eurofins | Lancaster Laboratories Environmental



Vapor and Air Analysis

Eurofins Lancaster Laboratories Environmental offers clients the confidence to make important decisions regarding air data and the expertise and experience to address all air testing needs. Our multiple systems provide analysis using TO-15 Full Scan, TO-15 SIM, TO-14 for Volatiles in Air by GC/MS and TO-13 for Semivolatiles in Air by GC/MS.

Why Choose Eurofins Lancaster Laboratories Environmental?

- As a pioneer in air analysis, we have been providing volatiles in air analysis to our clients for more than 20 years with the implementation of our first TO-14 analysis in 1992.
- We offer a number of methods appropriate for air analysis and have specialized equipment to meet the low limits often specified for indoor air analysis.
- We are certified for air analysis by EPA Method TO-15 in eight states that offer the certification, including New Jersey. Most states do not offer air accreditation.
- We offer the highest level of data quality available in the industry and provide certification to the method detection limit (MDL) for our Summa canisters.
- Through use of an advanced Summa canister cleaning system that decreases the time necessary to clean, certify and ship a Summa canister, we can quickly fill our clients requests.

Why is Air Analysis Important to You?

The EPA published guidance in the *Federal Register* (FRL-7414-4 11/29/02) detailing how to screen sites to determine if a vapor intrusion pathway exists and if so whether or not a sensitive receptor may be affected. More than 30 states have some type of vapor intrusion policies in place, and states are re-evaluating sites with No Further Action (NFA) letters to determine if vapor intrusion concerns exist.

Evaluating the risk of vapor intrusion begins with inputting site-specific data into a site conceptual model

(SCM) to determine if the migration of vapors from a contamination source may reach a receptor.

Key factors of the SCM include:

- Nature and extent of the source
- J&E Vapor Model (USEPA 2.3)
- Potential exposure pathways
- Potential receptors

There are situations where the conditions of a site logically do not support that a receptor will be affected (e.g., concentrations are low, source is reasonable distance from receptor, modeling shows receptor not at risk). In other situations, there is overwhelming evidence to suggest a receptor may be affected, and sampling will be needed (e.g., free product, high concentrations, source too close to receptor).

Types of Samples

There are several types of samples that can be collected to evaluate a potential indoor air concern. Samples can be collected in the building or residence and direct indoor vapors measured. They can be collected using a subslab probe or through the collection of soil gas monitoring points installed outside the structure.

In addition, ambient air, duplicates and blanks may be collected and analyzed. Each sample type can provide meaningful data in the evaluation of migrating vapors, and each presents their own set of challenges.

Indoor air samples may provide you the most accurate assessment of the vapors indoors, but it is the most intrusive and will monitor for not only any vapors migrating through the subsurface as well as detect all vapors in the home.

Sources such as fuel oil tanks, gas cans, moth balls, smoking, dry-cleaned garments, carpet adhesive and typical household supplies can all affect the results of an indoor air sample.

Subslab and soil vapor samples on the other hand collect a true vapor sample representative of subsurface conditions. The challenges with soil vapor samples include the use of heavy equipment, proper well construction, appropriate flow rates and proper sample collection techniques. In addition, when evaluating soil vapor data, the appropriate attenuation factor must be applied based on sample location and soil type.

Sample Analysis

We have provided the environmental community with air analysis from Summa canisters since 1992 and provide clients with the data quality and expertise needed to make important decisions based on our data. We have three GC/MS instruments dedicated to our Air Group providing TO-15, TO-15 SIM and TO-14 analysis.

We currently have more than 400 Summa canisters and offers calibrated flow controllers set from 20 minutes to 24 hours, filters and visual pressure gauges. Our primary stock of cans are 6 Liter. We also offer 1-Liter cans. The standard analysis holding time for a Summa can is 30 days from collection.

We hold several state certifications, including Florida, Louisiana, New York, New Jersey, Oregon and NELAP. And our analytical data can be provided in whatever units meet your needs. Either ppb(v) or µg/m^3 can be provided, or we can report data in both units on your analysis reports.

Analyses we offer:

TO-15 – Designed to detect volatile compounds at 1 ppbv and higher. Common Limits of Quanitiation (LOQs) are in the 1-2 ppbv range and Method Detection Limits (MDLs) are in the 0.2 to 0.5 ppbv range. This is the most recent published air method and includes a 5-level calibration and more stringent quality control parameters than its predecessor TO-14.

TO-15 SIM (Selected Ion Mode) – Primarily used in the analysis of samples collected at indoor air locations. It provides the most sensitivity and lowest reporting limits with MDLs in the 0.006-0.025 ppbv range and LOQs equal to 0.05 ppbv.

TO-14 – Designed for higher VOC concentrations with a 3-level calibration range from 10 to 100 ppb. Commonly used for soil vapor samples, this is an older version. Most regulatory agencies have moved to TO-15 as the method of choice.

TO-13A (Modified – Low Flow) – Analysis for semivolatile PAH compounds using GC/MS. Samples are collected using sorbent tubes with XAD resin, submitted to the lab, extracted and then analyzed using GC/MS technology.

Lab reporting limits are directly dependant on the amount of sample volume collected onto the sampling tube.

TICs/Library Search – Tentatively Identified Compounds (non-target compounds) can be searched, identified and semi-quantitatively reported when samples are analyzed using a standard full scan TO method, including TO-15, TO-14 or TO-13

EPA 18/25 – Gas Chromatography (GC/FID/PID) analysis for BTEX, methane and lightweight hydrocarbon fractions. Samples are collected into Tedlar bags or Summa cans from O&M systems and submitted to the lab for analysis. This is a quick inexpensive way to monitor your systems efficiency at higher concentrations.

Tracer Gases – A tracer gas (helium, tetrafluoroethane, isopropanol, 1,2-difluoroethane, butane, propane, etc.) is often used in a shroud in the field to monitor potential leaks in your sampling train. We provide analysis of many of these compounds.

Fixed Gases – Methane, CO_2, O_2 analysis can be indicators of natural attenuation.

Sampling Equipment, Preparation and Handling

Summa canisters prepared at Eurofins Lancaster Laboratories Environmental can be individually certified to our method detection limit. Whether by full scan or by SIM, we'll certify it clean before you receive it in the field. Each can is tracked through the use of unique can identification tags.

Our Summa can certification process starts with the cleaning process, which includes the repeated filling and evacuation of humidified nitrogen through three, heated cycles and three, non-heated cycles. Upon completion of our cleaning, we certify that the can maintains its pressure by filling the can with 30 psi and letting it sit for 24 hours. We then measure the pressure in the can to confirm the pressure is within 10 percent of its original pressure. Each can is then analyzed exactly like a field sample on the GC/MS, and all target compounds must be less than our method detection limit (MDL) for our can to be certifed. After our cans are certified, we evacuate them to negative 30 inches of mercury, and they are ready for the field. Flow controllers are also cleaned and certified using a similar process.

The flow control valves are set up on the Summa cans to collect approximately 5 Liters of sample in a 6-Liter can. This ensures a consistent vacuum during your entire field collection event. We also install vacuum gauges to monitor the sampling process. Filters are provided on the flow controller to ensure no unwanted dust or particles affect the performance of the flow contoller and disrupt the integrity of the sample.

All cans received from the field are confirmed for their pressure and must read a detectable vacuum. If no vacuum exists or if the vacuum is less than negative 10 inches of mercury, you will be notified immediately to determine if you would like to proceed with analysis.

We also provide certified XAD resin tubes used for low flow TO-13A analysis for PAHs and Tedlar bags for your sample collection needs.

Here are some things to consider before you leave for the field:

- Analytical methodology (compound lists and reporting limits needed)
- Sample type (indoor air, subslab, soil gas or ambient)
- Spacial variables (soil type)
- Temporal variables (wind, temperature, humidity)
- Preferential pathways
- Attenuation factor α = [indoor air] \ [soil gas]

Standard Target Compounds

1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,2-Dibromoethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Butadiene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2-Butanone (Methyl Ethyl Ketone)
2-Hexanone
3-Chloropropene (Allyl Chloride)
4-Ethyltoluene
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)
Acetone
Benzene
Bromobenzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon Disulfide
Carbon Tetrachloride
Chlorobenzene
Chlorodifluoromethane
Chloroethane
Chloroform
Chloromethane
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
Cumene (Isopropylbenzene)
Dibromochloromethane
Dibromomethane
Dichlorodifluoromethane (Freon 12)
Dichlorofluoromethane
Ethylbenzene
Freon 113 (1,1,2-Trichloro-1,2,2-Trifluoroethane)
Freon 114 (1,2-Dichlorotetrafluoroethane)
Heptane
Hexachloroethane
Hexane
Isooctane (2,2,4-Trimethylpentane)
m-/p-Xylene
Methyl *tert*-Butyl Ether (MTBE)
Methylene Chloride
Octane
o-Xylene
Pentane
Styrene
Tetrachloroethene
Toluene
trans-1,2-Dichloroethene
trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane (Freon 11)
Vinyl Chloride

Additional compounds available by TO-15 or TO-14A

1,2,4-Trichlorobenzene
1,2-Dibromo-3-chloropropane
1,4-Dioxane
2-Chlorotoluene
Acetonitrile
Acrolein
Acrylonitrile
a-Methyl Styrene
Benzyl chloride
Bromoethene
Cyclohexane
DIPE
ETBE
Ethanol
Ethyl Acetate
Ethyl Acrylate
Ethyl Methacrylate
Hexachlorobutadiene
Methyl Acrylate
Methyl Iodide
Methyl Methacrylate
Naphthalene
n-Butylbenzene
n-Propylbenzene
p-Isopropyltoluene
Propene
sec-Butylbenzene
TAME
tert-Butyl Alcohol
tert-Butylbenzene
Tetrahydrofuran
Vinyl Acetate

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601
717-656-2300

24/7 Emergency Response
717-556-7300