

# Air Inter-Laboratory Comparisons (ILC): sampling and analyses

For more than 25 years, Ineris has been organising Inter-Laboratory Comparisons (ILC) to improve sampling and analysis practices in the field of air: stack emissions, indoor air and now workplace air. Inter-Laboratory Comparisons are a key tool of quality control and participation in these comparisons is necessary for accredited laboratories.

#### **Automatic samplings and analyses**

- Compare sampling practices :
- test the conformity of materials and practices
- identify results dispersion sources
- propose improvements to benchmarks.
- Estimate individual and collective performance level of participants.
- Demonstrate the equivalence of an alternative measurement method to a reference method (EN 14793): implemented upon request.

# Stack emissions into the atmosphere

- Capacity to accommodate 12 participants simultaneously.
- Real matrices: atmospheres generated from combustion gas (natural gas, light fuel-oil or biomass), with or without dust, that can be heated, moistened or spiked with various pollutants.

# ILC in the testing bench:

- Evaluation of automatic methods (on-line):
   NO<sub>x</sub>, CO, CO<sub>2</sub>, O<sub>2</sub>, CH<sub>4</sub>, total COV, non-methane COV.
- Evaluation of manual methods (sampling): total dust, HCl, NH<sub>3</sub>, SO<sub>2</sub>, humidity.

#### **Analyses**

- Improve the quality of analytical method implementation.
- Allow participants to judge the accuracy of their results in relation to reference values or assigned values and evaluate their repeatability.
- Obtain a satisfactory comparability of results coming from different laboratories responsible for monitoring releases into air.





Testing bench

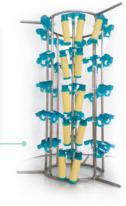
# **Analytical ILC:**

- HCl, NH<sub>3</sub>, SO<sub>2</sub>, HF, HAP, metals,
- Gas and particle phase: absorption solution, filters, resins,... exposed to combustion gases produced in the testing bench.
- Dust by gravimetry\*

# Indoor air



Exposure chamber



# **Analytical ILC** (diffusive sampling supports):

- Formaldehyde BTEX (benzene, toluene\*, ethylbenzene\*, xylene\*)
- Preparation of testing materials in an exposure chamber to simulate a real matrix.
- Atmospheres generated in controlled environmental conditions.
- Exposure concentrations close to indoor air quide values.

\* Not accredited parameters



Rack for diffusive sampling supports



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# Workplace air:

 Concentration levels between 1 and 100% of OEL (French Occupational Exposure Levels)

### **Analytical ILC:**

- Metals (Cd, Cr, Cu, Ni, Pb) Mercury
- Inorganic acids (HF, HBr, HCl, H<sub>3</sub>PO<sub>4</sub>, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>)
- BTEX (benzene, toluene, ethyl benzene, m-xylene)
- Acetaldehyde, formaldehyde
- Methanol



Analysis Jahoratory

Matrix	Programme	Fee	Date
Stack emission <b>Analyses</b>	Dust by gravimetry*	258 € BT	May 2022
	Gaseous hydrochloric acid (absorption solution subjected to gaseous effluents)	619 € BT	May 2022
	<b>Gaseous hydrofluoric acid</b> (absorption solution subjected to gaseous effluents) and particles (filter and dust)	1.086 € BT	May 2022
	<b>Gaseous metals</b> (absorption solution subjected to gaseous effluents) and particles (filter and dust): As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn	1.850 € BT	May 2022
	<b>Polycyclic Aromatic Hydrocarbons</b> (filter and dust): Benzo[a]anthracene, Benzo[k]fluoranthene, Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenzo[a,h]anthracene, Benzo[g,h,i]perylene, Fluoranthene, Indeno[1,2,3-c,d]pyrene	845 € BT	May 2022
	Gaseous sulphur dioxide (absorption solution subjected to gaseous effluents)	619 € BT	May 2022
	Gaseous ammonia (absorption solution subjected to gaseous effluents)	619 € BT	May 2022
Stack emission <b>Sampling</b>	Evaluation of manual measurement methods	Consult us	June 2022
Workplace air <b>Analyses</b> *	Mercury on Hydrar® tube	313 € BT	March 2022
	<b>Metals</b> (Cd, Cr, Cu, Ni, Pb) on quartz fibre filter	640 € BT	March & Sept. 2022
	<b>Inorganic acids</b> (HF, HBr, HCl, H <sub>3</sub> PO <sub>4</sub> , HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> ) on quartz fibre filter	678 € BT	March & Sept. 2022
	BTEX (benzene, toluene, ethyl benzene, m-xylene) on activated carbon support	765 € BT	March & Sept. 2022
	<b>Aldehydes</b> (formaldehyde, acetaldehyde) on silica tubes coated with 2,4-dinitrophenylhydrazine	895 € BT	March & Sept. 2022
	Methanol (silica gel support)	463 € BT	Sept. 2022
Indoor air Analyses	<b>BTEX</b> (benzene, toluene*, ethylbenzene*, xylene*) sampled on diffusive sampling tubes spiked by exposure to atmospheres generated in exposure chamber	1.275 € BT	May 2022
	<b>Formaldehyde</b> sampled on diffusive sampling tubes spiked by exposure to atmospheres generated in exposure chamber	1.200 € BT	June 2022
Ambient air Analyses*	<b>PAH</b> (Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[j]fluoranthene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Indeno[1,2,3,c-d]pyrene) on filters	1.635 € BT	Sept. 2022

<sup>\*</sup> Not accredited parameters

The documents relating to the test can be downloaded from the Ineris site under the tab:

https://comparaisons-interlaboratoires.ineris.fr

Ineris's accreditation for ILC organisation can be found at: http://www.cofrac.fr COFRAC Certificate n°1-2291.

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