

IMEKO - THE INSTRUMENTATION AND MEASUREMENT CONFEDERATION

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Abstract: This communication will deal shortly with the objectives of IMEKO, the Instrumentation and Measurement Confederation, will inform on its structure, will highlight its publications and will present an overview on the activities of the 24 IMEKO Technical Committees.

Keywords: IMEKO.

1. INTRODUCTION

IMEKO is a non-governmental federation of 36 national Member Organizations, table 1.

The Member Organisations are scientific/technical societies or committees. They include representatives of metrological institutions, higher education institutions, industry and users of instruments.

This communication will present the objectives of the Confederation, will describe its structure and will present an overview on the activities of the Technical Committees.

The fundamental objectives of IMEKO are: (i) the promotion of international interchange of scientific and technical information in the field of measurement and instrumentation; (ii) the enhancement of international co-operation among scientists and engineers from research and industry.

From the defined general principles IMEKO can be regarded as a global network, a forum where instrument makers, users, research and development experts, legal metrology scientists and university professors meet and exchange ideas.

IMEKO's responsibility is to consider the challenges of measurement science and technology coming from important application areas and to form visions for the future development of human society.

Table 1. The 36 IMEKO country Members.

Albania	Egypt	Kenya	Slovakia
Austria	Finland	Korea (Rep. of)	Slovenia
Belgium	France	Mexico	South Africa
Brazil	Germany	Netherlands	Spain
Bulgaria	Greece	Nigeria	Sweden
Canada	Hungary	Poland	Switzerland
China	Israel	Portugal	Thailand
Croatia	Italy	Romania	Turkey
Czech	Japan	Russia	United

Republic			Kingdom
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The permanent organs of IMEKO are the General Council, the Secretariat, the Advisory Board, the Technical Board, the Drafting Committee and the Credentials and Membership Committee, see fig. 1.

The General Council (GC) is the supreme governing body of IMEKO. It includes one or two delegates from each Member Organization and holds yearly Sessions.

The Secretariat is the executive body headed by the Secretary General. It carries out the decisions of the GC.

The Advisory Board is to formulate proposals on the policy and strategy of IMEKO, chaired by the Immediate Past President.

The task of the Technical Board is to analyse and support the activities of the Technical Committees.

The activities of IMEKO are basically carried out through the Technical Committees to realize the objectives set out in the Constitution and By-Laws.

The 24 Technical Committees do organize symposia, conferences, workshops, seminars on specific topics at regular intervals, publish proceedings of events, text-books, glossaries, studies, etc.

Every three years, IMEKO organizes a World Congress. These are the gathering of scientists and engineers in order to discuss selected papers and reports and to exchange experiences in accordance with the general aims of IMEKO. In all other years IMEKO TCs organize about ten Symposium and Workshops.

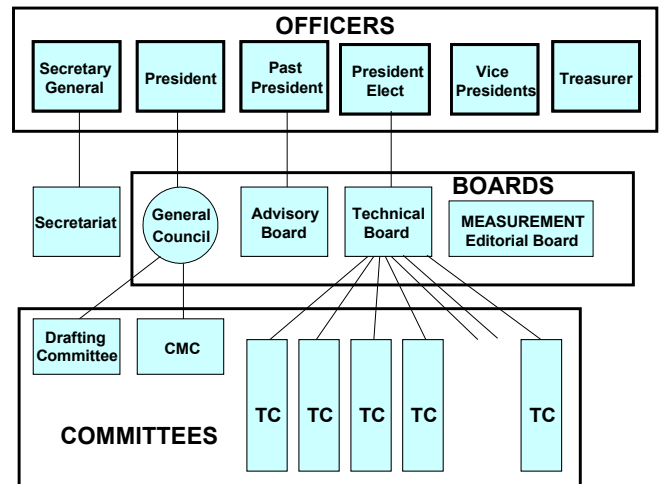


Fig. 1. IMEKO structure.
Table 2. The 24 IMEKO Technical Committees.

TC	Name
TC1	- Education and Training in Measurement and Instrumentation
TC2	- Photonics
TC3	- Measurement of Force, Mass and Torque
TC4	- Measurement of Electrical Quantities
TC5	- Hardness Measurement
TC6	- Vocabulary Committee
TC7	- Measurement Science
TC8	- Traceability in Metrology
TC9	- Flow Measurement
TC10	- Technical Diagnostics
TC11	- Metrological Infrastructures
TC12	- Temperature and Thermal Measurements
TC13	- Measurements in Biology and Medicine
TC14	- Measurement of Geometrical Quantities
TC15	- Experimental Mechanics
TC16	- Pressure and Vacuum Measurement
TC17	- Measurement in Robotics
TC18	- Measurement of Human Functions
TC19	- Environmental Measurements
TC20	- Measurement Techniques for the Construction Industry
TC21	- Mathematical Tools for Measurements
TC22	- Vibration Measurement
TC23	- Metrology in Food and Nutrition
TC 24	- Chemical Measurements

A list of all TCs is shown in table2.

TC1 provides a forum for discussions on all kind of educational aspects of measurement science and instrumentation, dissemination of concepts for real and virtual tools for training in measurement and instrumentation, exchange of ideas on globalisation and the use of internet for the further development of education in measurement.

The aim of TC2 is to study the application of photon detectors for conversion of optical images to electrical signals and conversion of optical images to optical images, via the spectral transposition in measurement technology for instance in photometry, radiometry, optoelectronics, optical communication, or astronomy.

The objective of TC3 is to bring to the forefront the latest developments and achievements in the measurement of force, mass, torque and density. The scope of TC3 covers all areas from industrial applications and new transducers to improvements of the scales for the different quantities, the realization of new standards and fundamental research.

TC4 deals with electrical measurements in the broad sense, i.e. including both power and HF measurement which are of vital importance in various fields of science and technology.

The aim of TC5 is to disseminate new theoretical knowledge in the field of hardness testing and also recently developed equipment to solve outstanding problems in the field.

The objectives of TC7 are to promote measurement theory on international scale. The aim is to help increasing efficiency in research, by allowing easier solution of problems as a result of a deeper understanding; in education, by rationalization of teaching as a result of a objective generalization; in production, by easier quality control as a result of greater repeatability .

The objectives of TC8 are to investigate (i) fundamental criteria and technical aspects of traceability in metrology; (ii) rules of calibration in chain systems; (iii) reliability and limits of traceability schemes.

The goals of TC8 are to organize symposia, colloquia, training courses on timely topics of metrological traceability for physical quantities.

The objectives of TC9 are to promote International exchange of information and organization of Conferences on Fluid Flow Measurement through closed pipes, covering gases, liquids, and mixtures of these, with emphasis on industrially relevant research activities.

The objectives of TC10 are to facilitate the exchange of scientific and technical information on diagnostic methods, instrumentation and systems, support co-operation between scientists and engineers in different subject areas in solving various diagnostic problems, to bring attention to the basic principles and development trends in diagnostic work and the co-ordination of the solution of fundamental problems and to seek unified diagnostic methods and components of diagnostic systems.

The objective of TC11 is to collect, discuss and disseminate know-how about development, establishment and operation of institutions and services concerned with measurement standards, measuring instruments, calibration, metrological assurance, certification and accreditation, taking into account the specific economic, social and educational needs of individual countries with special emphasis on developing countries.

TC12 provides forum for an international exchange of opinions among experts in the field of temperature and thermal measurements. Attention is paid to sensors, to new measurement methods and to the use of electronics and microcomputers in temperature and thermal measurement and control systems. Emphasis is given to the improvement of efficiency in industrial applications.

TC13 focuses on measurement of whole body, organ and cellular function, invasive and non-invasive measurements, sensing and measurement of physical variables, electrical measurement, chemical and nuclear sensing and measurement, measurement at the bedside in the critical care unit and measurement in the clinical laboratory.

The aim of TC14 is to promote in theory, fundamental research and application the development of measurement technologies for product-inspection, process-control and quality management.

TC15 focuses on static, dynamic and stability problems in experimental mechanics, problems of geometric and physical non-linearity like time-depending response of materials and structures, the effects of elastic-plastic, visco-elastic and visco-plastic as well as of inhomogeneous and non-isotropic response of materials, the phenomena of fracture and fatigue and the effects of impact loading, wave

propagation, experimentally, as well as measurements in modal analysis and systems identification.

The objectives of TC16 are to organize symposia, workshops and round table sessions on pressure measuring techniques, application, sensor design and calibration

TC17 main objectives are to deal with all aspects relevant to robot sensors, both internal and external ones like force, tactile, distance, visual and others, employed in robot motion and navigation control-principle, methodology and applications, communication sensors interfacing man and robot.

TC18 provides the opportunity and forum for discussing all aspects relevant to Measurement, Analysis and Modeling of Human Functions, Movement, Perception and Cognition.

TC19 provides an international platform for collaborating in the field of environmental measurements.

TC20 Scopes of monitoring deformation and force measurement, concentration of chemical species as moisture, chloride, pH, corrosion. The aim of TC20 is to improve sensor development and monitoring strategies and to build an interface between metrology and civil engineering.

TC21 aims to promote the harmonization, the coordinated use and the development of new mathematical and statistical tools for measurements, and their implementation in guides, procedures and codes, acting as a portal on an international environment.

The target of TC22 is to establish an international non-governmental forum for vibration and shock metrologists. It will be mainly concerned with the measurement and metrology of the dynamic quantities displacement, velocity and acceleration as well as with the corresponding dynamic angular units.

IMEKO approved in 2006 a new Technical Committee, TC23, on Metrology in Food and Nutrition Measurements. This is an important milestone for strengthening the reliability of F&N measurements at international level.

During the 2007 GC and TB meetings in Paris, it was approved the creation of TC 24. It intends to provide an international forum of effective collaboration in analytical chemistry, aiming to improve the reliability, comparability and traceability of chemical measurements in a large numbers of sectors, addressing industrial needs, field laboratories and on site measurements. Collaborative efforts will mainly involve the metrology community, field and sectoral laboratories (testing, analytical and industrial), proficiency testing providers, producers of reference materials.

The next World Congress will be held in September 2009, in Lisbon, Portugal. We invite you all to participate and make this event a great success.

IMEKO's website URL is www.imeko.org.