

EURAMET

European Association of National Metrology Institutes

Welcome to our new EURAMET Newsletter

By EURAMET Chairman



Change of EURAMET Chair: Leslie Pendrill (left) presents EURAMET ceremonial gauge block to his predecessor Prof Michael Kühne

First call of major European Metrology Research Programme and creation of Focus Group in support of Metrological Infrastructures: two responsibilities recently taken on and spanning the full range of EURAMET's activities – from advancing scientific excellence to increasing metrology capacity across the European Union and associated states, explains new EURAMET Chairperson, Leslie Pendrill.

Regional metrology organisations such as EURAMET [www.euramet.org] are arenas for cooperation in National Metrology. Cooperation amongst national metrology institutes and designated institutes is necessary in all their fields of activity – from metrological research to the provision of calibration services – in response to increased needs of society for traceable measurement. Such needs arise in not only traditional areas (trade, manufacturing, etc) but also in meeting some of the 'Grand Challenges' of modern society, such as energy & the environment; health; security etc, often in combination with the enabling technologies (such as nanotechnology and biotechnology).

In this edition of the EURAMET Newsletter, the reader will find several examples of our organisation's activities which together make a balanced programme of cooperation across four fields of activity:

- A) Traceability of measurements to SI
- B) International recognition of national metrology
- C) Knowledge exchange & infrastructural support in metrology
- D) Research in metrology

Significant progress includes, the creation of a focus group for infrastructural support in metrology and the implementation of a major European Metrology Research Programme (EMRP). Alongside these high profile events, this Newsletter also highlights other important EURAMET activities:

International recognition of national measurement standards and of the Calibration and Measurement Capabilities (CMC) of members of the EURAMET organisation which in recent years has expanded to encompass currently over 100 member organisations and associates from 37 European countries.

EURAMET is actively strengthening its liaisons with major stakeholder groups. This includes other European organisations active in measurement, testing, accreditation and conformity assessment. Both WELMEC and EURACHEM have recently become Liaison Organisations with EURAMET, and EA European Accreditation is an important partner, amongst others.

The new EURAMET Chairperson, Leslie Pendrill, is from the Swedish national metrology institute, hosted by SP Technical Research Institute of Sweden. The previous Chair – Prof Michael Kühne of the German national metrology institute Physikalisch-Technische Bundesanstalt (Photo) – has now moved to the Bureau International des Poids et Mesures (BIPM) in Sevres (France) where he becomes Deputy Director in preparation for taking over as BIPM Director next year.

EMRP

European Metrology Research Programme
 Programme of EURAMET

EU supports future metrological research

€400 million research programme creates new foundation for precision measurements in the health care, energy, environmental and advanced technology sectors.

The European Parliament has made a decision to support a proposal for the largest and most ambitious research programme on metrology in Europe to date. The European Metrology Research Programme (EMRP) aims to integrate relevant European national programmes and activities to accelerate the development of vital research capabilities that, on the one hand supports competitiveness and on the other hand provides an infrastructure that supports EU policies.

EMRP Call 2009

to advance measurement science and technology in the field of **Energy** now open

World Metrology Day 2009 May 20th

The Metre Convention (Convention du Mètre) is a treaty that provides the basis for the international agreement on units of measurement. It was signed in Paris on 20 May 1875 by representatives of seventeen (17) states. Today, fifty-two (52) states adhere to the treaty and many others enjoy its benefits.



World Metrology Day (WMD) commemorates the signing of the treaty and it is a day when all the countries in the world that enjoy the benefits of a single, coherent system of measurements, traceable to the International System of Units (SI), celebrate the scientific, technological, and economic achievements that this treaty has enabled for more than a century.

<http://www.worldmetrologyday.org/index.html>

International Congress of Metrology 2009



The 14th International Metrology Congress will take place in Paris on 22-25 June 2009. The Congress is a meeting place for specialists in metrology from industry and scientific laboratories through :

- 6 industrial round table sessions, and about 180 presentations.
- a 90 booths exhibition of equipment and services,
- technical visits to companies.

The aim of the Congress is to contribute to the improvement of measurement in industry and research.

The Congress is organised by CFM in partnership with

- industrial users of metrology : Eurocopter, Renault
- technical centres and providers : Acac, BEA Métrologie, Cetiat, Cetim, IMQ
- national institutes of metrology : LNE (FR), NPL (UK)
- representatives from universities
- European and international metrology key organisations : EA, EURAMET, BIPM, OIML

There will be strong EURAMET input to the Congress with many contributions on EURAMET activities.

EURAMET Calibration Guides

EURAMET has published a number of calibration guides which are intended to improve harmonisation in the calibration of measuring instruments.

The following guides are available from EURAMET. All guides can be downloaded as pdf-versions from the EURAMET Website

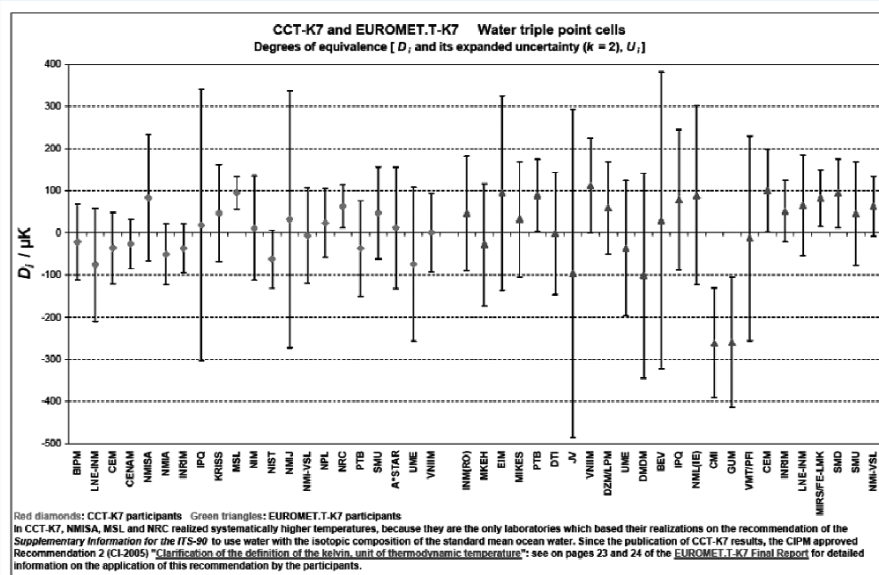
No Calibration Guides

- 01 Calibration of Stylus Instruments for Measuring Surface Roughness *
- 02 Calibration of Gauge Block Comparators
- 03 Calibration of Pressure Balances *
- 04 Uncertainty of Calibration Results in Force Measurements *
- 05 Coordinate Measuring Machine Calibration
- 06 Extent of Calibration for Cylindrical Diameter Standards
- 07 Calibration of Oscilloscopes *
- 08 Calibration of Thermocouples
- 09 Measurement and Generation of Small AC Voltages with Inductive Voltage Dividers
- 10 Determination of Pitch Diameter of Parallel Thread Gauges by Mechanical Probing
- 11 Guidelines on the Calibration of Temperature Indicators and Simulators by Electrical Simulation and Measurement
- 12 Guidelines on the Evaluation of Vector Network Analysers (VNA)
- 13 Guidelines on the Calibration of Temperature Block Calibrators
- 14 Guidelines on the Calibration of Static Torque Measuring Devices
- 15 Guidelines on the Calibration of Digital Multimeters
- 16 Guidelines on the Estimation of Uncertainty in Hardness Measurements
- 17 Guidelines on the Calibration of Electromechanical Manometers
- 18 Guidelines on the Calibration of Non-Automatic Weighing Instruments
- 19 Guidelines on the Determination of Uncertainty in Gravimetric Volume Calibration

* The guide is presently under revision and therefore only available in a previous format. It will soon be published as EURAMET Calibration Guide.

EURAMET Key Comparison

A central element of EURAMET activities is the coordination of matters for NMI's with respect to the CIPM MRA. One of the main pillars of the CIPM MRA is that of Key and Supplementary Comparisons. EURAMET develops and coordinates comparisons in all fields. The following presents the results of EURAMET.T-K7 - comparison of water triple point cells.



The BIPM key comparison database, January 2009

This EURAMET key comparison is a regional extension of the earlier CIPM Consultative Committee for Thermometry key comparison CCT-K7 (2002-2004). Nine of the 24 participating NMIs in the EURAMET project had participated in CCT-K7, thereby ensuring robust linkage between the regional and global comparisons.

These comparisons can be considered a powerful tool in confirming the impact of the recently refined definition of the water triple point temperature in terms of VSMOW. In the European comparison, the EURAMET.T-K7 reference value was found interestingly to be 65 μK higher than CCT-K7 KCRV (thus agreeing within few μK with the best estimate of the SI unit). For further information contact: EURAMET, TC-T Chair, Wolfgang.Buck@ptb.de

Focus Group on Facilitating National Metrology Infrastructure Development

The Focus Group on facilitating national metrology infrastructure development is concerned with facilitating cooperation and acceleration of the integration process of new and emerging EURAMET members and associates into existing EURAMET structures. The major tasks and activities within this focus group are as follows, to

- organize joint training and comparisons
- facilitate joint use of facilities and collaboration between NMIs
- support networking and awareness
- assist corresponding applicants in their intention for membership in EURAMET

The focus group aims at the promotion and facilitation of the metrology infrastructure and contributes in raising awareness about development in metrology and quality infrastructure in the countries of the participating NMIs.

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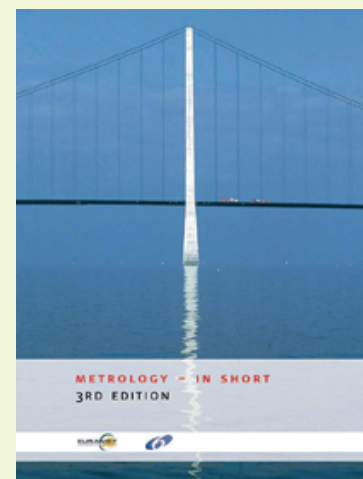
VIM3, GUM, and Supplement 1 to the GUM now available for free download :

The BIPM is proud to announce the publication of the 3rd edition of the International Vocabulary of Metrology (VIM3), and Supplement 1 to the GUM (Guide to the Expression of Uncertainty in Measurement) on its website – see JCGM 200:2008 (E/F) and JCGM 101:2008 (E).

– NEW! The Guide to the Expression of Uncertainty in Measurement (GUM) can also be downloaded free of charge (see JCGM 100:2008).

Metrology - In Short

EURAMET is pleased to announce the revised and extended 3rd edition of "Metrology - in short". The publication is now available for free download from the EURAMET Website

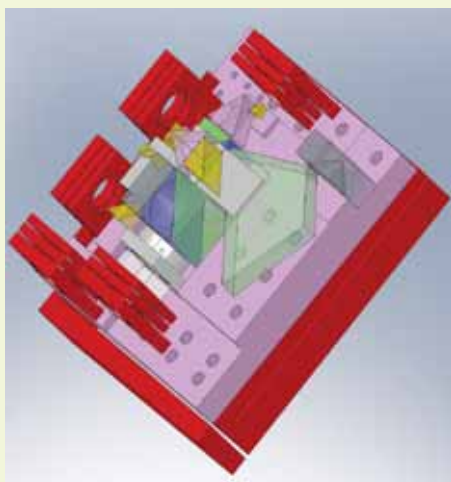


EURAMET General Assembly 2009 will take place in Malta on June 8th to 10th 2009

EURAMET "new" member Cyprus becomes 33rd EURAMET Member 1st January 2009

EURAMET Research Projects

Under the framework of ERA-NET-plus, EURAMET has over 20 joint research projects running from nanotechnology, cancer therapy and high precise length measurements to the re-definition of the kilogram. The following are two examples of projects in operation.



EURAMET JRP Project T1 J1.1 (e-MASS) The watt balance route towards a new definition of the Kilogram

The kilogram is the last unit of the international system (SI) still based on a material artefact, the international prototype of the kilogram (IPK). A promising route towards a new definition based on fundamental constants is given by the watt balance experiment (WB) which links the mass unit to the Planck constant (h). Such a definition would not only allow to realise the unit of mass at different places at the same time but also improve the consistency of the SI and reduce the uncertainties. All units depending on the kilogram such as the ampere, the mole or the candela would no longer depend on the behaviour of a material artefact.

The e-MASS project supports the effort of the two European experiments of METAS and LNE and creates synergy between the teams to share their expertise in order to develop new tools, techniques and methods in several fields of application.

The e-MASS project is a unique opportunity to merge the expertise from the different laboratories and gather the experience of each one, in order to provide advice to laboratories planning to develop a watt balance for the "mise en pratique" of the future definition of the kilogram. A critical analysis of the different existing devices will be done to select the methods, techniques and design of individual components best suited for the realisation of an optimised watt balance.

The main goal of the e-MASS project is to bring the European laboratories presently developing watt balances at a level sufficient to allow future determinations contributing significantly to a new definition of the mass unit.

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EURAMET JRP Summary for Project T2 J02 (Breath analysis) Breath analysis as a diagnostic tool for early disease Detection

Early disease detection is getting increased attention in the medical sector. For many diseases early disease detection can literally mean the difference between life and death.

Breath analysis is one of the clinical tests that can be used for early disease detection. It is non-invasive, and once operational, relatively easy to maintain and handle "on-site". Recent developments in laser absorption spectroscopy (LAS) techniques, and in particular cavity ring down spectroscopy (CRDS) and tuneable diode laser absorption

spectroscopy (TDLAS), allow developing small, calibration-free devices for performing these tests. The devices must of course have a high level of accuracy, robustness, and reliability with respect to measurement of extremely low levels of trace gas components usually encountered in human breath.

Although the development of suitable (parts of) equipment is well underway, there is still a long way to go, not least because of a lack of accuracy and reliability in measurement results. This project addresses these issues by

aiming to make reliable identification of the species present in the exhaled breath, and for a selected set of biomarkers to reduce the uncertainty of measurement of the amount of substance from the current typical 10% down to at most 1-2%.

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