

**INTERLABORATORY COMPARISONS
Year 2027****Ambient air****Plant protection products
(PPPs - Pesticides)**

Ineris - 236865 - 3059803 - v1.0

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**Organizer: Ineris – Environmental Characterisation and Impacts on
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1. CONTEXT

Plant protection products (pesticides) constitute a category of unregulated atmospheric pollutants. Their monitoring is included in several national and international programs, primarily dedicated to persistent organic pollutants (POPs). In contrast, data on current-use pesticides (CUPs) remain limited, as long-term monitoring networks are still poorly developed worldwide. Consequently, the available knowledge is largely based on short-term studies conducted within research projects.

In France, although pesticides are not regulated as air pollutants, they are monitored by the Approved Air Quality Monitoring Associations (AASQA), some of which have been conducting regional surveys since the early 2000s. In June 2018, pesticides were officially recognized as Pollutants of National Interest (PNI) within the French national air quality monitoring framework. At the same time, efforts were initiated to develop a structured national monitoring strategy, beginning with the National Exploratory Campaign for the measurement of Pesticide residues in air (CNEP) conducted in 2018-2019, followed by the implementation in July 2021 of a National Long-Term Monitoring Program (SPN). This program covers all metropolitan and overseas French regions through a network of 18 representative monitoring sites.

The sampling and analysis of pesticides in ambient air, whether present in the gaseous or particulate phase, are carried out in accordance with the French standard NF X 43-082¹, published in April 2026. This standard replaces the two experimental standards XP X 43-058² and XP X 43-059³ published in 2007. Within the framework of the SPN, the AASQA are responsible for conducting and supervising sampling operations, while the chemical analyses of the collected samples are performed by specialized contract laboratories.

In addition, Article 16 of the Decree of 16 April 2021 concerning the national ambient air quality monitoring system requires AASQA to ensure that laboratories performing chemical analyses on their behalf participate in the InterLaboratory Comparison (ILC) exercises recommended by the Central Air Quality Monitoring Laboratory (LCSQA).

In this context, Ineris, in collaboration with the French National Laboratory for Metrology and Testing (LNE), periodically organizes ILC exercises in the field of pesticide measurements in ambient air. Participation is voluntary, and these exercises are not intended as a laboratory approval or accreditation process.

They are open to all laboratories currently involved, or wishing to become involved, in the analysis of pesticides in ambient air. Their objective is to assess and strengthen the reliability of analytical results produced in this field by enabling participants to compare their performance with that of their peers and identify potential areas for improvement.

This document provides all the information required to register for this ILC exercise with full knowledge of the conditions and requirements.

¹ NF X 43-082 « Ambient air – Determination of crop protection substances (pesticides) in ambient air »

² XP X 43-058 « Ambient air – Determination of crop protection substances (Pesticides) in ambient air – Active sampling »

³ XP X 43-059 « Ambient air – Determination of crop protection substances (pesticides) in ambient air – Preparation of the collection media – Analysis by chromatographic methods »

It includes:

- the participation procedures,
- a description of 2027 ILC exercise.

2. OBJECTIVES

Participation in an ILC enables a laboratory to:

- compare its results against those obtained by other laboratories performing the same type of analysis;
- assess the competence of operators for a given analytical technique;
- evaluate a method for the determination of an analyte in a given matrix;
- meet the requirements of quality management standards;
- improve the quality of its measurements;
- demonstrate its competence in measuring an analyte in a specific medium, thereby helping to meet regulatory requirements for obtaining, for example, approval or accreditation.

Achievement of these objectives is generally assessed through a performance score (z-score), which enables the laboratory to evaluate the deviation of its results from a reference value established using robust statistical algorithms (cf. Annex 3).

For laboratories, this type of exercise helps identify **issues related to pesticide analysis across a range of concentration levels** on sampling media specific to both polar and non-polar organic pesticides, whether clean or associated with often complex matrices (i.e., sampling media exposed to ambient air and potentially contaminated). The ultimate objective is to ensure **the suitability and continuous improvement of analytical techniques** with respect to the sampling media employed, target compounds, and concentration levels encountered.

For the AASQA, this type of exercise promotes the comparability of data across the national monitoring network and provides a basis for estimating the method's expanded uncertainty from experimental data when a theoretical evaluation is not available.

3. LABORATORIES CONCERNED

This exercise is primarily intended for laboratories contracted by the AASQAs to perform pesticide analyses. It is also open to any French or international laboratory or organization carrying out the measurement and analysis of pesticides collected on foam adsorbents and filters used for ambient air sampling.

4. GENERAL TECHNICAL REQUIREMENTS

4.1. REGISTRATION PROCEDURE

Period for registration is set to:

21 September 2026 to 23 October 2026

on the following website:

<https://comparaisons-interlaboratoires.ineris.fr>

Upon first login, i.e. if the laboratory does not yet have an account, it must create one in order to access the platform's features. To do so, the laboratory will need the following information:

- company identification number (SIRET, DUNS, etc.);
- VAT Intra-community number (Europe only).

Once the account has been validated by Ineris, the laboratory will be able to register to the proposed ILC.

Online help is available on the website.

If the laboratory **already** has an account, it may proceed directly to the registration stage described below.

During the **registration phase**, the laboratory must provide the following :

- its company identification number (SIRET, DUNS, etc.);
- a **purchase order** issued by its organization.

Fifteen days after the registration closing date, a confirmation email is sent to the address provided when the account was created. This confirmation summarizes the interlaboratory comparisons for which the laboratory is registered and provides its confidential program identification number.

4.2. PRICE

The costs associated with the organization of the exercise and the evaluation of the results are covered by the LCSQA. A participation fee of 2 150 € (excluding VAT) is requested to cover the costs related to the preparation and the shipment of the Pesticides ILC test materials.

The participation fees are summarized below:

Title	Amount in € excluding tax	20% VAT	Amount in € all taxes included
26-236865-ILC Pesticides Ambient air	2 150	430	2 580

Invoicing and payment will be processed **upon shipment of the test materials**.

Credit card payments are not accepted.

The General Terms and Conditions of Sale are available on the website dedicated to the ILC organized by Ineris (DI-1075-AA).

4.3. INERIS COMMITMENTS

Ineris commits to ensure the confidentiality of information when reporting results online and to preserve anonymity when issuing the report by assigning each participant a unique and confidential identifier.

Ineris commits to preserve the confidentiality of each participant's identity by restricting access to the confidential code to a limited number of people involved in coordinating the proficiency testing scheme. However, confidential information, as defined in the general terms and conditions of sale and, where applicable, in the confidentiality agreement, may be disclosed:

- to auditors appointed by certification and accreditation bodies, or as part of an outsourced internal audit, who are themselves bound by confidentiality agreements. The customer's order constitutes consent to such disclosures;

- to an authority where the institute is legally required to do so.

Ineris commits to promptly inform participants of any changes to the design or operation of the proficiency testing programme.

Ineris commits to review any complaint and to take action where necessary in accordance with the provisions of § 5.3, "Interested Parties and Customer Feedback / Complaints", of the Quality Manual, available on the Ineris website at: www.ineris.fr.

4.4. COMMITMENTS OF PARTICIPANTS

At the time of registration, participants commit to:

- complete and return the "Receipt form" IM-0223;
- comply, for each parameter, with the method specified in Annex 1 and further detailed in the instruction form IM-1541;
- submit their results with complete integrity, without falsification or collusion;
 - In case of NON-COMPLIANCE, Ineris reserves the right not to take into account the data submitted by the participant concerned and will take the appropriate actions.
- submit their results in accordance with the prescribed schedule, except in the case of instrument failure reported before the deadline for result submission;
- provide the associated metadata as requested.

4.5. COMMUNICATION

All communications between Ineris and the participants are conducted primarily in electronic format. Ineris cannot be held liable for the non-receipt of an email. The laboratory's confidential identification number must be quoted in all correspondence with the coordinator.

All documents related to the ILC can be downloaded from the dedicated Ineris ILC website: <https://comparaisons-interlaboratoires.ineris.fr>.

5. ANNEXES

Annex No.	Title	Pages
1	Description of the test materials	7
2	General organization of an interlaboratory comparison	13
3	Statistical analysis and reporting of results	16

Annex No.1: Description of the test materials

All tests will be performed outside the scope of accreditation.

Test	Reference solution																																												
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Date of receipt	Between 18 and 24 January 2027	
Analytical standards	At the participant's choice	
Test materials	Tested matrices	Reference solution of non-polar organic substances Reference solution of polar organic substances
Concentration level	- Non-polar substances: mixture covering a concentration range of approximately 15 to 1,200 ng.mL⁻¹ for each substance. - Polar substances : concentrations ranging from 15 to 400 ng.mL⁻¹ for each substance.	
Sample characteristics	Tested matrices	For non-polar substances: Two 1 mL reference solutions, S1 and S2, are provided, each accompanied by a 1 mL backup vial. S1 contains 17 non-polar substances. S2 contains all or some of these substances, with neither the composition nor the concentration disclosed. For polar substances: Two 1 mL reference solutions, S3 and S4, are provided, each accompanied by a 1 mL backup vial. S3 contains the two polar substances at a low concentration, while S4 contains the same substances at a higher concentration.
Stabilization	No	
Refrigerated transport	Yes	
Number of measurements per sample	3 measurements per solution	
Specific metadata	Specific survey to gather information on the practices implemented by each laboratory.	
Statistical Treatment Applied to Test Materials – Tested Matrices	Assigned value	Robust mean and robust standard deviation, calculated using Algorithm A of NF ISO 13528.
	Performance	z-score or z'-score (which takes into account the standard uncertainty associated with the assigned value when it is not negligible and/or the heterogeneity of the material, as defined in our procedures), except when the number of results is fewer than 8 after exclusion of outliers or missing results. In such cases, the values are provided for information purposes only.
Monitoring of the Homogeneity and Stability of Test Materials	Organization	The monitoring of the homogeneity and stability of solution S1 will be carried out by the LNE, and that of solution S3 by Ineris.

Test	PUF foam																																							
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Analytical standards	At the participant's choice																																							
Test materials	Quality Assurance	PUF foam blank (clean virgin PUF foam cleaned by Ineris)																																						
	Tested matrices	Virgin foam (MV) Foam exposed to ambient air (ME)																																						

Concentration level	2 concentration levels per matrix	
Sample characteristics	Quality Assurance	3 unspiked virgin PUF foam samples used as foam blanks.
	Tested matrices	<u>For virgin foam (MV):</u> 3 PUF foam (MV) spiked with solution S1; MV1. <u>For foam exposed to ambient air (ME):</u> 3 PUF foam (ME) spiked with solution S1; ME1. 3 PUF foam (ME) spiked with solution S2; ME2.
Stabilization	No	
Refrigerated transport	Yes	
Number of measurements per sample	3 measurements per foam type (1 measurement per foam sample)	
Specific metadata	Specific survey to gather information on the practices implemented by each laboratory.	
Statistical Treatment Applied to Test Materials – Tested Matrices	Assigned value	Robust mean and robust standard deviation, calculated using Algorithm A of NF ISO 13528.
	Performance	z-score or z'-score (which takes into account the standard uncertainty associated with the assigned value when it is not negligible and/or the heterogeneity of the material, as defined in our procedures), except when the number of results is fewer than 8 after exclusion of outliers or missing results. In such cases, the values are provided for information purposes only.
Monitoring of the Homogeneity and Stability of Test Materials	Organization	The monitoring of the homogeneity and stability of MV1 and ME1 foam materials will be carried out by LNE.

Test	Filter																																												
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Analytical standards	At the participant's choice																																												

Test materials	Quality Assurance	No filter blank (filters pre-baked by Ineris).
	Tested matrices	Virgin filter (FV) Filter exposed to ambient air (FE)
Concentration level	2 concentration levels per matrix	
Sample characteristics	Tested matrices	For virgin filter (FV): 3 filters (FV) spiked with solution S1; FV1. 3 filters (FV) spiked with solution S3; FV3. 3 filters (FV) spiked with solution S4; FV4. For filter exposed to ambient air (FE): 3 filters (FE) spiked with solution S1; FE1. 3 filters (FE) spiked with solution S3; FE3.
Stabilization	No	
Refrigerated transport	Yes	
Number of measurements per sample	3 measurements per filter type (1 measurement per filter)	
Specific metadata	Specific survey to gather information on the practices implemented by each laboratory.	
Statistical Treatment Applied to Test Materials – Tested Matrices	Assigned value	Robust mean and robust standard deviation, calculated using Algorithm A of NF ISO 13528.
	Performance	z-score or z'-score (which takes into account the standard uncertainty associated with the assigned value when it is not negligible and/or the heterogeneity of the material, as defined in our procedures), except when the number of results is fewer than 8 after exclusion of outliers or missing results. In such cases, the values are provided for information purposes only.
Monitoring of the Homogeneity and Stability of Test Materials	Organization	The monitoring of the homogeneity and stability of the FV1 and FE1 filters will be carried out by LNE, and that of the FV3 and FE3 filters by Ineris.

Annex No. 2: General organization of an interlaboratory comparison

For each proficiency test, the sequence of events will be as follows:

- feasibility study, where necessary, to define the appropriate conditions for the future proficiency test;
- sampling, spiking where applicable, packaging, and dispatch of the test materials;
- shipment (d= 0) of the test materials to the various participants by Ineris;
- receipt by the participants (d = +1);
- **extraction** of the test materials by the participants (d = +1 to **+15 max**) and **analysis** (d = +1 to **+15 max** for **polar** substances and d = +1 to **+30 max** for **non-polar** substances); meanwhile, Ineris and LNE monitor the homogeneity and stability of the dispatched test materials;
- submission of results by the participants (d = +35 max) via the online platform: <https://comparaisons-interlaboratoires.ineris.fr>;
- data processing and statistical evaluation by Ineris;
- distribution of the final report, together with the satisfaction survey.

The overall organization of the interlaboratory comparison is as follows:

1. Feasibility study of the test

Each test material is subject to a feasibility study conducted over several weeks. However, if the homogeneity and stability of similar test materials (in terms of matrix and concentration level), prepared using the same procedures, have already been assessed in a previous study, the feasibility study will not be repeated.

2. Test announcement

Ineris informs the laboratories of the organization of a test by publishing an announcement on the dedicated website and notifying them by email.

3. Participant registration

Ineris receives registration requests and confirms the registration of each participant. A unique confidential identification number is then assigned to each participant.

The **instruction form IM-1541** is sent to participants before and/or at the time the test materials are dispatched, in order to inform them of the instructions to be followed (target substances, storage conditions applied, type of containers used, etc.) and the applicable deadlines. It is also made available online at: <https://comparaisons-interlaboratoires.ineris.fr>

4. Preparation of Test Materials

The test materials are prepared and packaged by Ineris and LNE in compliance with the requirements of the applicable official regulations. These requirements relate in particular to the nature of the matrix used, the concentration level and, above all, the preparation of the test materials to ensure their quality in terms of stability and homogeneity.

The test materials are shipped in packaging that must be returned to Ineris.

The packaging and its contents (ice packs and temperature logger) must be returned to Ineris within one week of receipt of the test materials. The return of the packaging and temperature logger is a prerequisite for the issuance of the reports. Transport and shipping costs are the responsibility of the participant.

Return address:

Ineris
For the attention of Boulos SAMIA
Parc technologique ALATA
BP 2
60550 Verneuil-en-Halatte

5. Shipment of Test Materials

The shipment of test materials is carried out by express delivery service. The quality of this service is monitored by Ineris.

The following documents will be enclosed with the test materials:

- **Acknowledgement of Receipt Form IM-0223:** upon receipt of the shipment, participants must complete and return this document to Ineris;
- Instruction Form IM-1541.

Test materials will preferably be dispatched at the beginning of the week to allow participants to initiate the analytical process before the end of the week.

Result submission forms are available on the website: <https://comparaisons-interlaboratoires.ineris.fr>.

Shipment of test materials to foreign countries and french overseas departments and regions (DROM) :

- Clear labeling of the package and preparation of a detailed pro forma invoice to emphasize the requirement to keep the samples refrigerated ($\leq 8^{\circ}\text{C}$);
- Shipment under refrigerated conditions to mitigate the effects of any delays, beyond our control, that could affect the test materials;
- Notification of participants by email of the date on which the package is handed over to the carrier, together with the tracking number, to enable shipment monitoring (carrier, customs clearance, delivery, etc.).

6. Receipt and analysis of test materials by the participant

Upon receipt and opening of the shipment, the participant shall:

- check the temperature of the consignment in the case of a refrigerated shipment and record the measured value on the acknowledgement of receipt form IM-0223;
- return the packaging, including all contents (ice packs and temperature logger), to Ineris in accordance with the return instructions provided above.
- inspect the condition of the shipment and promptly inform Ineris of its receipt and condition by returning the duly completed acknowledgement of receipt form IM-0223 by email;
- immediately implement the appropriate storage conditions.

The participant shall initiate the analytical process **using their own analytical methods**.

7. Monitoring of test materials by the organizer

Checks on the dispatched test materials will be carried out during the participants' analysis phase. Ineris and LNE will ensure that the test materials remain stable and homogeneous by performing repeatability tests on several samples throughout the analysis phase.

8. Submission of test results

Participants are given a limited period of time to perform the analyses and submit their results. This period is generally 4 weeks.

Results must be submitted by participants via the website <https://comparaisons-interlaboratoires.ineris.fr>.

To enter their results online, participants must log in to their personal account.

A questionnaire will be provided to participants. In such cases, result submission cannot be validated until the questionnaire has been completed.

Online guidance will be available to assist participants in using the result-entry software.

For reasons specific to their laboratory, participants may choose not to analyze one or more substances.

Incomplete analytical reports are accepted.

In all cases, the following results will not be taken into account in the statistical evaluation:

Results not considered for the statistical analysis are the following:

- values reported below the limit of quantification (LOQ)*;
- values entered as zero « 0 »;
- values for which an error in dilution or reporting in the required unit has been identified (for example, an error by a factor of 1000).

* The methodology applied will be as follows:

Reporting of 3 values

	Data received	Data taken into account
1st case	C, C, C	C, C, C
2nd case	C, C, <LQ	C, C
3rd case	C, <LQ, <LQ	None
4th case	<LQ, <LQ, <LQ	None

Annex No. 3: Statistical analysis and reporting of results**1. Statistical analysis**

The statistical analysis of the results is carried out by Ineris in accordance with the requirements of:

- EN ISO/CEI 17043 giving the guidelines for implementing proficiency tests,
- ISO 5725 series: « Accuracy (Trueness and Precision) of measurement methods and results »,
- ISO 13528: « Statistical Methods for Use in Proficiency Testing by Interlaboratory Comparisons ».

The determination of the assigned values depends on the type of test material used :

Test Materials « Reference solution », « PUF Foam » and « Filter » :

The assigned value will be based on the consensus of the results obtained by all participants in the proficiency test. It will be calculated using robust statistical methods.

The advantage of robust analysis is that the calculation of the assigned value (reference value), confidence intervals, and performance statistics is not affected by the data analyst's judgment.
Participants' results are therefore processed with complete impartiality and transparency.

However, where the participant population is insufficient ($n < 10$), the assigned value may be fixed, for example, at the spiking value.

The standard deviation σ_{pt} chosen for the assessment of suitability is equal to the robust standard deviation s^* . It is determined from the results of the participants by applying Algorithm A of standard ISO 13528. However, where regulatory or standard requirements exist regarding uncertainty, or where the participant population is insufficient ($n < 10$), σ_{pt} may be assigned as a fixed value.

Performance is evaluated using the z-score (or z'-score). This enables each participant to assess their performance relative to the assigned value.

In addition, the identification of questionable or outlying values is carried out using several statistical tests (Cochran's, Grubbs', and Mandel's tests). The purpose is to assist both the organizer and the participant, as part of a continuous improvement process, in investigating the causes that may have led to such results. The organizer reserves the right to report only the results of selected tests to participants, as some tests serve the same purpose.

2. Reporting results

The results of the proficiency test will be reported in two stages:

- Issue of a preliminary test report, approximately two months after the deadline for online result submission. This report will compile the raw results of all participants, the mean, the repeatability standard deviation, the repeatability coefficient of variation, and the performance of each participant for each parameter and each test material. At this stage, no detailed analysis of the data is performed. This preliminary report provides participants with an initial overview of the test results.

The preliminary test report will be sent exclusively to participants.

- Issue of the final test report, three months after the distribution of the preliminary test report. The information provided covers several aspects and, for each test material, includes:
 - values excluded from the dataset;
 - raw results: mean and standard deviation before statistical processing;
 - reference mean and standard deviation after statistical processing;
 - distribution curve of the mean values obtained by all participants;
 - a histogram displaying, where relevant, the performance of laboratories (z-scores) on a single graph;
 - z-score performance evaluation;
 - results of Cochran's test (within-laboratory variability) and Grubbs' test (trueness), where relevant;
 - Mandel's h (trueness) and Mandel's k (within-laboratory variability) consistency statistics, where relevant;
 - general and individual comments and interpretations.

The final test report is **public**, while ensuring the anonymity of participants. It will be sent to:

- the Central Laboratory for Air Quality Monitoring (LCSQA);
- the participants.

It will also be made freely available on the website: <https://comparaisons-interlaboratoires.ineris.fr>.

A satisfaction survey will be sent at the time the final test report is issued.

A meeting with participants may be organized to present the test results and facilitate the exchange of information.

Please note:

Any decision regarding formal recognition (accreditation) or legal recognition (approval/authorization) based on the results falls within the responsibility of the body granting such recognition, namely COFRAC for accreditation and the French Ministry responsible for Ecology for regulatory approval.