CUSTOMER STORY

How TERA Environnement is Shaping the Future of PFAS Air Monitoring with the QSight LC/MS/MS

Introduction

PFAS contamination in outdoor air is globally recognized as an emerging environmental concern, yet there is an increasing need for more standardized testing methodologies in this area. TERA Environnement, an esteemed development laboratory in France, is leading the charge in developing precise and reliable methods for monitoring PFAS in outdoor air.

TERA is making waves in air analysis across France, testing rainwater and active air samples for PFAS contamination using the PerkinElmer QSight® 420 LC/MS/MS. As a result of the QSight 420's patented StayClean™ Source technology, TERA is achieving groundbreaking levels of sensitivity in their sample testing, reaching up to 100 times lower quantification limits than other LC/MS/MS instrumentation in the field without the need for large sample handling.

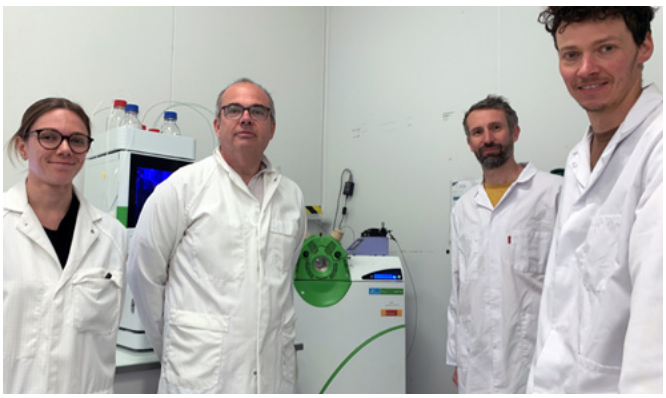
KEY TAKEAWAYS:

- PFAS in outdoor air is still a relatively unregulated but important research area.
- TERA Environnement is a leader and pioneer in PFAS air monitoring in France, paving the way for future testing and method development.
- TERA is achieving unmatched sensitivity and low quantification abilities with the QSight LC/MS/MS, leading to less sample prep and higher throughput.

With a reduced need for timely sample preparation, less usage of consumables, and minimized errors associated with multi-step sample preparation, the team are able to work toward their research goals with higher throughput and overall efficiency.

Read on as Vincent Ricard, Director of Operations and Strategy at TERA Environnement, tells us more.

PerkinElmer®
Science with Purpose



Pictured: TERA Environnement researchers in the lab. From left to right: Pauline De Bock, Vincent Ricard, Julien Guilhermet, Raphael Julio.

On a PFAS Research Mission

At its core, TERA Environnement is a research-driven organisation. With a compact team of just 40 lab professionals spread across two locations in France, they are dedicated to investing an impressive 10% of their annual revenue into analytical innovation. Their focus: unravelling the mysteries of microplastics and PFAS in our air.

"Our motivation stemmed from the rise in PFAS-related regulations in France,"

"After water and chimney emissions were addressed, we knew outdoor air would be next. Given the toxicity of PFAS, understanding how much we're inhaling daily became a critical public health mission."

...explains Vincent.

Their work is now closely aligned with national efforts to legislate and regulate PFAS exposure. They are collaborating on projects and sharing data with AFNOR, the French Ministry of the Environment, and the High Council for Public Health. Through their research, TERA is contributing to the development of policies that will standardize air monitoring nationwide, and establish a validated method for PFAS analysis in air.

Overcoming Challenges with Ultra-Sensitive Technology

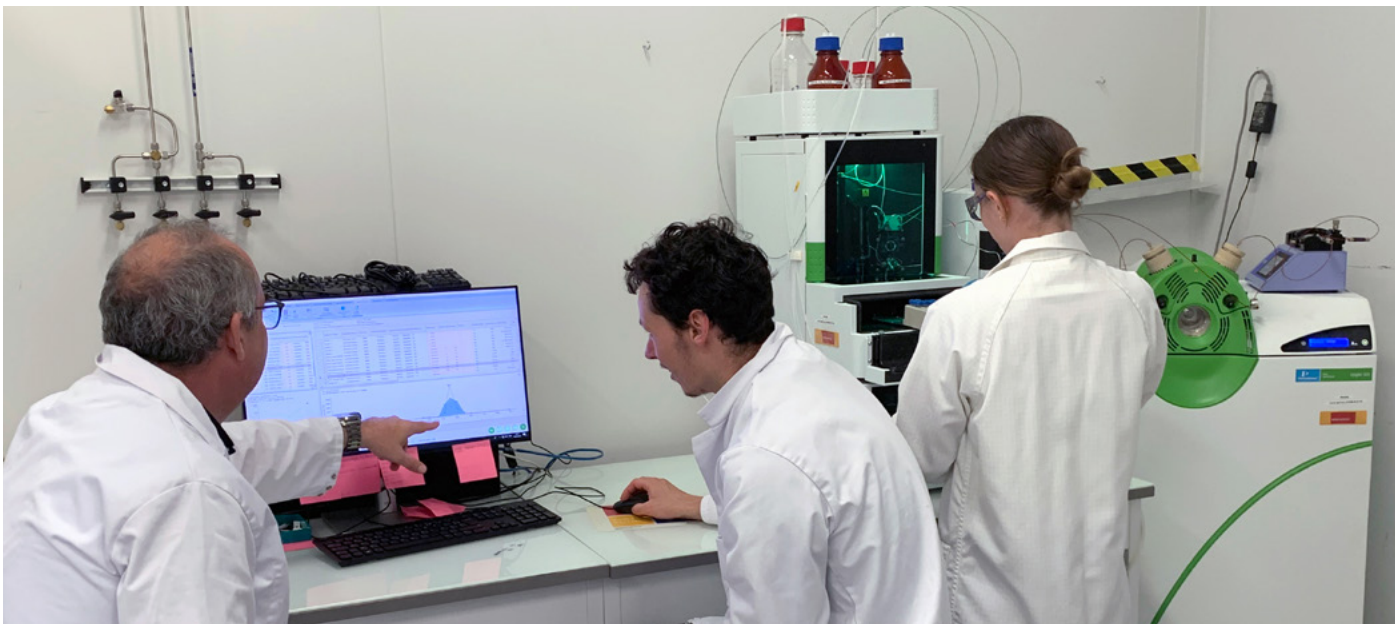
Monitoring PFAS in air presents its own unique technical hurdles, with target quantification limits (QLs) set at anywhere from 100 to 1000 times lower than in water or soil. Such sensitivity demands both high levels of analytical precision and minimal sample preparation to avoid contamination.

This is where the QSight 420 LC/MS/MS proves invaluable.

"With the QSight system, we're detecting PFAS at limits up to 100 times lower than what other laboratories are achieving with alternative LC/MS/MS instrumentation. For rainwater, we've gone from needing 5 litre samples, down to as little as 100 to 200 ml."

"This shift not only minimises the risk of contamination, but it significantly increases qualitative validation, reduces timely sample preparation, and accelerates our overall workflow efficiency."

...says Vincent.



Pictured: TERA researchers reviewing results using Simplicty 3Q™ software and uploading new samples to the next run.

Maximizing Throughput, Minimizing Error

For a research lab like TERA, efficiency isn't just about speed – it's about accuracy, repeatability, and resource conservation. By eliminating multiple steps in sample prep, the QSight 420 enables TERA to increase their throughput without compromising quality.

Thanks to the QSight's StayClean Source technology, TERA can achieve ultra-low quantification limits without sacrificing throughput. In fact, many of their samples can be analysed via direct injection, bypassing lengthy concentration procedures, reducing solvent usage, and minimizing errors associated with multi-step sample preparation.

"The fewer the steps, the less the chance for contamination. And that's huge when we're dealing with such low concentrations,"

"The system also reduces our need for consumables and solvents, which not only lowers costs but makes our workflow more sustainable."

...Vincent notes.

Whether it's rainwater or air filter extracts, TERA can now process samples with remarkable speed and reliability, giving them more time to focus on advancing methods and meeting their research goals.

Setting the Standard for Tomorrow

TERA Environnement's work goes far beyond their own laboratory walls. As they come into the final stages of trial, they are on track to provide a validated blueprint for other laboratories across Europe and beyond.

"Our goal is to create a reproducible, reliable method that others can adopt," Vincent says. "Even though this area of monitoring isn't yet regulated, having a standard gives labs the confidence to explore it, and gives policymakers a foundation to build on."

As awareness of PFAS contamination grows, so too does the need for comprehensive air quality monitoring. With leaders like TERA Environnement driving innovation, the environmental research community is one step closer to understanding, and eventually mitigating, airborne PFAS exposure.

Contributors:

Vincent Ricard
Director of Operations and Strategy at TERA Environnement, France

PerkinElmer U.S. LLC
710 Bridgeport Ave.
Shelton, CT 06484-4794 USA
(+1) 855-726-9377
www.perkinelmer.com

For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs

211950