EMPIR Call 2014 – Industry and Research Potential

Selected Research Topic number: **SRT-r09**
Version: 1.0

Title: Traceability for Humidity

Abstract

Control of humidity is critical to many industrial processes yet the relevant sensors require regular calibration. This Selected Research Topic focuses on those NMIs that need to develop a research potential in this area to support their local industries.

Keywords

Humidity, traceability, dew-point temperature, relative humidity, uncertainty analysis

Background to the Metrological Challenges

Measurement and control of humidity is critical to many industrial processes. The printing industry needs to control humidity tightly because changes in humidity affect the handling properties of paper in high speed presses. In many industrial processes low humidity can promote electrical discharges, and in others high humidity can cause undesired chemical and physical changes in the actual process, the raw materials or the products produced. This can lead to poor or variable quality or performance of the manufactured products. The most common humidity sensors, based on capacitance measurement, drift significantly over time and therefore require regular calibration. NMIs need to maintain standards in this field which allow them to provide fast, cost effective calibration services for the various instrument types.

An NMI or DI wishing to establish a research capacity in this area would do so through the development and validation of their primary standards and transfer methods. These activities would build on the experience of more developed NMIs, using their expertise to optimise the system for the particular needs of that country. The validation process would involve the NMI establishing the capability participating in comparisons and analysis of uncertainties with others establishing similar facilities and those with long established facilities. The whole process would result in both the development of the procedures, the development of the relevant staff and the development of relationships between the establishing NMI and more experienced researchers in the field which would foster further joint research activities beyond the life of the project.

Objectives

Proposers should address the objectives stated below, which are based on the PRT submissions. Proposers may identify amendments to the objectives or choose to address a subset of them in order to maximise the overall impact, or address budgetary or scientific / technical constraints, but the reasons for this should be clearly stated in the proposal.

The JRP shall focus on the development of metrological research capacity in the humidity standards.

The specific objectives are

1. For the participating countries wishing to develop research capabilities in humidly traceability to develop relevant equipment and operating procedures.
2. For each participant to develop an individual strategy for the long-term development of their research capability in humidity traceability including priorities for collaborations with the research community in their country, the establishment of appropriate quality schemes and accreditation (e.g. participation in key comparisons, the entry of CMCs into the BIPM database, accreditation to ISO/IEC 17025). They should also develop a strategy for offering services from the established facilities to their own country and neighbouring countries. The individual strategies should be discussed within the consortium and with other EURAMET NMIs/DIs, to ensure that a coordinated and optimised approach to the development of traceability in this field is developed for Europe as a whole.

Proposers shall give priority to work that meets documented metrological needs and activities that will lead to an improvement in European metrological capability and infrastructure beyond the lifetime of the project.

Proposers should establish the relevant current capability for research, and explain how their proposed project will develop capability beyond this.

EURAMET has defined an upper limit of 500 k€ for the EU Contribution to any project in this TP, and a minimum of 100 k€.

EURAMET also expects the EU Contribution to the external funded partners to not exceed 10 % of the total EU Contribution to the project. Any deviation from this must be justified.

Potential Impact

Proposals must demonstrate adequate and appropriate participation/links to the “end user” community, describing how the project partners will engage with relevant communities during the project to facilitate knowledge transfer and accelerate the uptake of project outputs. Evidence of support from the “end user” community (e.g. letters of support) is also encouraged.

You should detail how your JRP results are going to:

- Address the SRT objectives and deliver solutions to the documented needs,
- Provide a lasting improvement in the European metrological capability and infrastructure beyond the lifetime of the project,
- Facilitate improved industrial capability or improved quality of life for European citizens in terms of personal health or protection of the environment,
- Transfer knowledge to the calibration and testing sector and the metrology community.

You should detail other impacts of your proposed JRP as specified in the document “Guide 4: Writing Joint Research Projects”.

You should also detail how your approach to realising the objectives will further the aim of EMPIR to develop a coherent approach at the European level in the field of metrology and include the best available contributions from across the metrology community. Specifically the opportunities for:

- improvement of the efficiency of use of available resources to better meet metrological needs and to assure the traceability of national standards
- the metrology capacity of EURAMET Member States whose metrology programmes are at an early stage of development to be increased
- organisations other than NMIs and DIs to be involved in the work

Time-scale

The project should be of up to 3 years duration.