



Equip your PAL Systems for PFAS Analysis with PFAS-free Upgrade Kits

Minimize PFAS
Background

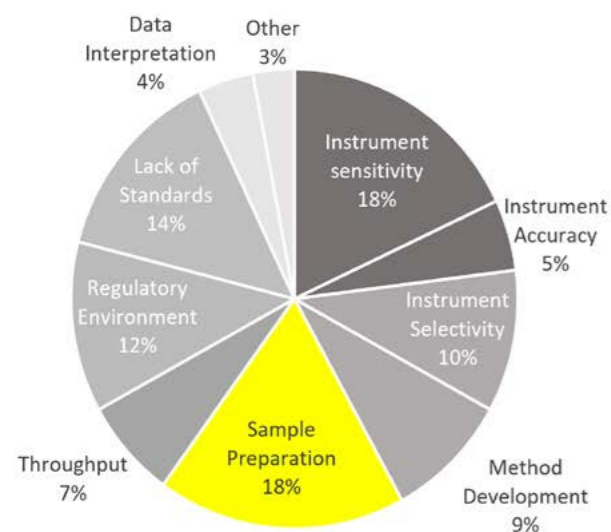


Overcome Sample Preparation Challenges in PFAS Analysis with PAL Systems and Products

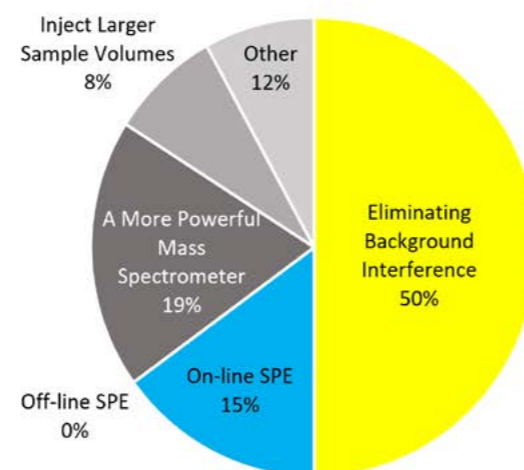
Per- and polyfluoroalkyl substances (PFAS) are persistent chemicals with water and oil repellent properties, used in a large variety of products but posing environmental and health risks. Therefore, PFAS analysis has become a pressing environmental and public health concern worldwide, and the development of analytical workflows with low detection limits for PFAS analysis has become paramount. A survey^[1] conducted by "the Analytical Scientist" revealed that "Sample Preparation" ranks top among the main challenges for PFAS analysis, while "Eliminating background interference" emerges as the most desirable factor for improving sensitivity.

PAL Systems are uniquely equipped to address these challenges, offering solutions to automate sample preparation process to reduce errors and improve repeatability, as well as offering PFAS-free products to minimize background contamination for optimal sensitivity and accuracy.

Which are the main challenges related to PFAS analysis?



Which are the most desirable for improving sensitivity?



PAL PFAS-free Upgrade Kits and Parts ensure:

- Uncompromised Accuracy: Minimize background interference and maximize analytical precision for your PFAS analysis.
- Reliable Performance: Trust in the quality and reliability of our upgrade kits, engineered for optimal performance in PFAS analysis.
- Seamless Integration: Easily integrate our components into your existing instrument setup for hassle-free upgrades.

[1] Reference: <https://theanalyticalscientist.com/fields-applications/trends-and-challenges-in-pfas-analysis>

Transition to PFAS-free Tubings and Kits to Reduce Background Contamination

PFAS-free Tubings

- PEEK tubings instead of common PFA- or PTFE tubings to eliminate the risk of PFAS contamination
- Pre-shaped for difficult-to-access connection positions to simplify installation without risk of kinking



Tubing for connection of LC/MS Tool



Solvent Inlet Kit incl. tubing, filter and cap



Tubing for connection of Dilutor Tool



Tubing for HF Fast Wash Module



Tubing for HF Fast Wash and Fast Wash Module

Sample Loop

- Made from transparent PEEK allowing observation of air bubbles
- Pre-shaped for easy installation



Wash Cup

- Made from PEEK to avoid PFAS contamination
- Injection and cleaning of syringe and injection valve at a single location



Automate your PFAS Sample Prep & Analysis

LC/MS Tools

- High-throughput with cycle time down to 48 s (PAL RTC) / 26 s (PAL DHR)
- Lowest carryover
- Standard and extra-long needle available, possible to access vacutainers
- Find more in the [LC/MS brochure](#)

μSPE Cartridges

- Much less solvents and samples compared to classic SPE
- Variety of sorbents available, incl. WAX for PFAS enrichment
- Filtration cartridge available for sample filtration
- Find more: [PAL μSPE Cartridges](#)

Online SPE

- Multiple valves setup for automated online SPE process
- Can load large sample volume using Dilutor Tool or Liquid Syringe Tools
- Compatible with all commercial online SPE columns

Extraction

- PAL Vortex Mixer and PAL Centrifuge available for sample extraction
- Find more: [Sample Prep Capabilities](#)



Ordering Information



Upgrade Kits for Tools and Modules

Part number	Description
PAL3-LCMS100Up-PFCFr-S	PFAS-free Upgrade Kit for LC/MS Tool with membrane pump and 100 μl loop for up to 850 mm PAL Systems
PAL3-LCMS100Up-PFCFr-X	PFAS-free Upgrade Kit for LC/MS Tool with membrane pump and 100 μl loop for up to 1200 mm PAL Systems
PAL3-LCMS250Up-PFCFr-S	PFAS-free Upgrade Kit for LC/MS Tool with membrane pump and 250 μl loop for up to 850 mm PAL Systems
PAL3-LCMS250Up-PFCFr-X	PFAS-free Upgrade Kit for LC/MS Tool with membrane pump and 250 μl loop for up to 1200 mm PAL Systems
PAL3-LCMS100VP-PFCFr-S	PFAS-free Upgrade Kit for LC/MS Tool with volumetric pump and 100 μl loop for up to 850 mm PAL Systems
PAL3-LCMS100VP-PFCFr-X	PFAS-free Upgrade Kit for LC/MS Tool with volumetric pump and 100 μl loop for up to 1200 mm PAL Systems
PAL3-LCMS250VP-PFCFr-S	PFAS-free Upgrade Kit for LC/MS Tool with volumetric pump and 250 μl loop for up to 850 mm PAL Systems
PAL3-LCMS250VP-PFCFr-X	PFAS-free Upgrade Kit for LC/MS Tool with volumetric pump and 250 μl loop for up to 1200 mm PAL Systems
PAL3-FWashHFUp-PFCFr	PFAS-free Upgrade Kit for PAL High Flow Fast Wash Module
PAL3-FWashUp-PFCFr	PFAS-free Upgrade Kit for PAL Fast Wash Module
PAL3-DilSinUp-PFCFr-S	PFAS-free Upgrade Kit for PAL Dilutor Single for up to 850 mm PAL Systems
PAL3-DilSinUp-PFCFr-X	PFAS-free Upgrade Kit for PAL Dilutor Single for up to 1200 mm PAL Systems
PAL3-DilMulUp-PFCFr-S	PFAS-free Upgrade Kit for PAL Dilutor Multi for up to 850 mm PAL Systems
PAL3-DilMulUp-PFCFr-X	PFAS-free Upgrade Kit for PAL Dilutor Multi for up to 1200 mm PAL Systems

Ordering Information

Accessories and Replacement Parts



Part number	Description
PAL3-DilAspKit-PEEK	PFAS-free Solvent Inlet Tubing Kit incl. PEEK solvent inlet filter, solvent bottle cap and PEEK Tubing for connection to the pump
PAL3-LCMSLoop-100PEEK	PFAS-free 100 µl holding loop for LC/MS Tools made from transparent PEEK, with fittings
PAL3-LCMSLoop-250PEEK	PFAS-free 250 µl holding loop for LC/MS Tools made from transparent PEEK, with fittings
PAL3-TubLCMS-PEEK	PFAS-free Tubing for connection between membrane pump and LC/MS Tools for up to 850 mm PAL Systems
PAL3-TubLCMS-PEEK-X	PFAS free Tubing for connection between membrane pump and LC/MS Tool for up to 1200 mm PAL Systems
PAL3-TubLCMS-VP-PEEK	PFAS-free Tubing for connection between volumetric pump and LC/MS Tool for up to 850 mm PAL Systems
PAL3-TubLCMS-VP-PEEK-X	PFAS-free Tubing for connection between volumetric pump and LC/MS Tool for up to 1200 mm PAL Systems
PAL3-TubeHFFW-PEEK	PFAS-free Tubing for connection between pump and T-union of High Flow Fast Wash Module
PAL3-TubeFW-PEEK	PFAS-free Tubing for PAL Fast Wash and High Flow Fast Wash Module
PAL3-TubeDilutorPEEK	PFAS-free Tubing for connection between Dilutor and Dilutor Tool for up to 850 mm PAL Systems
PAL3-TubeDilutorPEEK-X	PFAS-free Tubing for connection between Dilutor and Dilutor Tool for up to 1200 mm PAL Systems
PAL3-TubeDilPEEK-5ml	PFAS-free Tubing with 2 mm id and 1.6 m length, 5ml internal volume, for connection between Dilutor and Dilutor Tool, for up to 850 mm PAL Systems
PAL3-WashCup-G22-PEEK	PFAS-free Wash Cup for injection valves

Best Practices to Reduce PFAS Background from PAL Systems



- **Instrument upgrade:** Upgrade all PAL Tools and Modules that contain PFAS-containing components such as PFA tubings, FEP sample loop, PTFE filter insert, with PFAS-free Upgrade Kits
- **Thorough Cleaning Procedures:** Since PFAS can stick to the needle and syringe after high concentration injections, extended or customized wash option using two wash solvents (organic and aqueous) can be used if necessary.
- **PFAS-free solvents:** Use solvents that are free of PFAS, use cellulose filter membranes instead PTFE membranes when pre-filtering solvents.
- **Other general rules:**

Do:

- Use HDPE or PP containers and PFAS-free caps for samples
- Store samples below 6 °C
- Wear clean lab coats and powderless nitrile gloves
- Use a delay column between mobile phase mixer and sample injector to reduce system-related PFAS background

Don't:

- Wear personal care products during handling samples
- Wear waterproof or stain-resistant clothing, gloves or shoes
- Use markers or waterproof pens

Coming soon...

- PFAS-free PAL Injection Syringes and Dilutor Syringes
- PP Vials of different dimensions with high recovery design
- PAL Vial Caps with PFAS-free septa

PAL SYSTEM

Ingenious sample handling



Contact the experts for sample preparation:



Or find your nearest [value added reseller](#).

For more information on the PAL System visit:

www.palsystem.com



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