake selected scientific and technical activities that are more efficiently carried out in its own laboratories on behalf of Member States.
- To promote the importance of metrology to science, industry and society, in particular through collaboration with other intergovernmental organizations and international bodies and in international forums.

The unique role of the BIPM enables it to achieve its mission by developing the technical and organizational infrastructure of the International System of Units (SI) as the basis for the world-wide traceability of measurement results. This is achieved both through technical activities in its laboratories and through international coordination.

THE OBJECTIVES OF THE BIPM

- To establish and maintain appropriate reference standards for use as the basis of a limited number of key international comparisons at the highest level.
- To coordinate international comparisons of national measurement standards through the Consultative Committees of the CIPM; taking the role of coordinating laboratory for selected comparisons of the highest priority and undertaking the scientific work necessary to enable this to be done.
- To provide selected calibrations for Member States.
- To coordinate activities between the NMIs of Member States, such as through the CIPM MRA¹, and to provide technical services to support them.
- To liaise as required with relevant intergovernmental organizations² and other international bodies³ both directly and through joint committees⁴.
- To organize scientific meetings to identify future developments in the world-wide measurement system required to meet existing and future measurement needs in industry, science and society.
- To inform, through publications and meetings, the science community, the wider scientific public and decision makers on matters related to metrology and its benefits.

¹ The CIPM Mutual Recognition Arrangement (CIPM MRA) is coordinated jointly by the BIPM and the Regional Metrology Organizations.

² Examples of intergovernmental organizations in liaison with the BIPM are: OIML, IAEA, WMO and WHO.

³ Examples of other international bodies in liaison with the BIPM are: ILAC and ISO.

⁴ Examples of joint committees are the Joint Committee on Guides on Metrology and the Joint Committee on Traceability in Laboratory Medicine.

BACKGROUND AND GOVERNANCE

Organizational structure and formal basis

The Metre Convention was signed in Paris on 20 May 1875 and has remained unchanged since 1921. It is the formal intergovernmental agreement through which Member States act together on matters related to measurement science and measurement standards.

The Metre Convention created a permanent and scientific International Bureau of Weights and Measures (BIPM), located at the Pavillon de Breteuil, Sèvres, in the outskirts of Paris together with an organizational structure for its governance. This comprises an International Committee for Weights and Measures (CIPM), charged with the exclusive direction and supervision of the BIPM, placed under the authority of a General Conference on Weights and Measures (CGPM) formed by delegates of the governments of all the Member States. The cost of operating the BIPM is voted at each General Conferences and distributed among the Member States according to an agreed scale. At the 21st CGPM in 1999 the category of Associate States and Economies of the CGPM was created, giving access to a limited set of advantages associated with a lower financial contribution.

General Conference on Weights and Measures (CGPM)

The CGPM meets in Paris typically once every four years and is composed of official delegations from Member States. It has overriding authority in all matters related to the activities carried out under the Metre Convention. The CGPM makes the important decisions related to metrology, notably those related to the SI and its development. Each CGPM examines and votes upon the BIPM's forthcoming work programme and budget, presented to it by the CIPM; it also elects or re-elects members of the CIPM.

The CGPM acts through Resolutions voted at each Conference. Draft Resolutions are proposed by the CIPM or by individual governments and are distributed to governments in advance so that delegates can be given appropriate instructions. Resolutions typically address wider matters of common interest to governments related to international metrology.

International Committee for Weights and Measures (CIPM)

The International Committee for Weights and Measures (CIPM) directs all metrological work that the Member States decide to execute in common. It is charged by the Convention with the exclusive direction and supervision of the BIPM.

The CIPM now has eighteen members, each being of a different nationality and elected by the CGPM. The CIPM appoints the Director of the BIPM. While not a member of the CIPM, the BIPM Director takes part in and has a vote at meetings of the CIPM. The text of the Convention requires the CIPM to meet at least every two years and it usually meets at least once per year.

The CIPM has created a number of Consultative Committees to advise it on matters related to individual areas of metrology (see below). The President of the CIPM presents a report to each General Conference on work accomplished since the last meeting.

Consultative Committees (CCs)

The CIPM has set up a number of Consultative Committees to advise it on matters related to various fields of metrology. The Consultative Committees are responsible for coordinating the international work carried out in their respective fields and for proposing recommendations to the CIPM concerning units.

At the time of writing the Consultative Committees are:

1. The Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV);
2. The Consultative Committee for Electricity and Magnetism (CEM);
3. The Consultative Committee for Length (CCL);
4. The Consultative Committee for Mass and Related Quantities (CCM);
5. The Consultative Committee for Photometry and Radiometry (CCPR);
6. The Consultative Committee for Amount of Substance: Metrology in Chemistry (CCQM);
7. The Consultative Committee for Ionizing Radiation (CCRI);
8. The Consultative Committee for Thermometry (CCT);
9. The Consultative Committee for Time and Frequency (CCTF);
10. The Consultative Committee for Units (CCU).

CIPM Mutual Recognition Arrangement (CIPM MRA) and the BIPM key comparison database (KCDB)

In 1999, at the time of the 21st CGPM, the CIPM established a Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by National Metrology Institutes. This is known as the CIPM MRA. It was formally sanctioned by Resolution 2 of the 21st CGPM, which in its Resolution 3 created the category of Associate State and Economy of the CGPM in order for developing States and those in transition to participate in the CIPM MRA. Directors of NMIs participating in the CIPM MRA agree to:

- accept the process specified in the CIPM MRA for establishing a database, which is maintained by the BIPM and publicly available on the Web;
- recognize the results of comparisons published in the database;
- recognize the calibration and measurement capabilities of other participating NMIs as stated in the database.

The BIPM key comparison database (KCDB) is managed by the BIPM and is openly available on the Web. It constitutes the technical basis for the CIPM MRA, giving access to the list of participating laboratories, and including the results of international comparisons, once interpreted in terms of equivalence, and also the approved Calibration and Measurement Capabilities (CMCs).

THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES AT THE PAVILLON DE BRETEUIL

The laboratories and offices of the BIPM are at the Pavillon de Breteuil located in the Domaine National du Parc de Saint Cloud in the outskirts of Paris. This site was offered to the CIPM by the French Government at the time of the signing of the Metre Convention. The BIPM is accorded the privileges and immunities necessary to fulfil its mission as an intergovernmental organization located in France through an agreement between the French Government and the CIPM. Over the years a number of additional buildings have been erected on the site to meet changing needs.

The current work programme includes laboratory work in the fields of mass, time, electricity, ionizing radiation and chemistry. The work programme is agreed by the CGPM as a function of international needs and priorities, with the common characteristic of all projects being that if they were not carried out at the BIPM they would have to be carried out at one or more NMIs for the benefit of all.