

RESPONSE FORM

Standardization needs and suggestions to EURAMET for consideration in their 2017 EMPIR call

In the frame of the between CEN, CENELEC and EURAMET, CEN and CENELEC have been invited by the EURAMET Management to put forward their testing and measurement needs in **Industry**, in **Fundamental** and in **Pre- and co-normative research**.

Relevant technical groups (sector fora, advisory boards, coordination groups, TCs...) are invited to contribute with:

- a short introduction or an overview paper of their unaddressed standardization needs for testing and measurement, and
- a contact person (secretary, chair, convenor, liaison officer, etc.) whom proposers for the Potential Research Topics can contact,

using the table below, **before 12 December 2016**

Source of the identified need (identification of TC, WG, etc, incl. title)	<input type="checkbox"/> CEN/TC 0/WG 0 <input type="checkbox"/> CLC/TC 0/WG 0 <input checked="" type="checkbox"/> ISO/TC 12/SC 0 / WG 0 <input type="checkbox"/> IEC/TC 0/SC 0 / WG 0 <input type="checkbox"/> Other, namely ,
European entity responsible for submission of the need	<i>SIS (SE)</i>
Person that can be contacted for more detail (name, e-mail and telephone number)	<i>Dr L R Pendrill, Chair ISO/TC12 leslie.pendrill@sp.se +46 767 88 54 44 Sweden</i>
Unaddressed need (short description)	<i>Quality assurance of metrological data (traceability, uncertainty) in more qualitative situations, where humans (as customers, patients etc) are the centre of focus, is still in its infancy.</i>
Type of work (more answers possible)	<input checked="" type="checkbox"/> pre-normative <input type="checkbox"/> SI-units <input checked="" type="checkbox"/> co-normative <input type="checkbox"/> interlaboratory study <input checked="" type="checkbox"/> testing <input type="checkbox"/> fundamental research <input checked="" type="checkbox"/> measurement <input type="checkbox"/> market support <input type="checkbox"/> energy <input type="checkbox"/> environment
Estimated effort (if known)	Person months: 100
Further explanation of need (TC business plan, road map, formal decision, work item, etc.)	<i>ISO/TC12 Quantities & units Business plan enclosed</i>
Enclosures	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Email address for sending the Response Form:

STAIR EMPIR WG, Mr Ortwin Costenoble (empir@nen.nl)

1 Background

TC12 Quantities and units is a committee established in 1947. Its scope is the standardization of units and symbols for quantities and units (and mathematical symbols) used within different fields of science and technology, giving, where necessary, definitions of these quantities and units. Standard conversion factors between the various units.

2 Business Environment

2.1 General

In society, processes and products will acquire better interoperability, improved communication and can be more reliably traded, and ensured safe when tested with measurement expressed in terms of harmonised units and symbols. Harmonised treatment of quantities¹ and units will facilitate the route to market for innovative products and services of all kinds.

2.2 Market demand and trends

The ISQ is driven by increasing demands for unified measurement in many of the major societal areas of challenge. In addition to traditional areas, such as global trade manufacturing and trade, 21st Century challenges benefitting from harmonised quantities are sustainable energy production, environmental protection and better health.

Standardised quantities and units are essential where legislation, regulations and directives in many areas of contemporary concern are implemented through a system of conformity assessment. In important areas such as public health, safety & security, protection of the environment and the consumer and of fair trading, there is increasing need to harmonise decision-rules in the presence of measurement uncertainty.

2.3 Trends in Science & Technology

In science, physical laws and the fundamental constants are invoked to relate different quantities and their units. The ISQ is enabled by advances in fundamental science and technology, be it a new unit based on Nobel-prize winning research or refined measurement on the nanoscale, for instance.

Recent trends in the need for standardisation of quantities and units as expressed by stakeholders and which may stimulate new work items for ISO/TC12 include the following.

- The quality assurance of metrological data in more qualitative situations, where humans (as customers, patients etc) are the centre of focus, is still in its infancy.
- Modern data collection increasingly integrates data from multiple systems, both in laboratory set-ups as well as Internet search engines. Without standardisation there can be a lack of consistency – both in terms of metadata and document formats². The uniform expression of both measurement quantities and units in these data sets can be

¹ International System of Quantities (ISQ)

² B Harlen 2013 “The data dilemma”, *Scientific Computing World*, pp 9 – 12, June/July 2013, www.scientific-computing.com,

improved through agreed standard approaches for instance in XML³; a metrology information infrastructure⁴; and with specialised indexing language as documents are entered into repositories⁵.

2.4 Liaisons

Apart from producing its own standards, TC12 assists in reviewing the use of quantities and units in other ISO standards and similar documents while, at the same time, encouraging input from third parties to influence its own standards development.

In addition to the diverse groups in ISO for specific sectors and technologies, ISO/TC12 interacts with the ‘generic’ standards groups for conformity assessment (ISO/TC176 Quality management and quality assurance) and statistics (ISO/TC69 Applications of statistical methods). There is a ‘division of labour’ between handling the International Systems for Units (CGPM) and Quantities (ISO). Other compilations in this area include those made by IUPAC and IUPAP. See further in §3.

3 Representation and participation in ISO/TC 12

Current lists of participants and liaisons are found on the ISO website: [ISO/TC 12](#) Participating countries and ISO/TC 12 ISO and IEC committees and organizations in liaison.

4 Objectives of ISO/TC 12 and strategies for their achievement

4.1 Defined objectives of ISO/TC 12

The main objective is to harmonize the International Standards from ISO and from IEC on the basic subject Quantities and units. Many customers today use Standards, as well from ISO as from IEC. Therefore there must be no contradiction in basic Standards from the two organizations, where there is an overlap. The main objective is to maintain only one International Standard; ISO 80000 and IEC 80000, *Quantities and units* in 14 parts. There are still some more specific matters which will remain subject to standardization by only one of the two Standards bodies, e.g. telecommunications and electrical power technology (IEC).

4.2 Identified strategies to achieve the ISO/TC 12's defined objectives

The strategy is to establish joint working groups with other ISO/TCs and other International organizations to carry out the work to continuously update all parts of the International Standard ISO 80000 and IEC 80000, *Quantities and units*.

³OASIS UnitsML TC, “Defining an XML-based specification to enable the unambiguous representation of units of measure”, https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=unitsml

⁴ M Kuster 2013 “Toward a Metrology Information Infrastructure: Standardize and Automate”, *Metrologist*, January 2013, pp 14 – 7, www.ncsli.org

⁵ S D Clarke 2013, “Overcoming the logistics of language barriers”, *ISO Focus*, pp 43 – 4, April 2013, www.niso.org/schemas/iso25964/