

RESEARCH AND STANDARDISATION

RESPONSE FORM for Standardisation groups



To contribute to *EMPIR - the European Metrology Programme for Innovation and Research* *

Objective: to collect standardization needs and suggestions to develop research projects in testing and measurements for the upcoming EMPIR calls in 2020

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 research** for consideration by metrology institutes for future calls under EMPIR.

Relevant technical groups (sector fora, advisory boards, coordination groups, TCs, WGs...) **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,

by using this Response Form and send it at :

STAIR EMPIR secretariat, Mr Ortwin Costenoble: empir@nen.nl

Deadline for the consultation: **13 December 2019**.

Proof of need by the TC/SC is highly recommended for a successful submission.

Source of the identified need (identification of TC, WG, etc, incl. title)	<input checked="" type="checkbox"/> CEN/TC 264/WG 42
European entity responsible for submission of the need	CEN/TC 264 'Air Quality'
Person that can be contacted for more detail	<i>Rudolf Neuroth</i> <i>neuroth@vdi.de</i> <i>+49 211 6214-544</i> <i>Germany</i>
Unaddressed need (short description)	<i>Air quality- Performance evaluation of low-cost air quality sensors</i> Low cost sensor systems are transforming ambient air quality (AQ) monitoring with the prospect of delivering spatially dense pollution data rapidly in real time with the implementation of new large networks, which complement the established reference methods defined in EU Air Quality Directives. Currently, there are no standardized means to verify that the AQ data generated from these new technologies meet the

	<p>performance requirements for regulatory reporting (e.g., indicative measurements) or other evolving applications. This presents a major barrier to market expansion with end users/regulators having no clear way to judge whether their purchases will fulfil their claimed sensitivity, accuracy, specificity and uncertainties. It is also important that certain European states do not separately implement validation schemes, on an ad-hoc basis, as this will lead to unnecessary duplication of effort and an unharmonized approach to assessment.</p> <p>For the above reasons CEN/TC264 WG42, is currently tasked with addressing these metrology issues and formulating a “Technical Specification (TS)” for air- and PM- based sensor systems covering regulatory reporting and non-compliance measurements, through a mandated new work item (NWI) covering the molecules O₃, NO, CO, SO₂, CO₂, and particulate material (PM_{2.5} and PM₁₀).</p> <p>The proposed TS requires pre-normative research to ensure that the harmonised standardization approach is fit for purpose. The evaluation, consisting of targeted laboratory type tests, and field collocation study tests measuring alongside reference instruments, needs to be carried out at multiple sites with different levels of pollution and during different seasons in the year. Furthermore, a novel approach to calibration and quality assurance is required to be applied for extended networks, which is very different from current methods employed for reference instruments.</p>
<p>Further explanation of need (TC business plan, road map, formal decision, work item, etc.)</p>	<p>EMPIR funding is requested to carry out the fundamental research to validate the Technical Specification being developed by WG42 as a mandated NWI. The requirement for this research is immediate to maximize the exploitation of this novel technology and deliver significant improvements in the approach to measuring ambient air quality.</p> <p>Support is required to:</p> <ul style="list-style-type: none"> • Upgrade facilities and carry out proposed laboratory and field tests in accordance with TS (and identify any changes required) for selected low cost sensor systems to establish that they fulfil the measurement uncertainty requirements defined in EU AQ Directives • Develop new calibration and QA/QC strategies for systems operating in the field in networks including the use of direct calibration against standard reference instruments, and calibrations against transfer standards to overcome the key metrology challenge limiting the potential use of this type of technology • Employ mathematical models and machine learning techniques to exploit network knowledge and deliver new cloud-based calibration methods that are traceable to reference methods, and maximise the usefulness of the information to identify issues such as sensor malfunctioning
<p>Enclosures</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p>

*See more information at

[EMPIR website](#)

[CEN/CENELEC website “Standards and metrology”](#)