Project status quo

Sulf-Norm

Metrology for sampling and conditioning SO_2 emissions from stacks

An ongoing prenormative research project of 2015 EMPIR Call

CEN Need: CEN/TC 264/WG 16

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The current Standard Reference Method for measuring emissions of SO2 from stacks and flues (EN 14791) is unlikely to meet some of the increasingly stringent emission limits coming into force under the Industrial Emissions Directive (2010/75/EU) and associated Best Available Technique Reference (BREF) documents. Instrumental techniques (automated methods) could in principle provide improved measurement performance but require sample conditioning which is as yet not fully characterised. This proposal would deliver the pre-normative technical work required to properly understand and develop suitable method to ensure successful transfer and conditioning of a representative sample from the stack / flue to the analytical instrument.

PreCEDE – Pre-normative Research for Sampling and Conditioning SO$_2$ Enabling Enforcement of Decreased Emissions from Stacks

B.2. Abstract

With an economic cost of EU air pollution of €102-169 billion [1] and the Aphekom project [2] establishing a linear relationship between SO$_2$ air pollution and mortality, the need for the increasingly stringent emission limits under the Industrial Emissions Directive [3] is clear. However, to enforce these lower limits a new reference method is needed but this is being delayed as the instrumental techniques on which it would be based require a filtered and dried gas stream. Due to the complex nature of stack gas matrices this presents risks of sampling losses due to physical changes / chemical reactions, which must be resolved to allow standardisation and ultimately enable enforcement of lower limits.

B.3. Keywords

SO$_2$ emissions, Standard Reference Method, Industrial Emissions Directive, CLRTAP, CEN/TC 264, Air Quality.

B.4. Scientific and technological objectives

CEN/TC 264, *Air Quality*, have requested, via letter [4] submitted to the 2015 Pre-Co-Normative Orientation stage, work concerning sampling and conditioning of SO$_2$ from stacks and flues. They have identified this

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Sulf-Norm – EMPIR 15NRM01

Duration July 2016 - 2019

Coordinator: NPL (UK)

Consortium : 9 funded partners

➢ **3 EURAMET Metrology Institutes**

- CMI (Czech Republic)
- MIKES (Finland)
- NPL (United Kingdom)

➢ **6 Other participants**

Environment Agency (UK)
Hessisches Landesamt für Naturschutz
Umwelt und Geologie (Germany)
Nab Labs Oy (Finland)
Ramboll Finland Oy (Finland)
The Source Testing Association (UK)
Uniper Technologies Ltd (UK)

Overall objectives of the project

To carry out pre-normative research :

- to contribute to the developement of a new Reference Method for robust regulatory monitoring of Sulfur Dioxide (SO_2) emissions from industrial processes

- In order to support the full implementation of the EU's Industrial Emission Directive (IED) and the work of CEN/TC 264 « Air Quality »

Need for the project

- Sulphur dioxide→pollutant→effects on human health, aquatic ecosystems, and forests, crops and other vegetation

- Recent Industrial Emissions Directive (IED/2010) brings stringent emission limits for a range of pollutants including SO_2

- Existing Standard Reference Methods (SRMs) for the measurement of sulphur dioxide emissions, produced by CEN under EC mandate, are no longer fit for purpose at the low levels permitted by IED

- This issue has been formerly recognised by CEN/TC 264 who have highlighted the following future needs: "identify new monitoring requirements of the IED"; "assessment of current SRM to meet stricter limit values"; and "automated methods for measuring emissions" (N2204 Future Work Items of CEN/TC 264).

Project objectives

- To determine as a benchmark for comparison, the sampling performance of the existing Standard Reference Method for SO_2 (EN 14791) for a range of industrial processes

- To investigate different materials (e.g. stainless steel, borosilicate glass, ceramic) for conditioned sampling for use with different stack gas matrices i.e. in order to avoid sample alteration e.g. due to catalysing surface reactions.

- To evaluate drying technologies for conditioned sampling based on chilling and permeation principles to determine which processes are at risk of sample bias.

- To work closely with CEN/TC 264/WG16 during the lifetime of the project and to contribute to a future revision of EN 14791 by providing data and methods necessary for SO_2 sampling and to the production of CEN Technical Specification SO_2 to move closer towards EN status

Expected impact on the stakeholder

stakeholder	Impact mechanism
CEN community	Up to 6 standards (including the SO_2TS) covering a range of pollutants regulated under the IED
Stack Testing organisations	Improved quality and decreased labor costs
Plant Operators and National regulators	Real-time data decreasing exceedances, improving compliance with regulation and public perception of industry reputation and regulator enforcement
Instrument manufacturers	Acceptance of a method for SO_2 by P-AMS opening up the instrument market

Some strengths that made project proposal successful

- Demonstration at high level of capabilities and knowledge of all partners (accreditation, experience, testing facilities, legislation/standardisation knowledge)

- Engagement outside the metrology community : Good mix of partners with national regulator, plant operators, stack testing organisations, instrument manufacturers

- Strong link with standardisation committees as NPL, the coordinator of the project, is involved in CEN/TC 264 and different WG

- Effective support of the convenor of CEN/TC 264/WG16 expecting the project results for the benefit of a large community.

Thank you for your attention!

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