

INTERLABORATORY COMPARISONS
*Year 2026***Indoor Air**
**“BTEX and
Formaldehyde”**

Ineris - 235054 - 3018107 - v1.0

Organizer: Ineris - *Environmental Characterisation and Impacts on
Human and Biodiversity Department*

Function	First and last Name	Contact details	
		email	Phone
Head of the unit “Support for the monitoring air quality and surface water”	Caroline MARCHAND	Caroline.marchand@ineris.fr	+33 (0)3.44.55.63.24
ILC coordinator in the unit “Support for the monitoring air quality and surface water	Benedicte LEPOT	Benedicte.lepot@ineris.fr	+33 (0)3.44.55.68.14
Test material preparer, ILC coordinator in mentoring in the unit “Support for the monitoring air quality and surface water	Julien RENOUX	Julien.renoux@ineris.fr	+33 (0)3.44.55.69.66

Ineris - Parc technologique Alata – PO Box 2- F-60550 Verneuil-en-Halatte

☎ +33 (0)3.44.55.66.77 Internet: www.ineris.fr**Accreditation No. 1-2291, ILC, Scope available on www.cofrac.fr**

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1. CONTEXT

This ILC is open to the foreign laboratories which apply corresponding standards and responds to the needs of the French laboratories. The law on the national commitment to the environment has made it compulsory to monitor indoor air quality in certain establishments receiving a sensitive public (articles L. 221-8 and R. 221-30 et seq. of the French environment code). The establishments concerned are the welcoming children:

- establishments for collective reception of children under the age of six (day nurseries and kindergartens);
- recreation centers (outside school for minors);
- middle school and high school, nursery schools, elementary schools as well as general.

In this context, Ineris will organize in February-Mars 2026 an interlaboratory comparison according to the EN ISO/IEC 17043 standard requirements for formaldehyde and benzene. Toluene*, ethylbenzene*, m+p-xylene*, o-xylene* (T*E*X*) passive measurements will be added to benzene, out of accreditation (and so identified with a * symbol).

This document contains all the information necessary for fully informed registration in the Proficiency Test (PT).

It contains:

- the participation procedures;
- the description of the inter-laboratory comparison - program for 2026.

2. OBJECTIVES

An ILC participation gives the opportunity to the laboratories:

- to compare its results with those of other laboratories carrying out same type of analysis;
- to assess skills of the operators for a given technique;
- to evaluate their analytical (quantification) procedure for a given matrix;
- to meet the requirements of quality references;
- to improve its measurement quality;
- to demonstrate its measurement proficiency in a given environment in order to meet the regulatory requirements to obtain, for an example, an approval or an accreditation.

The achievement of these objectives is evaluated with a performance score (z-score) allowing participants to estimate the accuracy of their results from an assigned value known as reference value, calculated by proven statistical algorithms.(cf Annex 3)

This interlaboratory comparison will be carried out under an accreditation (accreditation No. 1-2291 - scope available at www.cofrac.fr) with the exception of the parameters identified by the symbol * and supplemented by the words "outside scope of accreditation" whenever possible.

List of parameters outside scope of accreditation: toluene, ethylbenzene*, m+p-xylene*, o-xylene* .*

3. LABORATORIES CONCERNED

This test is firstly intended for French accredited laboratories or for laboratories wishing to apply for benzene or formaldehyde monitoring in indoor air accreditation. The other laboratories which applied corresponding standards for the analyze of benzene and formaldehyde will be accepted. Toluene*, ethylbenzene*, m-and p-xylene*, o-xylene* will be added to benzene, out of accreditation.

Due to technical limitations, the number of participants is capped at 29 per test. Allocation of labs will be done on a first come first serve basis with an equal number of labs per test.

4. GENERAL TECHNICAL REQUIREMENTS

4.1. REGISTRATION PROCEDURE

Period for registration is set to:

05 February to 27 February 2026

on the following website:

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

For the **first connection**, i.e without account already existing, the laboratory shall create its account for accessing to website utilities. For that, the laboratory shall have the information below:

- enterprise identification (SIRET, DUNS,...),
- VAT Intra-community number (Europe only).

After validation 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 can access directly to the registration step below.

During the registration phase, the laboratory shall have the information below:

- enterprise identification (SIRET, DUNS,...),
- an order from their internal services addressed to Ineris.

Please note: The BIPEA quote and the form available on the website are not accepted as valid orders. Without a valid order, report will not be provided to the participant.

A confirmation will be sent to the participant 15 days after the end of registration with his lab identification.

4.2. PRICE

Test	Amount in € excluding tax	20% VAT	Amount in € all taxes included
BT*E*X*	1495	299	1794
Formaldehyde	1465	293	1758

Invoices and payment will be established **when sending samples.**

Payment by credit card is not accepted.

The general terms and conditions of sale are available on the website of the CILs organised by Ineris (DI-1075-AA).

4.3. INERIS COMMITMENTS

Ineris commits to abide by the EN ISO/CEI 17043 standard during the organization of the ILC.

Ineris commits to abide by the technical requirements of EN ISO/CEI 17073 standard during the organization of this (these) ILC.

Ineris commits to ensure information confidentiality in the online result submissions and anonymity in the result report by assigning a confidential code to each participant.

Ineris commits to protect participant identity confidentiality by only giving access to the confidential code to a limited number of people within the coordination group.

Ineris commits to notify all participants of any amendment to the ILC schedule and rules as soon as possible.

Confidential information, defined in the general terms and conditions of sale, and where applicable, by the confidentiality agreement, may be communicated to:

- the auditors commissioned by the certifying and accrediting bodies or in the context of an outsourced internal audit, which is themselves subject to a confidentiality agreement. The customer's order constitutes agreement to carry out these communications;
- an authority if the institute is required to do so by law.

Ineris commits to take into consideration any claim in accordance with the provisions of the Quality Manual (§5.3: 'Stakeholders and listening to customers / Claims') available on the Ineris website at the following address: www.Ineris.fr.

4.4. COMMITMENTS OF PARTICIPANTS

Once registered, all participants commit to:

- Fill and return the "Return form" IM-0223 as soon as reception;
- Comply for each parameter of the standard procedures outlined in Annex 1 and Form IM-1541;
- Submit the results in full integrity without falsification nor collusion;
 - In case of **NON-COMPLIANCE**, Ineris reserves the right to disqualify the participant and to take appropriate action.

- Submit all the results on time, except in the case of instrumental troubleshooting which shall be reported prior to the result submission deadline;
- Supply all related metadata upon request.

4.5. COMMUNICATION

Correspondence between Ineris and the participants should be mainly done electronically. Ineris rejects any responsibility in case of undelivered emails. The confidential code must be specified for further correspondence with the coordinator.

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

5. ANNEXES

Annex No.	Title
1	Description of the tests
2	General organization of Proficiency Test
3	Statistical processing and restitution of test

Annex No.1: Description of the tests

* the following tests will not be carried out under our accreditation

Family / Program / Agreement	ILC Indoor Air	
Substances / Parameters to be analyzed	Benzene, Toluene*, Ethylbenzene*, m-and p-xylene*, o-xylene* (BT*E*X*) Formaldehyde	
Date of receipt	Formaldehyde: 10 to 13 march 2026 Benzene, Toluene*, Ethylbenzene*, m-et p-xylene*, o-xylene* (BT*E*X*): 31 March to 03 April 2026	
Analytical standards	Benzene, Toluene*, Ethylbenzene*, m-et p-xylene*, o-xylene* (BT*E*X*): EN 16017-2 Formaldehyde: ISO 16000-4	
Test material	Quality assurance	Tubes blank: <ul style="list-style-type: none"> - 1 Radiello® 145 for BT*E*X* - 1 Radiello® 165 for formaldehyde
	Tested matrices / Sampling medium	<ul style="list-style-type: none"> - 2 passive Radiello® 145 tubes for benzene, toluene*, ethylbenzene*, m- and p-xylene*, o-xylene* (BT*E*X*) - 2 passive Radiello® 165 tubes for formaldehyde
Concentration level	One level per substances 'family or per substance	
Stabilization	None	
Refrigerated transport	Samples need to be kept refrigerated prior to analysis Allow to reach room temperature before analysis	
Number of measures per tube	One per tube	
Statistical processing implemented for test material – tested matrices	Assigned value	BT*E*X* and Formaldehyde: Robust mean Benzene: Standard deviation for the evaluation σ_{pt} chosen with ILCs experiment has been fixed to 25% T*E*X* and formaldehyde: Standard deviation for the evaluation σ_{pt} calculated with participants results
	Performance	z- score or z'-score (with uncertainty or/and heterogeneity material)
Statistical processing implemented for test material – quality assurance	Blank	Study for LoQ, quantified values, no quantified values.
Monitoring of the homogeneity and the stability	Organization	Benzene, toluene*, ethylbenzene*, m-and p-xylene*, o-xylene* (BT*E*X*): Ineris or another accredited laboratory according to ISO/IEC 17025 to parameter and matrix Formaldehyde: Ineris or another accredited laboratory according to ISO/IEC 17025 to parameter and matrix.

Annex No. 2: General organization of an interlaboratory comparison

The typical ILC schedule is specified below.

- ILC feasibility study (in order to define and assess outline of the optimal test conditions);
- Sampling, sample fortification if required; sample packaging,
- Sending (d = 0) of the test materials to the participants.
- Receipt of the test materials by the participants (d = +1);
- Analysis of the test materials by the participants (d = +1 to +14); and checking by Ineris of the test material homogeneity and stability all along the ILC, if necessary;
- Result submissions by the participants at <https://comparaisons-interlaboratoires.ineris.fr>;
- Data processing and statistical analysis performed by Ineris;
- Sending of the final report including a satisfaction survey form.

The general organization of the interlaboratory comparison is as follows:

1. Feasibility study of the test

Each test material undergoes a feasibility study over several weeks. However, if the homogeneity and stability have been the subject of a previous study on similar test materials (matrix, concentration level) and prepared following the same procedures, the feasibility study will not be renewed.

2. Test announcement

Ineris informs the laboratories of the organization of a test by transmitting the Annual Program and publishing information on the website.

3. Participant registration

Ineris receives the registration request and confirms the registration of the participant by email and provides its laboratory identification.

The instruction form IM1541 is forwarded to participants prior to, or with, the test materials in order to provide instructions (compounds to quantify, storage, handling, etc...) and deadlines. The form is also available at <https://comparaisons-interlaboratoires.ineris.fr>

4. Test material preparation

Test materials are prepared and packaged by Ineris in compliance with official guidelines. Such guidelines deal especially with the nature of the matrices, the concentration levels and the test material preparation in order to assure their quality in terms of stability and homogeneity.

Sending of the test materials is performed by Ineris. Test materials are sent in packaging that must be returned to Ineris, along with the temperature probe and the Radiello® 145 tubes.

5. Sending of the test materials

The test materials are sent by express delivery post. The delivery quality is monitored by Ineris.

The following documents are included in the package:

- Receipt acknowledgements (form IM-0223). Upon receipt of the package, participants are required to send it back to Ineris fully completed;
- Instruction form IM-1541 to Ineris;

Test materials are preferentially shipped at the beginning of the week in order to allow the participants to start the analytical process before the end of the week.

All the forms are available at <https://comparaisons-interlaboratoires.ineris.fr>.

Shipping of test materials to foreign and overseas:

- Visible labeling of the package and detailed proforma invoice to emphasize the need to keep the samples refrigerated (<7°C);
- Shipment of the package in refrigerated conditions to compensate for the effects of any delays, independent of our organisation, on our materials;
- Communication to participants by e-mail of the date on which the package was taken over by the carrier and the tracking number for tracking the package (carrier, customs, delivery, etc.).

6. Receipt and analysis of test materials

Upon opening of the package, participants shall:

- Perform a temperature control check and write the results on the receipt form IM-0223;
- Returning the envelope containing temperature recorder to Ineris;
- Inspect the package as well as its contents and write any relevant information on the receipt form IM-0223;
- Put the test materials in appropriate storage conditions immediately;

Participants shall start the analysis of the test materials as soon as possible.

7. Checking of the test materials

Controls on test materials sent will be performed during the analysis phase by the participants. Ineris will ensure that the test materials are stable and homogeneous by performing repeatability tests on several samples during the analysis phase, i.e a minimum of 10 analyzes of all substances.

8. Data Submission

The usual time period for the participants to achieve the analyses and submit their results is of 4 weeks.

The results will be sent by the participant using the <https://comparaisons-interlaboratoires.ineris.fr> site with its personal account.

The technical support is available online in order to help the participants to use the website for result submissions.

Incomplete results may be accepted if a participant, for specific reasons, is not able to analyze one or several compounds.

Results not considered for the statistical analysis are the following:

- values below the limit of quantification "<LoQ";*
- values entered as zero "0";
- values for which a systematic error (errors of dilution or unit of measurement) is identified (for instance by a factor 1000).

* The methodology will be as follows:

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

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

Statistical processing of the results shall be 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 assigned value will be based on the consensus of the results of the entire population participating in the test. It will be calculated using robust statistical methods.

The advantage of the robust analysis is that the calculations of the assigned value (reference value), the confidence intervals and the performance statistics are not affected by the judgment of the data analyst. The results are studied and treated with objectivity.

Nevertheless, in the case of an insufficient population size (<10), the assigned value can be set as, for example, equal to 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, if regulatory or normative requirements exist regarding uncertainty or when the population size is too reduced (<10), σ_{pt} may be set.

For the benzene, the standard deviation σ_{pt} has been fixed to 25%.

When test materials prepared from real matrices representative of the environment are implemented during the test, the evaluation of the performance will be performed using the z (or z') score. Thus, each participant will be able to position itself relative to the assigned value.

Furthermore, the research of suspect values and outliers will be realized with statistical tests of Cochran, Grubbs and Mandel. The aim is to help the organizer and the participant to identify the problem (repeatability, trueness). The organizer reserves the right to return only the results of certain tests to participants, as some of them have the same objective.

2. Restitution of the results

- Final test report, two months after the closing date of entry of the results online. It will describe the conducting of the test and the results of statistical processing of data submitted by participants. This report will contain:
 - values discarded from data set,
 - raw data,
 - means, standard deviation after statistical treatment,
 - z score with a repartition graph,
 - a distribution curve of the average with standard deviation of repeatability of all participants,

- the results of Cochran and Grubbs tests,
- General and individual advices.

The final test report is **restricted**. It will be sent to:

- the participants and / or available at <https://comparaisons-interlaboratoires.ineris.fr> via their personal space,
- COFRAC, as specified in Article 6 of the Order of 1 June 2016 on the procedures for monitoring indoor air quality in certain establishments open to the public (amended by the Order of 27 December 2022).

A satisfaction survey will be sent at the time of sending the final test report.