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DIRECTORATE-GENERAL
ENVIRONMENT
Directorate C - Sustainable Resources Management, Industry & Air
ENV.C.3 - Industrial Emissions, Air Quality & Noise

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STANDARDISATION MANDATE TO CEN, CENELEC AND ETSI UNDER DIRECTIVE 2010/75/EU FOR A EUROPEAN STANDARD METHOD FOR THE AUTOMATIC DETERMINATION BY MEASUREMENT OF THE CONCENTRATION OF GASEOUS HYDROGEN CHLORIDE (HCL) IN WASTE GASES EMITTED BY INDUSTRIAL INSTALLATIONS INTO THE AIR

1. OBJECTIVE

The Commission requests European standardisation organisations CEN, CENELEC and ETSI (hereafter ESOs) to prepare a new European standard to measure specifically the concentration of gaseous hydrogen chloride (HCl) in waste gases from industrial installations (waste incineration plants, combustion plants, other) by an automated method. This mandate requires to assess the fidelity of the method and to provide relevant QA/QC procedures to avoid any systematic errors in the determination.

2. BACKGROUND

2.1. Relevance of hydrogen chloride emissions

Hydrochloric acid or hydrogen chloride (HCl) has a high acute toxic effect on all forms of life. When released into the atmosphere (as a gas), it will undergo wet and dry deposition, and will be readily incorporated into cloud, rain, and fog water, thus forming a component of acid rain. It also contributes to the processes that cause photochemical smog. Furthermore, HCl accelerates the dissolution of many minerals, such as the carbonates (including limestone) and all alumino-silicates (such as clays and many igneous rocks). It thus contributes to the decay of limestone buildings, other structures such as bridges, and art works.

2.2. Policy and legal framework

Following the environmental protection objectives laid down in the Article 11 and Article 191 of the Consolidated Version of the Treaty on the Functioning of the European Union (ex Article 6 and Article 174 TEC) several Directives have been adopted to tackle the pollution caused by the operation of industrial activities. The package of industrial emissions legislation has recently been recast and integrated into the Industrial Emissions Directive 2010/75/EU (IED). The IED requires the largest industrial activities within the EU to be operated in accordance with the conditions set out in an integrated permit, granted by the competent authorities.

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Those conditions – in particular the limit values for emissions into the air, water and soil - shall be based on the application of the best available techniques (BAT). Emission limit values in the permits should cover all of the relevant pollutants emitted by the installation concerned. Annex II of the IED provides for an indicative list of pollutants and includes a reference to "chlorine and its compounds".

In addition, the IED, as its predecessors such as Directives 2001/80/EC (on large combustion plants) and 2000/76/EC (on waste incineration and co-incineration plants), lays down emission limit values for different pollutants as minimum requirements to be respected by the operators. In addition, In addition, Annex VI of the IED containing technical provisions relating to waste incineration plants and waste co-incineration specifies emission limit values for "hydrogen chloride (HCl)". Part 6 point 1.2 of that Annex mentions that sampling and analysis of all polluting substances as well as the quality assurance of automated measuring systems and the reference measurement methods to calibrate them shall be carried out according to EN standards. If EN standards are not available, ISO, national or other international standards which ensure the provision of data of an equivalent scientific quality shall apply. Automated measuring systems shall be subject to control by means of parallel measurements with the reference methods at least once per year.

Currently, the European manual reference method, as described in EN 1911:2010[1], consists of the determination of all inorganic gaseous chlorides expressed as HCl. However, the emission limit value in the Waste Incineration Directive (2000/76/EC) and in the IED (Annex VI) is targeting specifically gaseous hydrogen chloride (HCl) and not the other inorganic chlorides.

Therefore, the availability of a new standardised method allowing the monitoring of emissions of hydrogen chloride (HCl) from the installations concerned as well as the calibration of on-site automated measurement systems is a necessary condition for the efficient implementation of the Directive.

This mandate asks the ESO to develop a voluntary European standard which can be used in the measurements of HCl within the context of the conditions to be set out in permits issued according to the IED, in particular for waste incineration plants and waste co-incineration plants (Chapter IV and associated Annex VI of the IED)

3. DESCRIPTION OF THE MANDATED WORK

The Commission requests the ESOs to prepare a reliable, accurate and reproducible European standard to measure specifically gaseous hydrogen chloride (HCl) concentrations in waste gases of industrial installations by means of an automated method using infra-red techniques. Before its final adoption the fidelity of the method needs to be assessed and relevant QA/QC procedures have to be provided in order to avoid any systematic errors in the concentration determination.

This standard shall include the following elements:

1. Scope

[1] EN 1911:2010 Stationary source emissions - Determination of mass concentration of gaseous chlorides expressed as HCl - Standard reference method

2. Normative references

3. Terms and definitions

4. Principle

5. Sampling system

6. Analyzer equipment

7. Determination of the characteristics of the method: analyzer, sampling and conditioning line with relevant performance characteristics and performance criteria including uncertainty

8. Field operation with measurement plan and sampling strategy, setting of the analyzer on site, preliminary zero and span check, and adjustments, zero and span checks after measurement

9. Ongoing quality control

10. Expression of results

11. Test report

The standard shall also be validated in the field. The objectives of these validation tests are:

- to test the relevance of performance criteria
- to obtain repeatability and reproducibility data
- to give advice on the time necessary to have a good calibration of the instrument and passivation of the sampling line.

For this test programme, several instruments using different techniques should be chosen, including:

- Gas Filter Correlation (GFC),
- Tunable Diode Laser (TDL),
- Fourier Transform Infrared Spectroscopy (FTIR),
- Ion Mobility Mass Spectrometry (IMS).

The tests should involve 4-8 different "portable" instruments (if possible two per technique to provide repeatability data) which are able to determine concentrations of HCl in the range 0-50 mg/m³, representative for three different configurations of plants:

- waste incineration plants equipped with wet waste gas cleaning equipment, with HCl emission levels expected to be close to the quantification limit (2 - 3 mg/m³);

- waste incineration plants equipped with dry waste gas cleaning equipment, with HCl emission levels expected to be around the emission limit value set out in Directive 2010/75/EU (10 mg/m³);

- combustion plants firing solid fuels, with HCl emission levels expected to be around 50 mg/m³.

The actual measurements should be carried out by laboratories accredited for performing stack emission measurements.

Three different options could be considered (some pros and cons are given below) and should be chosen from. The tests should include at least the following steps:

- Selection of candidate instruments

- Pre-evaluation

- On site comparative tests and/or comparative tests on a bench

  This should consist of two days with 8 hours of measurement including zero and span adjustments, leak checks and control checks for drift. The measurement with one or two analysers of the same type will be carried out by an accredited measuring team (eventually with the help of the manufacturer of the analysers). The gas for calibration of the analysers will be provided by the participants.

- Data processing, report

Option 1° Validation test on the three different plant types:

Pro: possibility to test the instruments on real installations

Con: it may be challenging to find a sufficient number of suitable plants with enough place to install up to 8 instruments on the platform and it will not be possible to make variations of the concentrations.

Option 2: Test on a bench able to simulate, with real matrices, the three different plants

Pro: possibility to install multiple instruments on the platform; possibility to cover the whole range of HCl concentrations; possibility to study the influence of other gases (water vapour, NH_3)

Con: it does not allow to test the instruments on real installations

Option 3: test on a bench able to simulate, with real matrices, the three different plants and one field test on one incinerator

Pro: possibility to install multiple instruments on the platform; possibility to cover the whole range of HCl concentrations; possibility to study the influence of other gases (water vapour, NH_3) as well as the possibility to test one instrument of each type on an industrial site.

4. EXECUTION OF THE MANDATE

The ESOs shall inform the Commission **within two (2) months** after the receipt of this request, if they accept this mandate and a work plan for the execution of the standardisation tasks given in clause 3.

The ESOs are requested to communicate to the Commission within **18 months** as of the acceptance of this mandate an interim report on the progress of the tasks set out in this mandate, including the results of the validation tests performed and indicating any eventual difficulties encountered.

The ESOs are requested to provide to the Commission, in its three working languages, a copy of the standard(s) developed under this mandate within **36 months** of the acceptance of the mandate.

Acceptance by the ESOs of this mandate starts the standstill period referred to in Article 7 of Directive 98/34/EC of 22 June 1998 (Of N° L 204/37 of 21 July 1998).

5. BODIES TO BE ASSOCIATED

As appropriate, the ESOs shall invite the representative organisations of consumers' interests (ANEC), environmental protection (ECOS), workers (ETUI) and small and medium-size enterprises (NORMAPME) to take part in the standardisation work.