Time and freedom to tackle other challenges

Dionex AutoTrace 280 PFAS SPE Instrument
What else can you accomplish while your PFAS samples are prepared automatically?

In today’s busy labs, everyone needs to do more with less. As daily tasks grow, so does your need to prioritize. All too often, urgent demands—like PFAS sample preparation—take priority over important strategic work, which is forced to take a backseat. Even worse, some tasks may get rushed, leading to errors and the need to rerun batches or even resample. Truth is: Preparing per- and poly-fluoroalkyl substance (PFAS) samples manually is very time-consuming.

Imagine what you could do if you recaptured the time spent doing manual solid-phase extraction (SPE) for your PFAS water samples. Combine that with better recoveries, reproducibility, and productivity—and it’s easy to see how your lab can surmount the challenges of PFAS analysis. With heightened efficiency, your lab can conquer anything else it encounters. It’s time to discover the Thermo Scientific™ Dionex™ AutoTrace™ 280 PFAS solid-phase extraction instrument.

**Dionex AutoTrace 280 PFAS instrument overview**

- Designed to automate SPE for U.S. EPA Method 533 and U.S. EPA Method 537.1
- Greatly reduces background contamination with non-fluoropolymer-based tubing, valves, and filters
- Saves time and labor ensuring high reproducibility and productivity for PFAS sample preparation
- Extracts analytes of interest from large volume aqueous samples easily and efficiently
- Processes ground, surface, and wastewater samples
- Processes up to six samples with minimal user interaction
- Automates eliminates errors in the manual process
- Positive pressure loading and elution ensures accurate flow rate control improving analytical precision
- Accomplishes SPE without the need to learn new software
Supporting better sample prep—and safer drinking water

PFAS are considered “Forever Chemicals” due to their prevalence and persistence in the environment. Found almost everywhere, these chemicals do not breakdown and accumulate in biological systems. PFAS, even at trace levels, are associated with several health and public safety concerns, and enter the drinking water supply through run-off into source water. Monitoring these compounds is critical to ensuring safe drinking water.

Important considerations in PFAS analysis

**Background contribution**
- Analytical and sample prep instruments
- Laboratory supplies (e.g., gloves or foil)
- Personal care products
- Sample collection equipment

**Analysis**
- Trace-level requirements
- Identification and confirmation
- Large number of compounds
- Limited standard and reference materials

**Sample prep**
- Labor-intensive manual SPE
- Recovery and reproducibility requirements
- PFAS can adhere to lab supplies and instrument materials
General SPE protocol for PFAS samples
The Dionex AutoTrace 280 PFAS instrument automates the SPE process. First, the SPE cartridges are conditioned with the solutions. Cartridges can not go dry during conditioning or before loading samples. Next, the drinking water samples are pumped from the sample container through the SPE cartridges. As the sample passes through the SPE sorbent, PFAS analytes are adsorbed and concentrated as the liquid goes to aqueous waste. The cartridge is then dried before eluting the PFAS components. Samples are then dried and reconstituted with 1 mL of the solution specified in the method.

U.S. EPA Method 537.1 extraction

**SPE cartridge conditioning**
1. 15 mL methanol
2. 18 mL water
   
   *A 1-minute soak helps with recovery*

**Sample loading**
1. Load 250 mL of sample at 10–15 mL/min
2. Rinse sample bottles with water and methanol
3. Dry cartridges before elution

**Cartridge elution**
1. Elute SPE cartridges with two 4 mL aliquots of methanol
   
   *Elution must be done in dropwise fashion*

U.S. EPA Method 533 extraction

**SPE cartridge conditioning**
1. 10 mL methanol
2. 10 mL 0.1M phosphate buffer
3. Add another 2–3 mL phosphate buffer then about 5 mL water

**Sample loading**
1. Load 100–250 mL of sample at 5 mL/min
2. Rinse sample bottles with 10 mL ammonium acetate and 1 mL methanol
3. Dry cartridges before elution

**Cartridge elution**
1. Elute SPE cartridges using methanol with 2% ammonium hydroxide.
2. Repeat bottle rinse with 5 mL methanol with 2%
   
   *Elution must be done in dropwise fashion*
PFAS application data

Extracted samples were analyzed by LC-MS/MS using SRM according to U.S. Method 537.1

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<th>Peak number</th>
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<th>Mean Recovery (%)</th>
<th>RSD</th>
<th>Fortified Conc. (ng/L)</th>
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* Designates the isotope labeled internal standard or surrogate.

U.S. EPA Method 537.1 requirements
- Recoveries must be 70–130%
- RSD ≤ 20%

Dionex AutoTrace 280 PFAS instrument shows excellent recovery and reproducibility
- All 18 PFAS compounds and deuterated standards between 84–123%
- RSD between 1.1–9.9%

LC-MS/MS chromatogram shows excellent separation with a 15-min run time
A blank sample was extracted using the Dionex AutoTrace 280 PFAS instrument. This chromatogram shows there is no significant background contribution from the instrument.
Maximizing your chromatography productivity and achieving reproducible results requires optimizing the whole workflow from sample to knowledge. By choosing the right tools, from your sample preparation (manual or automated) to the highest selectivity column chemistry and cleanest vials, you maintain sample integrity and achieve the highest instrument efficiency and reduce the need for costly reanalysis. With the largest portfolio of sample handling; vials, plates and closures, column chemistries in a broad range of dimensions and sample preparation, we remain a steadfast and committed partner in your endeavor to improve the world around us.

### Ordering information

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<td>SolEx WAX SPE Cartridges, 6 mL, 500 mg (For U.S. EPA Method 533 only)</td>
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Do you want to run other methods with your new Dionex AutoTrace 280 PFAS instrument? Contact us for guidance.

For more information or to place an order, contact the Thermo Fisher Scientific office nearest you or your local distributor.

### The value of support and service

When you purchase any Thermo Scientific instrument, module or system, you get a partner, not just a piece of equipment. We provide access to a wide range of quality post-installation programs and assistance including expert customer training, comprehensive service agreements, validation and qualification services, application support, and timely, professional service by skilled, locally based representatives. Our service representatives are distributed around the world, but close to you, ready to provide professional assistance, whether you’re a new customer or a longtime partner. Your success equals our success.

Find out more at [thermofisher.com/autotrace](http://thermofisher.com/autotrace)