



## UNDERSTANDING PFAS IN STACK EMISSIONS AND THE RISE OF REAL-TIME MONITORING

Navigating the complexities of PFAS emissions testing is increasingly critical as regulators seeks to close the gap between so called 'forever chemicals' and other pollutants. But as Element's Mark Elliott explains, solutions are available.

With a backdrop of tightening regulation, industrial facilities face growing pressure to demonstrate their ability to control and reduce PFAS in their emissions.

On 3 February 2026, the Department for Environment, Food & Rural Affairs (DEFRA) published its PFAS Plan, which sets out a UK framework for understanding and addressing what it describes as "one of the most pressing chemical challenges of our time".

While a lot of attention has been on the impact of PFAS on water supplies, the plan also explicitly states the intention to address air emissions.

Currently, not all PFAS compounds are included on the UK Pollutant Release and Transfer Register (PRTR) alongside things like greenhouse gases and do not have clear limit values. Standard monitoring methods and adopted best available techniques, associated with things like NOx in environmental permits, are not yet in place for all PFAS compounds. These are instead being dealt with on a site-by-site basis.

The Government's plan is set to change this, and industries like Energy from Waste, alongside chemical producers and product manufacturers reliant on PFAS should be considering approaches now, if they don't want to be caught out later.

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### PFAS stack emissions sampling methods

In stack emissions, PFAS are released as gaseous or particulate matter during industrial processes such as manufacturing or incineration where abatement is challenging and careful monitoring is required.

Once airborne, the geographical impact of PFAS can be far reaching, depositing onto soil and surface water, and subsequently leaching into groundwater.

In the absence of a European method for PFAS, the EA currently stipulate using US EPA OTM 45 and/or US EPA OTM 50 to sample PFAS and volatile fluorinated compounds from stacks.

OTM 45 is an extractive test using a heated sample probe and filter prior to entrapment in a sampling train using dual resin traps and impingers, over a 3-hour period. The sampling train undergoes rigorous cleaning prior to use, and several control blanks are taken during the campaign.

OTM 50 for volatile fluorinated compounds involves sampling stack gas into evacuated passivated canisters. Depending on the nature of the stack gas, the sample train may need to incorporate a water and acid gas management system to condition the gas for collection. The sample flow is controlled via a calibrated critical orifice, and a pressure gauge is used to monitor the pressure in the canister.

### The emergence of real-time, on-site PFAS emissions monitoring

These methods are reliable but only provide samples from single data points and require lengthy sampling periods. They do not address the emerging challenge for site operators - Obtaining real-time data to pinpoint specific PFAS compounds and ensuring their destruction through process optimisation.

New instrumentation such as SIFT-MS can detect PFAS compounds in real-time, offering immediate insights into PFAS concentrations of emissions. Test methods, utilizing SIFT-MS, have been developed to detect targeted gaseous PFAS compounds at sub-ppm levels, even in the presence of other organic compounds.

Continuous sampling like this provides data on emissions during process changes, allowing operators to respond instantly to fluctuation in PFAS concentrations. This method can be utilised independently or as part of a combined testing strategy alongside accredited laboratory analysis. On-site monitoring provides immediate visibility of targeted PFAS compounds, while laboratory testing offers broader and regulatory-approved data needed for compliance reporting.

### Getting prepared for PFAS regulation

PFAS emissions testing is likely to evolve rapidly as the government looks to close the existing regulatory gap. Other countries like Belgium, France Germany and the US are already several steps ahead, so templates already exist.



But we need to be clear that PFAS isn't just another pollutant, it's a whole new class of chemicals entering existing compliance frameworks. Effected industries need to be ready for new monitoring requirements, permit changes, greater liability and reporting exposure.

We recommend site operators take a structured, risk-based approach to their testing programmes. Early engagement with your testing provider is key. Identifying the specific compounds of concern will influence method selection, helping you build a robust programme that generates defensible data and reduces the risk of non-compliance.

Thankfully, we are not starting from zero and solutions are available. Understanding the available sampling methods, alongside their limitations, is an important step in building an effective testing programme. Meanwhile, advancements in real-time testing, will allow site operators to take even greater control of their PFAS emissions management.

Element's emissions team's based in our Stockport office and our Deeside facility are the lead provider of MCERTS-accredited emissions testing services in the UK and Ireland, and we are developing comprehensive PFAS emissions monitoring and analysis techniques. We're ready to support the industry through the transition.

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