

PFAS in Water by microSPE, Automated on ePrep ONE (performance equiv. EPA 537 and 1633)

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ePrep Applications



Key Benefits

- **MicroSPE** – 10mL sample Input to 200uL Output, 1:66 concentration with no Blowdown
- **Fully Automated** - End-to-End Processing, no manual handling
- **Sensitivity** - LOQ=1-4ng/L @ 10% RSD (assumes suitable analytical instruments)
- **Sample Types** - Clean and Dirty water sample workflows
- **Solvent Usage** - 80% less than traditional methods

Introduction

Environmental laboratories face growing demand for automated PFAS analysis with greater sensitivity and reduced environmental impact. This application note demonstrates a microSPE method for PFAS determination in water using the ePrep ONE platform, delivering end-to-end automation, reduced sample volumes, and no solvent blowdown – while meeting EPA Method 1633 requirements.

Unlike traditional SPE, ePrep microSPE miniaturizes extraction without sacrificing regulatory compliance, addressing background contamination, isotope standard recovery, matrix interference, and throughput challenges in drinking and trade waste waters.

Experimental

Instrumentation: ePrep Sample Preparation Workstation (PFAS-free microPFAS configuration) coupled to an LC/TQ or LC-Orbitrap configured for PFAS analysis and isotope dilution.

Workflows: Two workflows are available (Figure 1) based on sample type. Clean samples use 8 mL with a 2 mL plug wash (~11 min/sample); high-particulate samples use 10 mL with a 750 µL tube wash (~14 min/sample).

Quantitation: EPA Method 1633, with analytes normalized against extractable internal standards.

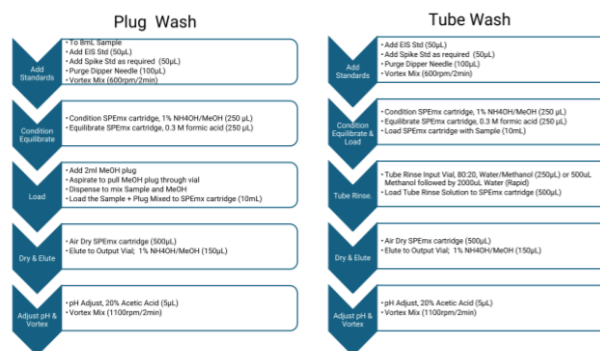


Figure 2 Flow Diagram Plug and Tube Wash

Results and Discussion

Both the Tube and Plug Wash Workflows produced satisfactory normalized analyte recoveries (Figure 5). The Plug Wash method demonstrated superior raw EIS recoveries, particularly for HMW PFAS analytes (Figure 4).

For high-particulate "dirty" samples, the Tube Wash method is recommended to minimize cartridge blockage risk during loading, as it allows most of the sample to be removed above the sediment layer.

Carryover studies confirmed that ePrep washing can reduce 20 ppb samples to 1 ppt for PFOS.

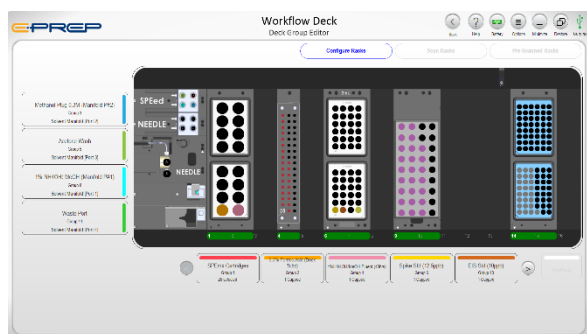


Figure 1 ePrep Software Deck Layout

Conclusion

The ePrep ONE microSPE platform delivers a compelling solution for automated PFAS water analysis. With a 10 mL sample input concentrated to 200 µL output (1:66 concentration, no blowdown), the system

achieves LOQs of 1–4 ng/L at 10% RSD while eliminating manual handling entirely. Workflows accommodate both clean and high-particulate water samples, and solvent consumption is reduced by 80% compared to traditional SPE methods.

Plug vs Tube Wash Processes:

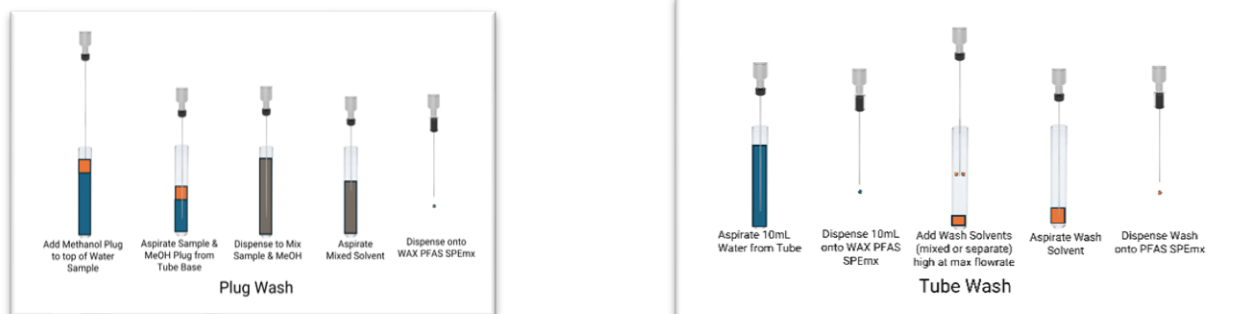


Figure 3 Plug and Tube Wash Processes

EIS Recovery Comparisons – Plug vs Tube Wash Workflows

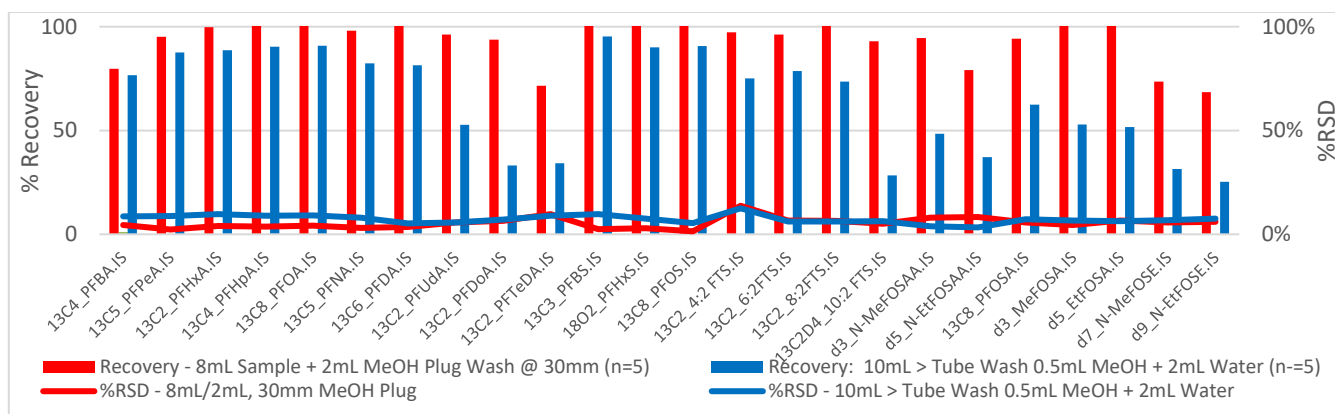


Figure 4 EIS Recoveries

Analyte (Normalized) Recoveries – Plug vs Tube Wash Workflows

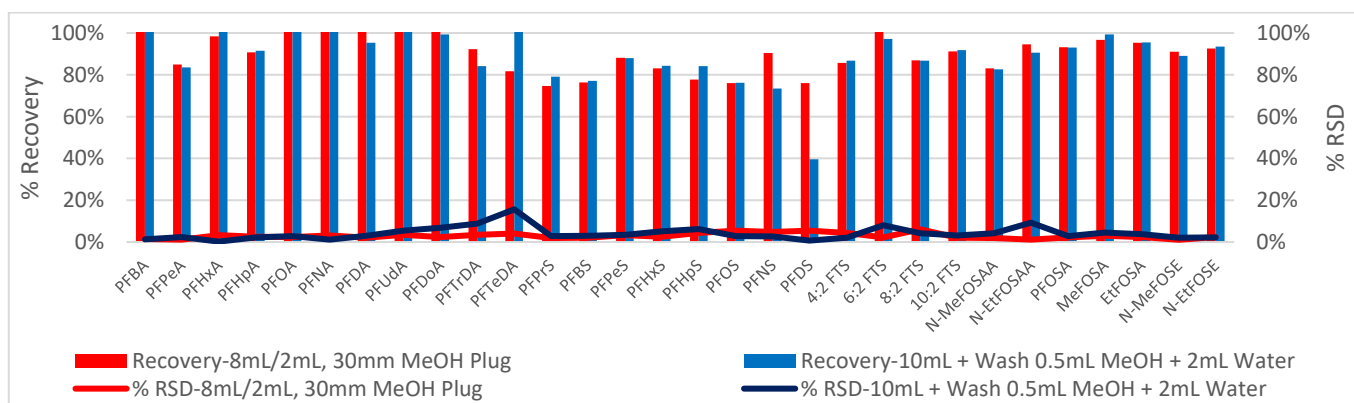


Figure 5 Analyte Recoveries

Other Publications and Resources

Publication	Description
98-35046AP	PFAS in Water by microSPE, Automated on ePrep ONE APP NOTE
Workflows	ePrep PFAS Water Plug vs Tubes Wash

* Contact your ePrep distributor to obtain copies of these resource materials