

A Practitioner's Guide to PFAS Testing

Discover the unmatched capabilities of PFAS testing with Eurofins.

Per-and Polyfluorinated Alkyl Substances (PFAS)

Leading the Industry in PFAS Analysis

Our Specialty Analytical Services Laboratory has the experience, resources, and technological innovations to address the environmental analytical challenges of PFAS. In this continually evolving landscape, we have invested in state-of-the-art instrumentation and industry-leading technical staff that provide our clients with the highest quality data and the most sensitive and selective PFAS analytical support in the industry.

The regulatory path for PFAS may be unclear, but our commitment to providing state-of-the-art analytical solutions to our clients for their decision-making processes is unwavering.

Our Practice Leaders and Technical Directors work closely with multiple industry trade organizations, working groups, and key researchers. This work places Eurofins at the forefront of discussions, innovations, as well as assisting to find solutions to a wide range of PFAS issues.



As the largest PFAS laboratory network in North America, we specialize in research, innovation, and production.

- 24 years of PFAS analytical experience
- 9 PFAS Laboratories Nationwide
- Largest Instrument Capacity in the World
- Dozens of matrices
- Over 100 compounds
- Tens of thousands of samples analyzed monthly
- More than 800,000 samples analyzed
- Executed more than 10,000 PFAS Projects

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Methods:

- EPA 537.1
- EPA 533
- 537 Modified
- EPA 1633
- FTOHs by GC/MS/MS
- EPA 1621
- CIC-TOF (AOF/EOF/TF)
- ASTM 8421 Modified
- TCLP/SPLP/LEAF
- OTM-45
- OTM-50/OTM-55
- Air by Mod TO-13A/TO-10A/TO-17

Capabilities & Quality



MATRICES



- AFFF Product
- AFFF Impacted Media



- Drinking Water
- Surface Water
- Groundwater
- Passive Samplers
- Fish Tissue
- Stormwater



- Soils
- Sediment
- Vegetation
- Concrete
- GAC/Resin
- Food/Feed



- Source Air
- Ambient Air
- Indoor Air
- Soil Vapor



- Wastewater
- Biosolids
- Landfill Leachate
- Sludge
- IDW



- Consumer Products
- Textiles
- Food Packaging
- Artificial Turf
- Electronics
- Dispersions

Questions to ask to ensure you are receiving defensible data:

- Does your lab have decades of experience with isotope dilution, high-resolution, ultra-trace methods, and LCMS technology?
- Was your lab invited to participate in validating all of EPA's PFAS analytical methods?
- What redundancy and control measures does your lab have in place to manage contamination events?
- Which lab does federal and state agencies consult regarding PFAS analytical solutions?
- Does your lab manage the potential for PFBA false positives?
- Is your lab backed by the industry's leading PFAS analytical experts?
- Does your lab understand the utilization of branched/linear isomer data beyond what the method tells them?
- What capacity and redundancy does your lab maintain within a single location?

With our depth of knowledge and expertise, Eurofins is the answer to your testing needs. Our reinvestment in the business ensures that we continue to offer advanced solutions to meeting regulatory compliance over the duration of the client program.



A History of Brilliance & Success

Our PFAS program is led by two centers of Excellence, each perched on a different coast. Our Lancaster, PA facility has decades of experience tracing back to the creation of the first commercial PFAS analysis methods. Our Sacramento, CA location houses cutting-edge technologies, national PFAS experts, and a focus on research and development. These two Centers of Excellence work to lay the foundation for the network of labs. The laboratories didn't just create the first commercial methods for PFAS analysis; they continuously led the charge in developing techniques for a wide array of applications, ranging from PFAS in AFFF, artificial turf, pesticides, food, activated carbon, dispersions, air, blood, and much more.



Our Centers of Excellence Model

Eurofins utilizes a unique model that highlights our dedication to providing our clients with the most innovative and expansive analytical offerings. All PFAS research and development is conducted within our Centers of Excellence located in Lancaster, PA and Sacramento, CA. These laboratories lay the foundation for the additional Eurofins PFAS laboratories across the country by exporting their established methods, techniques and standards. This model establishes the highest level of accuracy and technical expertise, providing you with access to world-class support and precise results.



Trusted Technical Expertise

Our unflinching investment in people, technology, and innovation has enabled us to develop revolutionary analytical solutions and validate standardized methods. It's one of many reasons why consultants, government agencies, and industry trailblazers rely on us for solutions to unprecedented PFAS challenges. From detecting PFAS in source air to dealing with ultra short chain PFAS, our labs provide the experience and technical expertise to tackle the most formidable problems. Our commitment to staying at the forefront of scientific advancements and our network's wide reach, makes Eurofins the ideal choice for those seeking reliable, cutting-edge, and defensible analytical solutions.



TOF, TOP Assay, Branched/Linear Isomers, and Non-Target Analysis

Available at Eurofins Centers of Excellence in Lancaster, PA and Sacramento, CA

On average, current analytical methodologies measure a discrete list of 40 PFAS compounds. Many additional PFAS are not determined as discrete compounds by existing commercial methods. Therefore, we may be underestimating the PFAS mass present in the environment. As the investigation and treatment of sites contaminated with PFAS matures, there is a growing interest in determining the contributions of different sources to the overall contamination and understanding the true mass of PFAS present. Eurofins has implemented several tools that illuminate additional pieces of the PFAS puzzle.

Total Oxidizable Precursors (TOP) Assay

An initial aliquot of each sample is analyzed for a suite of targeted PFAS compounds. A second portion of the sample is oxidized, extracted and analyzed for the same suite of PFAS and compared to the initial analysis. Increases in concentrations in the Perfluorocarboxylic Acids (PFCAs) indicate the presence of oxidizable precursors which constitutes a portion of the hidden mass. AFFF impacted samples analyzed by the TOP Assay have been shown to reveal an additional mass of PFAS compounds that can comprise of up to 70% of the fluorinated organics in the sample. Achievable detection limits are in the part per trillion (ppt) range.

Total Organofluorine (TOF)

The determination of total organic fluorine approaches quantitation of the unknown mass of PFAS from the angle of the fluorine content of a sample. With the use of combustion ion chromatography (CIC) a wide range of matrices are analyzed for Total Fluorine (TF), Absorbable Organic Fluorine (AOF) in liquids, or Extractable Organic Fluorine (EOF) in solids. Achievable detection limits are in the part per billion (ppb) range.

Extensive Compound List

As AFFF and other PFAS sources have changed vendors and formulations over the years, the concentration and composition of PFAS in those products has also changed. As the number of targeted compounds increases, the likelihood of a unique identification increases. This is not to say that increasing from a list of 30 PFAS to a list of 70 PFAS will elucidate a point source, only increase the potential for additional and unique positive identifications. Achievable detection limits are in the part per trillion (ppt) range.

Linear/Branched/Total PFAS

Separate results of the linear isomer and the sum of branched PFAS isomers for PFOA, PFOS, PFHxS, MeFOSAA, and EtFOSAA are possible. There are two main processes in which PFAS are created: Electrochemical and Telomerization. The electrochemical process produces both linear and branched isomers, but all are saturated, meaning that every carbon in the backbone is only bonded to another carbon and fluorine. The telomerization process results in mixed saturation but predominantly linear isomers. These data reported separately as Total Branched, Linear, and Total or "BLT" can yield more information than a single value would. While BLT assessments are nothing new for skilled PFAS researchers and laboratories alike, Eurofins is pleased to support a more refined BLT approach for PFOA which includes



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monitoring of additional ions of PFOA. This product offering is referred to as Forensic PFOA.

Non-Targeted Analysis (NTA)

While a long compound list and the ability to differentiate linear and branched isomers are powerful tools, there are estimated to be thousands of PFAS in-use or with legacy usage. As there are only analytical standards for a fraction of these compounds, additional instrumentation is needed to identify PFAS without commercially available standards. This task is best suited for Quadrupole-Time-Of-Flight Mass Spectrometry (QTOF-MS) or an LC Orbitrap. This analysis results in exact mass data that can be compared to a library of exact mass spectra (unique fragments of the original compound). Eurofins maintains a PFAS library of over 2,400 compounds and uses other public source libraries to compare to. This allows for unknown compounds to be identified with chemical formula, name, and CAS number.

PFAS Biomonitoring

PFAS

EXPOSURE™

Self-Collection Blood Test

Offered exclusively by Eurofins, this all-in-one self-collection solution allows you to sample at home or work.

PFAS chemicals may lead to serious health problems according to the Centers for Disease Control and Prevention (CDC). In a report from the National Academies of Science, Engineering, and Medicine (NASEM), the committee recommends clinicians offer PFAS blood testing to patients who are likely to have a history of elevated exposure. This includes those with occupational exposures or those who live in areas known to be contaminated. NASEM provided guidance regarding PFAS of concern and ranges for the sum of those 7 PFAS that suggest a low, moderate, or high risk of developing a negative health outcome with recommendations on follow up actions.

Biomonitoring for PFAS in humans has been conducted by the CDC on serum for many years and published in the National Health and Nutrition Examination Survey (NHANES). To date, testing for PFAS in blood has relied on serum as an estimation for whole blood, required a blood draw conducted by a healthcare practitioner, and captured 16 PFAS total. In a leap forward for PFAS biomonitoring, Eurofins has developed a more comprehensive blood test that allows for self-collection and captures over 45 PFAS, the PFAS Exposure™ test. Our kit is the first of its kind and uses a simple finger prick. With serum equivalent conversions provided, our results can be directly compared to the national averages published by the CDC. Eurofins also supports traditional serum or plasma analysis and not only humans but in any type of animal to support project specific objectives.





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Eurofins is accredited by each state, where PFAS certification is offered, as well as NELAC, ISO 17025, and Department of Defense (DoD) and Department of Energy (DoE) ELAP programs following QSM protocols for PFAS