



Other Test Method 45 (OTM-45) Measurement of Selected Per- and Polyfluoroalkyl Substances (PFAS) from Stationary Sources

Emissions from Stationary Sources

With increased awareness regarding source air emissions there is growing concern regarding the short and long range transport of these emissions, contaminating ambient air with measurable impacts to surface water, soil, and eventually groundwater. However, there is a lack of US EPA published methods for PFAS in source or ambient air which has made assessing these impacts unachievable until recently. US EPA has now published OTM-45 that now offers a standardised sampling and analysis strategy for up to **50 PFAS compounds** and while this category of test methods is to be formally regulated it does provide regulatory agencies, the regulated community, and the public at large with potentially helpful tools. Eurofins has been working with the US EPA in developing this methodology because validated measurement methods are limited and under development for reliably identifying and quantifying if per- and polyfluoroalkyl substances (PFAS) are released into the air from stationary sources. The current lack of standardised methods to measure PFAS emissions and the limited availability of data on the performance of methods to measure PFAS introduce uncertainty in the understanding of the release of PFAS into the air from these sources. The lack of validated stationary source measurement methods for PFAS also leads to inconsistent findings, incomparable measurements, and lack of coordination between policy makers, facilities and

control technology development. This OTM recommends a consistent method for use by the facilities, stationary source test teams, research laboratories, and other stakeholders to measure a common list of PFAS compounds emitted from vents and stacks.

Eurofins has been a pioneer in this field, conducting the necessary method development to support existing consent orders, research studies and the government in their method development efforts over the past few years. These methods are built from EPA standard methods for semi-volatile and volatile compounds in air but modified to support the complexities unique to PFAS chemicals. The method development process has illuminated much about the unique chemical characteristics of these compounds and how they behave under different conditions. Having a thorough understanding of these complexities and how to manage them is paramount to obtaining defensible and reliable results.

Eurofins has experience with testing PFAS emissions from the following types of facilities:

- Thermal oxidiser treating PFAS chemical manufacturing waste products and contaminated soils
- Carbon Beds treating PFAS off-gas from chemical reactor beds

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- Cement kiln operations processing PFAS wastewater
- Carbon regeneration plants that treat bulk spent carbon
- Sewage Sludge Incinerators (SSI) that are known to process PFAS contamination
- Municipal Waste Incinerator systems that burn end-of-use fluoropolymer wastes
- Thermal desorber/secondary combustion soil treatment processes.
- Electrochemical oxidation of PFAS concentrates

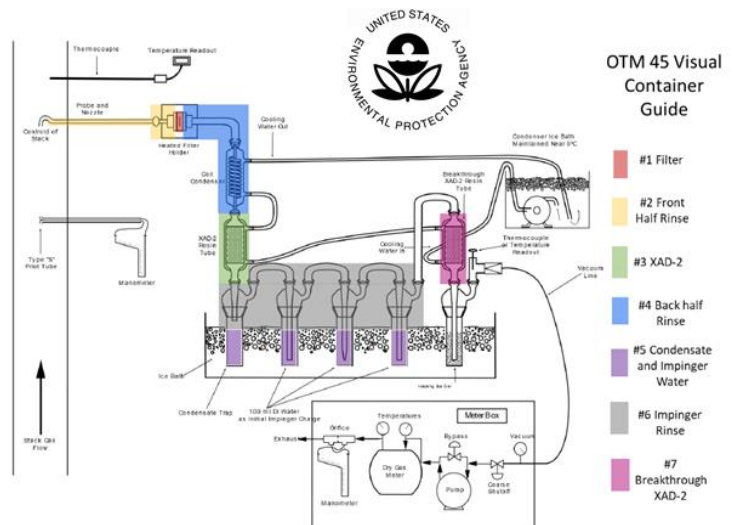
Analytical & Sampling Requirements

The analytical method imbedded in OTM-45 may support a variety of monitoring applications, which include the analysis of multiple short-chain PFAS that may not be part of the routine screening that the majority of laboratories currently offer. This method describes the sampling and sample recovery procedures used to measure individual semi-volatile PFAS from stationary source air emissions. OTM-45 incorporates by reference some of the specifications (e.g., equipment and supplies) and procedures (e.g., sampling and sample preparation) from other methods that are essential to conducting OTM-45. To obtain reliable samples, source sampling teams should be trained and experienced with the following additional US EPA test methods: Method 1; Method 2; Method 3; Method 4; and Method 5. Laboratory analysis teams should be trained and experienced in the use of liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS) multiple reaction monitoring (MRM) as described in US EPA Method 533 and Method 537.1.

Furthermore, like emission sampling methods for dioxins and PAHs, OTM-45 requires the pre-spiking of the adsorbent XAD-2 traps with isotopically labelled PFAS compounds to monitor the efficacy of the sampling process. The method is also very prescriptive with respect to ensuring all components of the sampling train have been pre-cleaned and PFAS free and determination using isotope dilution is used for each sample.

Sampling Train

The figure below shows the modification to the normal MM5 sampling train together with the containers used for analysis. OTM-45 proposes seven (7) discrete sample analyses and requires specific sample recovery solvents and containers that are PFAS-free.



Sampling Services

Eurofins Environment Testing is NATA accredited for the sampling & analysis of stack emission discharges.

Our field staff are trained in all aspects of stack emission techniques and on-site safety. All staff carry EWP (Elevated Work Platform) licences and we routinely undertake work in Victoria (metro & Country), Tasmania, NSW & SA. All air sampling equipment is owned, maintained and calibrated by Eurofins Environment Testing.

Logistical Support

If you would like to discuss logistical details for your upcoming projects then please contact your local Analytical Service Manager or one of our Business Development Team listed below.

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