



Call for tender

for the validation of the Measurement Systems and the synthesis report on the measurement campaigns (one test bench and two field tests) in order to standardize an automated HCl (Hydrogen Chloride) emission method.

Deadline for tenders: 22 September 2016

1. Introduction

1.1 General

The European Committee for Standardization (CEN) is a business facilitator in Europe, removing trade barriers for European industry and consumers. Its mission is to foster the European economy in global trading, the welfare of European citizens and the environment. Through its services, it provides a platform for the development of European Standards and other technical specifications. It consists of the 34 national standardization bodies of the European Economic Area which work together to develop voluntary European Standards (EN), together with the CEN CENELEC Management Centre (CCMC).

AFNOR is the French representative within European and international standards organizations, working to the benefit of the innovation, performance and sustainable development of companies and civil society. As the central coordinator of standardization in France, AFNOR conducts a census of standard requirements and mobilizes the interested parties.

The following project requires the development and validation of the required test method described in the CEN/TS 16429 "Stationary source emissions - Sampling and determination of hydrogen chloride content in ducts and stacks - Infrared analytical technique".

For this project, several manufacturers, laboratories, a bench owner, power plants administrators and a project coordinator will be contracted.



This call for tenders aims to validate the Measurement Systems and to synthesize the results of the measurement campaigns of validation (one test bench and two field tests) in order to standardize an automated HCl (Hydrogen Chloride) emission method.

1.2 Context

The validation work to be performed is directly linked to Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) and it will support implementation of the Directive.

Currently, the European manual reference method, as described in EN 1911:2010, consists of the determination of all inorganic gaseous chlorides expressed as HCl. However, the emission limit value 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.

With Mandate M/513 of January 2013, the European Commission (EC) charged the European Committee for Standardization (CEN) to elaborate a new standard.

In January 2013, the CEN Technical Board (BT) accepted Mandate M/ 513 and allocated the work to CEN/TC 264 "Air quality". The Commission on Air Pollution Prevention of VDI (Verein Deutscher Ingenieure e.V.) and DIN (Deutsche Institut für Normung e.V.) – Standards Committee KRdI – holds the secretariat of CEN/TC 264.

The Working Group CEN/TC 264/WG 3 is responsible for the development of standards about HCl emission. AFNOR provides the secretariat of CEN/TC 264/WG 3 and will perform the administrative management of the standardization work.

Standardized methods of analysis are of utmost importance for guaranteeing a uniform application of European legislation in all Member States. For this reason, the elaboration of a new standard describing a method for the automatic determination of the concentration of gaseous hydrogen chloride (HCl) in waste gases emitted by industrial installations into the air is required. This is the subject of this call for tender.

1.3 New standard

The draft Technical Specification CEN/TS 16429 "Stationary source emissions – Sampling and determination of hydrogen chloride content in ducts and stacks – Infrared analytical technique" deals with the following aspects:

- Specific components and requirements for the sampling system,
- Requirements for quality assurance and quality control.

2. Objectives



Mandate M/513 requires the drafting of one European Standard. This standard, which requires the development and validation of the test method, is subject to this call for tender.

- The experts will cooperate in the development and validation of the required test method described in CEN/TS 16429 “Stationary source emissions - Sampling and determination of hydrogen chloride content in ducts and stacks - Infrared analytical technique”.

The objectives of these validation tests are:

- To test the relevance of performance criteria,
- To select accurate measuring system (named “P-AMS” in this call for tender) which fulfil performance criteria,
- To obtain repeatability and reproducibility data,
- To give advice on the procedure and on the time necessary to have a good adjustment of the whole measuring system taking into account passivation of the materials used for the sampling line and analyser.

3. Execution

3.1 General

The execution of the mandate will be divided into several work packages. AFNOR will carry out the procedural work and sign the contracts with the selected subcontractors following authorization by EC.

The aim of this call for tender is to cover WP3, WP4 and WP5 of the mandate.

A first call for tender has been launched (WP 1 and WP 2) in September 2015. Once the implementation of WP2 is acted, WP3, WP4 and WP5 of the mandate are about to be developed.

3.2 Validation of the Measurement Systems on a test bench

Work Package 3 (WP3)

The aim of work is to validate the Measurement Systems on a test bench.

For each measurement system, the tests shall be implemented, by a technician of an accredited laboratory with the support of a technician from the manufacturer providing a selected P-AMS, to ensure that the provisions requirements associated to the sampling lines, to the quality controls... are respected.

⇒ On a test bench able to :

- install up to 8 measuring systems (two per model to provide repeatability data),
- to cover the whole range of HCl concentrations and matrices:

- ✓ waste incineration plants 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 (highest half-hourly limit mentioned in the IED is 60 mg/Nm³).
- possibility to study the influence of other gases (water vapour, NH₃),
- ⇒ and on two plants (waste incineration and combustion) with the 4 measuring systems (one for each type).

Note: an accredited laboratory will implement the EN 1911 measurements to check the comparability of chloride concentrations and HCl concentrations.

The WP 3 is divided in two Actions (3.1 and 3.2).

Action 3.1: Installation of the candidate measurement systems (P-AMS) on the bench by a technician of a competent laboratory with the support of a technician from the manufacturer providing a selected P-AMS.

Four manufacturers and four laboratories will be involved:

- Manufacturer task : provision of 2 measurement systems, Installation/adaptation to the bench/travel cost and check of the proper functioning (Maximum 4 manufacturers)
- Accredited Control laboratory task: training on one of the four P-AMS with the technician from the manufacturer dedicated to this P-AMS. (Maximum 4 laboratories)

Action 3.2: Performance of the tests (3 full days + 1 day for installation)

- a) **Action 3.2a** by the test bench owner: prepare and provide the appropriate gas matrices, coordinate the implementation of the tests
 - b) **Action 3.2b** by a technician of an accredited laboratory with the support of a technician from the manufacturer providing a selected P-AMS: each couple of P-AMS will be handled by both technicians => 8 technicians to be mobilized.
- The laboratory shall provide evidence of relevant experience on instrumental techniques including HCl (operation and adjustment procedures).

- Accredited Control laboratory task :

- For each P-AMS, adjust and check of drift, implementation of the leak test, collection of the data;
 - implement one manual method according to EN 1911 in parallel (a minimum of 5 parallel measurements per day during the campaign including daily collection efficiency and additional daily field blank);
 - provide a full data report, including procedural description for the manual method, used reference material, documentation of the P-AMS, quality control checks and data from the P-AMS (one minute average values, results of manual method, water values). The laboratory will provide the water vapour content concentration measured by the manual method (EN 14790) and if applicable, by the P-AMS.
- Manufacturer task: supply assistance to the accredited laboratory if necessary.

Maximum 4 manufacturers (presence of a technician during the test and travel cost)

Maximum 4 laboratories (presence of a technician, travel cost. implementation of the measurement systems and of the SRM, reporting of the results).

Deliverable: Interim progress report.

Report to CEN and the European Commission with conclusions from the validation of the measurement systems in a test bench.

Note 1: The laboratory contracting for WP3 may also contract for WP4. It will bring the reference material to adjust one P-AMS.

Note 2: The possibility for WP 3 selected candidate to contract for WP 4 has value only if the WP 3 outcomes are satisfactory. If it is not the case, the second ranked candidate for WP 3 will be called by the coordinator. In case of non-conformity with the WP3 outcomes or any serious malfunctioning of one of the P-AMS, the P-AMS will be replaced by another P-AMS candidate.

3.3 Validation of the Measurement Systems on 2 plants

Work package 4(WP4)

The aim of work is to validate the Measurement Systems on two plants.

Validations of the P-AMS (2 plants): for each P-AMS, the tests will be implemented, by a technician of an accredited laboratory with the support of a technician from the manufacturer providing a selected P-AMS, to ensure that the provisions requirements associated to the sampling lines, to the quality controls... are respected.

Action 4: Performance of the tests (3 full days + 1 day for installation) by a technician of the manufacturer of the analyser and a technician of an accredited laboratory for two measurement systems.

- Accredited Control laboratory task :
 - For each P-AMS, installation of the candidate measurement system on the duct, adjust and check the drift, implementation of the leak test, collection of the data,
 - For each P-AMS, implementation of one manual method according to EN 1911 in parallel (a minimum of 12 parallel measurements during the campaign including daily collection efficiency and additional daily field blank);
 - provide a full data report, including procedural description for the manual method, used reference material, documentation of the P-AMS, quality control checks and data from the P-AMS (one minute average values, results of manual method, water values). The laboratory will provide the water vapour content concentration measured by the manual method (EN 14790) and if applicable, by the P-AMS.
- Manufacturer task: supply assistance to the accredited laboratory if necessary.

Maximum 2 plants for 4 manufacturers – (provision of 1 measurement system, Installation /adaptation to the stack; travel cost and presence during the test)

Maximum 2 plants for 2 laboratories – (presence of a technician, implementation of the measurement systems and of the SRM, reporting of the results, installation cost of measuring devices)

Deliverables: four test reports prepared by the four control laboratories.

Note: The laboratories who will use FTIR will have to make additional QAQC checks under the Technical Specification elaborated by CEN/TC 264/WG 36.

3.4 Synthesis report of the field test

Work package 5(WP5)

The aim of work is to synthesize the measurement campaigns of the field test.

Collection of the measurement reports of the participants from the measurement campaigns (test bench + 2 field tests);

Preparation of synthesis reports of each measurement campaign (bench, site 1 and site 2), including:

- ✓ Description of the tests and statistical treatment of results (including repeatability and reproducibility data, estimate of the uncertainty of the method etc.);
- ✓ Provide information from the measurement reports related to:
 - Pros and cons of each measurement principle, performance characteristics, relevance of criteria;

- the implementation of the method on site;
- the adjustment procedure of the instrument.

Deliverable: The final report will consist of the complete results of the validation tests including the complete set of conclusions to CEN and EC including raw data and final results as well as the measurement reports provided by the accredited control laboratories.

Work package	Type	Task	Number of contracts
3	Validation of measurement systems on a test bench	See § 3.2	1
4	Validation of measurement systems on 2 plants	See § 3.3	1
5	Synthesis report	See § 3.4	1

Note: A contract will be signed for each Work package (WP 3, WP 4 and WP 5).

Total available budget for WP 3; WP4 and WP 5 = € 317.000,00

3.4 Time frame

The project shall be finalized until July 2018 (within 36 months after the Specific Grant Agreement was signed).

Action completed	Scheduled Date
Action completed	Scheduled date
Specifications of the Call for tender	S. + 01 month
Start first call for tender (WP 1 and WP 2)	S. + 03 months
Evaluation of responses to the first call for tender	S. + 07 months
Contracting for the 1st Call for tender (WP 1 and 2)	S. + 10 months
Selection of automatic measurement systems (WP 2)	S. + 13 months
Start second call for tender (WP 3, WP 4 and WP 5)	S. + 14 months
Evaluation of responses to the second call for tender	S. + 18 months
Contracting for the Call for tender (WP 3, 4 and 5)	S. + 21 months
Validation of the measurement systems on a test bench- (WP 2)	S. + 23 months
Interim Report (Report of the Validation Tests on a test bench)	S. + 24 months
Validation of the measurement systems in the field (1st plant)- (WP 4)	S. + 26 months
Validation of the measurement systems in the field (2nd plant)- (WP 4)	S. + 28 months
Synthesis of the results of the field tests (WP 5)	S. + 33 months
Final Report of the Validation Tests	S. + 36 months

Action completed	Scheduled date
Specifications of the call for tender (WP 1, 2, 3, 4, 5)	August 15
Start <u>first</u> call for tender (WP 1 and WP 2)	Oct 15

(minimum duration of the call for tender 35 days)*	
Evaluation of responses to the first call for tender	Jan 16
Contracting for the first call for tender (WP 1 and 2)	Feb. 16
Selection of automatic measurement systems (WP 2)	June 16
Start second call for tender (WP 3, WP 4, WP 5)	August 16
Evaluation of responses to the second call for tender	Oct 16
Contracting for the second call for tender (WP 3, 4, 5)	Dec 16
Validation of the measurement systems on a test bench (WP 3)	Feb 17
<i>Interim report (Report of the validation tests on a test bench)</i>	April 17
Validation of the measurement systems in the field (1 st plant) (WP 4)	June 17
Validation of the measurement systems in the field (2 nd plant) (WP 4)	Oct 17
Synthesis of the results of the field tests (WP 5)	March 18
<i>Final report of the Validation Tests</i>	June 18

4. Financial support

The European Commission and EFTA have decided to provide financial support to the test method validation and the standardization work. The financial support from the European Commission and EFTA is based on the Framework Partnership Agreement (FPA) 2014. Unless specified otherwise, and on condition of approval by EC and EFTA, costs of external subcontractors such as laboratories are generally funded at 100 %, with approx. 95 % being borne by EC and 5 % by EFTA. Costs have to qualify as eligible as defined in FPA 2014, be justified and accepted by EC/EFTA. The payment is usually divided into several instalments after completion of defined milestones and approval of the interim/final reports and the justification of costs. The subcontractors shall fulfil the conditions of the FPA 2014, including those relating to liability, ownership of results, confidentiality, conflict of interests, publicity, evaluation, assignment, checks and audits.

The payment of the verification work is divided into the following four parts

- Signature of contract 25 %;
- 1st interim report to European Commission 50 %;
- Final synthesis report 25 %.



The costs shall be justified with copies of the relevant invoices. All relevant evidence shall be kept in view of future payments (reports, work, drafts and deliverables, contracts & invoices, time sheets, tickets, boarding cards, hotel invoices, attendance lists with signatures, meeting agendas & reports, invoices for any consumables, purchase orders etc...)

Costs incurred before the Specific Grant Agreement was signed and the selection procedure is finalized will not be covered by financial support.

5. Selection criteria

The selection of contractors will be made on the basis of the following criteria (with weighting in percent), and considering the following weighting system:

- a total of 80% criteria relates to the technical aspects;
- a total of 20% criteria relates to the financial offer.

The selection panel shall select the candidate with the highest score. In the case of two or more candidates of equal qualification, the tender providing the best value for money shall be taken into consideration by the selection panel.

Scores from 0 to 4 are possible. Tenders scoring less than 70 % of the overall total points or less than 50 % of the points awarded for a single criterion will be excluded from the remaining assessment procedure.

1. Test bench owner-

The selection of contractors will be made on the basis of the following criteria (with weighting in percent):

- Description of the bench performances: generation system, matrices, level of HCl and associated generated interferences, homogeneity of the bench, type of device to know the generated concentrations and conformity to Annex A of EN 15267-4 (30%);

Note: As the publication of EN 15267-4 is planned on December 2016, an extract of the Annex A is presented below:

Annex A (normative)

Minimum requirements for a test bench

The generation mode of the testing bench should be able to provide matrices of gases and the relevant concentration levels with regard to the actual conditions encountered on industrial site and ELV. The gas shall be issued in the testing bench at levels of temperature and humidity corresponding to actual conditions. Indeed it should be recalled that the major source of uncertainty in an emission measurement method is the sampling part and that it shall be implemented in the conditions as close as possible to the conditions of site.

It is also necessary to ensure that the generation period is in line with the minimum sampling duration provided in the standards describing measurement methods;

Comparison of measuring devices shall be carried out at measurements points where the equivalence of the concentrations of the parameters to be measured has been demonstrated.

The body organizing the inter-comparisons of methods on its test bench shall have the necessary competence.

NOTE The test bench provider can demonstrate the necessary competence e.g. by accreditation on the basis of EN ISO/IEC 17043.

- Accreditation for the organisation of inter-laboratory campaigns according to ISO CEI 17043 and knowledge of ISO 13528 (25 %)
- Experience in CEN standardization in the field of emission measurements and active participation to CEN TC 264 WGs (10%);
The knowledge of the EN 1911 and TS 16429 will be appreciated
- Quality of the test programme (15%);

Note: the selected bench owner will have to adjust the programme with the selected expert of WP 5 in charge of the statistical data treatment and the Project leader (WP1).

2. P-AMS manufacturer

The selection of contractors will be made on the basis of the following criteria (with weighting in percent):

- Conformity to EN 15267-4 and TS 16429
- P-AMS easy to handle and to be adjusted

The performance should be described in the WP 2 report.

Note: As the publication of EN 15267-4 is planned on December 2016, an extract of the performance characteristics and performance criteria for gas monitoring P-AMS in laboratory tests is in the Table 1 below.

Table 1 — Performance criteria for gas monitoring P-AMS in laboratory tests

Performance characteristic	Performance criteria		Test in sub-clause
	Gases except O ₂	O ₂	
Response time	≤ 200 s ≤ 400 s for NH ₃ , HCl and HF	≤ 200 s	10.6
Repeatability standard deviation at zero point	≤ 2,0 % ^a	≤ 0,20 % ^b	10.7
Repeatability standard deviation at span point	≤ 2,0 % ^a	≤ 0,20 % ^b	10.8
Lack of fit	≤ 2,0 % ^a	≤ 0,30 % ^b	10.9
Short-term zero drift	≤ 2,0 % ^a	≤ 0,20 % ^b	10.10
Short-term span drift	≤ 2,0 % ^a	≤ 0,20 % ^b	10.10
Influence of ambient temperature change from 5 °C to 25 °C and from 40 °C to 20 °C at zero point	≤ 5,0 % ^a	≤ 0,50 % ^b	10.11
Influence of ambient temperature change from 5 °C to 25 °C and from 40 °C to 20 °C at span point	≤ 5,0 % ^a	≤ 0,50 % ^b	10.11
Influence of voltage, at -15 % below and at +10 % above nominal supply voltage ^c	≤ 2,0 % ^a	≤ 0,20 % ^b	10.12
Influence of vibration	≤ 2,0 % ^a	≤ 0,20 % ^b	10.13
Influence of sample gas pressure at span point, for a pressure change Δp of 3 kPa	≤ 2,0 % ^a	≤ 0,20 % ^b	10.14
Influence of sample gas flow on extractive P-AMS for a given specification by the manufacturer	≤ 2,0 % ^a	≤ 0,20 % ^b	10.15
Cross-sensitivity	≤ 4,0 % ^a	≤ 0,40 % ^b	10.16
Converter efficiency for P-AMS measuring NO _x	≥ 95,0 %	–	10.17

^a Percentage value as percentage of the upper limit of the certification range.
^b Percentage value as oxygen volume concentration (volume fraction).
^c If the manufacturer specifies different limits for battery operated P-AMS, these limits shall be applied.

3. Accredited control laboratory

The selection of contractors will be made on the basis of the following criteria (with weighting in percent):

- National accreditation in the area of emission measurements (40%);
- Active participation in CEN standardization in the field of emission measurements (25%);
- Knowledge of the EN 1911 and of CEN TS 16429 (15 %).

4. Laboratory for the synthesis report of the field tests

The selection of contractors will be made on the basis of the following criteria (with weighting in percent):



- Experience in CEN standardization in the field of emission measurements and active participation to CEN TC 264 WGs (30 %);
- Knowledge of ISO 5725-5 and ISO 17043 and ISO 13528 (50 %)

Note: the selected expert will have to adjust the programme on the test bench with the selected bench owner and with the Project leader (WP1) and to define the format of data that will have to be given by the control laboratories test reports.

6. Eligibility criteria

The following candidates will be excluded:

- candidates who were the subject of a non-likely judgment of recourse for a professional infringement;
- candidates who are in an irregular tax situation or in an irregular special taxation situation;
- candidates who provide erroneous information.

7. Tenders

Tenders shall be sent by mail to the secretary of CEN/TC 264/WG 3, Mrs Caroline LHUILLERY, as soon as possible, to be received **at the latest 22 September 2016**.

Tenderers must place each bid for each work package or role inside a sealed envelope clearly marked CONFIDENTIAL, placing the sealed envelope(s) in an envelope which is posted to the address indicated. The tender shall be in English and contain:

- Curriculum Vitae of each relevant person participating in the project, demonstrating the necessary expertise;
- accreditation certificate according to ISO/IEC 17025 or equivalent certificate demonstrating the competence on the subject;
- a schedule and a description of the execution of the tasks which will be carried out in the project;
- appropriate documentation to prove the economic and financial capacities;
- any further documents to prove the qualification required in the above Clauses on Selection and Award criteria;
- a signed declaration, by which the candidate(s) certifies not to be subject to one of the exclusion criteria as described in Clause "Eligibility Criteria" and the veracity of the adjoining documents.

Please note that, to grant equal treatment of all tenders, it is not possible to modify offers after their submission in relation to the technical and financial proposals. As a consequence, incompleteness in this section can only result in negative impact for the evaluation of award criteria. Please note also, that proposals deviating from the technical specifications may be rejected for non-conformity. Candidates shall indicate for which of the work packages and which role (network; laboratory; project coordinator; other) they intend to apply.



Candidates may apply for more than one work package/role. In case of multiple applications candidates shall state their priorities. For each application all bidding/application documents required shall be submitted in a separate sealed envelope clearly marked CONFIDENTIAL.

The selection and appointment of the networks, laboratories and the project coordinator will be conducted by a selection panel composed of the chairman and the secretary of CEN/TC 264, the secretary of CEN/TC 264/WG 3 and the representative for air quality of EC DG ENV.

The contracts with the selected networks, laboratories and the project coordinator will be signed following the signature of the contract between CEN and EC/EFTA and the authorisation of the selection by EC.

For additional information please contact the secretary of CEN/TC 264/WG 3, Mrs Caroline Lhuillery (01 41 62 86 63 – caroline.lhuillery@afnor.org).

If due to requests or other reasons supplementary information to this call for tender is required, this will be published on the website of the Commission on Air Pollution Prevention of AFNOR (www.afnor.org) and the website of CEN CENELEC Management Centre

Please send your application to:

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