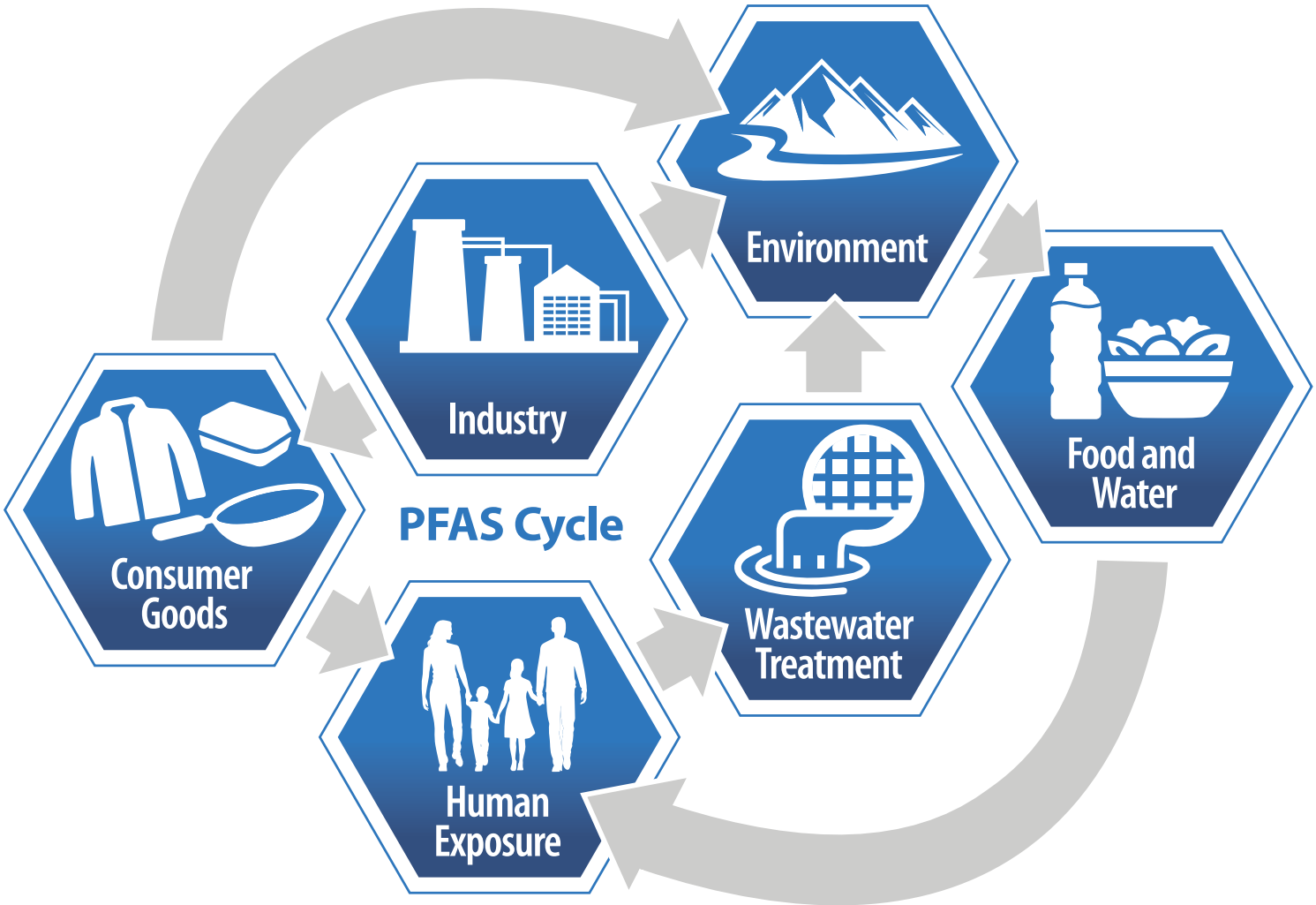
UCT

PFAS
SOLUTIONS GUIDE

Empowering Analytical Excellence for a Safer Future

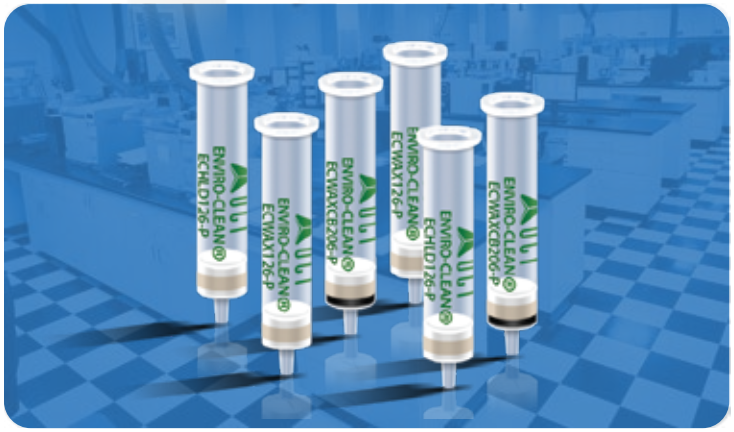
Per- and polyfluoroalkyl substances (PFAS) have been produced and utilized globally since the 1940s, including in the United States. This diverse group of synthetic organofluorine compounds has found widespread applications in various industries and consumer products, such as non-stick cookware, food packaging, firefighting foams, carpeting, textiles, and metal plating. Among the most widely manufactured and studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS).

During their production and application, PFAS can leach into the soil, water, and air. They are characterized by their high persistence in the environment and the human body, meaning they do not break down and can accumulate over time. This is a key reason they are often referred to as "forever chemicals." Research indicates that exposure to PFAS may lead to negative health effects for humans, including reproductive and developmental toxicity, as well as adverse impacts on wildlife. Their resistance to degradation, even under extreme conditions such as heat, acids, or bases, further contributes to their bioaccumulation in both wildlife and humans.



The EPA is setting new standards to protect public health from PFAS chemicals in drinking water. For PFOA and PFOS, the EPA's health-based goal (MCLG) is zero, based on science showing that any exposure carries health risks. For other PFAS like PFNA, PFHxS, and GenX, the MCLG is set at 10 parts per trillion. The enforceable Maximum Contaminant Level (MCL) is set at 4 parts per trillion for PFOA and PFOS, and 10 parts per trillion for PFNA, PFHxS, and GenX chemicals. The EPA is regulating mixtures of PFHxS, PFNA, HFPO-DA, and PFBS using a Hazard Index (HI), and has determined it is feasible for the mixture to achieve an HI of 1 or below.

As the research surrounding these problematic lifelong chemicals becomes more expansive, the need for sensitive and specific extraction methods becomes more vital for accurate detection and quantitation. UCT is the 35+ years' premier environmental analysis provider, featuring an extensive range of turnkey solutions, ranging from sample prep columns to QuEChERS configurations, processing stations, and analytical columns.



Enviro-Clean® ECWAX

UCT's Enviro-Clean® WAX SPE cartridges provide a robust solution for the extraction of per- and polyfluoroalkyl substances (PFAS) from environmental water samples. These polymeric weak-anion exchange (WAX) cartridges are designed to deliver superior cleanliness with minimal background interference, making them ideal for matrices such as drinking water, groundwater, surface water, and wastewater. Available in a variety of bed sizes and column capacities, they offer strong reversed-phase interactions and high ion-exchange capacity. The polyethylene frits help eliminate cross-contamination and background noise. These cartridges are used in US EPA Method 533 for extracting multiple PFAS, including short-chain compounds, and in the EPA 1633 method, which targets 40 PFAS.

Enviro-Clean® ECHLD

ECHLD is formulated using highly cross-linked styrene and divinylbenzene (DVB) copolymer, designed for high analyte capacity with lower bed mass compared to traditional silica particles. Enviro-Clean® HLD is a versatile sorbent that effectively retains a wide range of acidic, neutral (polar and non-polar), and basic compounds. These highly retentive sorbents are ideal for applications targeting hydrophobic PFAS compounds in drinking water using US EPA 537.1 for PFAS testing.

Enviro-Clean® Free-Flowing Dual Phase Cartridges

Avoid time-intensive dSPE and cumbersome dual-stacked cartridges with UCT's Enviro-Clean dual phase weak-anion exchange (WAX) + Graphitized Carbon Black (GCB) cartridge, designed to meet the EPA 1633 method-required carbon purication for PFAS testing. This one-step clean-up minimizes the loss of long-chain PFAS compounds. Cartridges are available in two configurations: 200 or 500 mg of WAX atop 50 mg of GCB for aqueous samples and 50 mg of GCB atop 200 or 500 mg of WAX for soil and tissue samples. This approach is quickly becoming the "go-to" method for EPA 1633 sample preparation of both non-potable water and soil.

Enviro-Clean® ECWAX — EPA 533 & EPA 1633

Part Number	Frits	Amount (mg)	Volume (mL)	UoM
ECWAX053-P	PE	50	3	50/Pkg
ECWAX063-P	PE	60	3	50/Pkg
ECWAX116-P	PE	100	6	30/Pkg
ECWAX(150)6-P	PE	150	6	30/Pkg
ECWAX126-P	PE	200	6	30/Pkg
ECWAX156-P	PE	500	6	30/Pkg
ECWAX1525-P	PE	600	25	20/Pkg

Enviro-Clean® ECHLD — EPA 537.1

Part Number	Frits	Amount (mg)	Volume (mL)	UoM
ECHLD116-P	PE	100	6	30/Pkg
ECHLD(150)6-P	PE	150	6	30/Pkg
ECHLD123-P	PE	200	3	50/Pkg
ECHLD126-P	PE	200	6	30/Pkg
ECHLD156-P	PE	500	6	30/Pkg

Enviro-Clean® Dual Phase — DoD QSM 5.3 & EPA 1633

Part Number	Frits	Amount (mg)	Volume (mL)	UoM
ECWAXCB206-P	PE	200 – WAX (top) 50 – GCB (bottom)	6	30/Pkg
ECWAXCB506-P	PE	500 – WAX (top) 50 – GCB (bottom)	6	30/Pkg
ECCBWAX206-P	PE	50 – GCB (top) 200 – WAX (bottom)	6	30/Pkg

	Deionized Water (n=6)			
	Fortified conc = 10 ng/L		Fortified conc = 80 ng/L	
Analyte	Recovery (%)	RSD (%)	Recovery (%)	RSD (%)
PFBA	115.89	9.22	108.04	10.71
PFMPA	102.20	4.71	100.47	1.24
PFPeA	100.93	5.10	100.70	2.33
PFBS	107.67	5.92	108.84	2.09
PFMBA	103.33	5.45	103.18	0.45
PFEESA	101.27	5.28	103.70	1.90
NFDHA	98.07	5.46	95.73	2.29
4:2FTS	107.27	5.89	105.98	1.90
PFHxA	100.47	5.73	102.22	2.34
PFPeS	107.40	5.97	112.27	2.69
HFPO-DA	106.07	7.09	105.08	2.50
PFHPA	106.60	5.01	107.54	1.96
PFHxS	104.13	5.32	106.32	1.35
ADONA	99.87	5.16	99.94	1.76
6:2FTS	127.00	13.24	102.90	1.54
PFOA	106.47	5.74	106.16	1.91
PFHpS	101.07	5.84	99.50	3.68
PFOS	101.73	4.96	100.48	2.05
PFNA	99.93	5.61	99.12	2.60
9Cl-PF3ONS	105.07	5.10	103.32	5.22
PFDA	106.47	4.84	106.89	2.38
8:2FTS	108.93	4.42	108.40	1.94
PFUnA	110.00	5.21	108.53	2.46
11Cl-PF3OUdS	101.07	5.28	97.37	10.74
PFDoA	109.13	4.85	107.22	1.99

	Deionized Water (n=4)			
	Fortified conc = 2.5 ng/L		Fortified conc = 10 ng/L	
Analyte	Recovery (%)	RSD (%)	Recovery (%)	RSD (%)
PFBS	93	5	97	2
PFHxA	82	3	89	2
HFPO-DA	75	4	72	4
PFHpA	81	4	91	1
PFHxS	108	4	96	1
ADONA	77	3	88	1
PFOA	85	4	93	1
PFOS	99	4	90	2
PFNA	82	3	101	1
9Cl-PF3ONS	91	3	98	2
PFDA	84	2	105	1
PFUnA	85	1	106	1
11Cl-PF3OUdS	88	4	95	2
PFDoA	81	3	93	1
N-EtFOSAA	77	4	81	2
N-MeFOSAA	108	2	87	3
PFTA	80	2	93	2
PFTrDA	79	5	89	1
PFBS	93	5	97	2
PFHxA	82	3	89	2
HFPO-DA	75	4	72	4

Since 2012, the FDA has refined its analytical methods to test PFAS in specific food groups, focusing on foods grown or produced in areas with known environmental contamination. In 2019, the FDA introduced the first single lab validated method using a UCT QuEChERS approach to test 16 different types of PFAS in a wide variety of foods, including fruits, vegetables, bread, dairy, and meat.

By 2024, the FDA expanded this method, increasing the number of detectable PFAS compounds from 16 to 30. This expanded method allows for more comprehensive PFAS monitoring in the general food supply and foods from potentially contaminated areas. The FDA continues to provide technical assistance to states, with additional testing planned for seafood and bottled water. Collaborating with federal and state agencies, the FDA is also researching how PFAS is taken up by plants, aiming to reduce dietary exposure. Additionally, the agency has negotiated voluntary market phase-outs of certain PFAS in food contact substances to minimize health risks.

Target compounds in the FDA C-010.03 method:
Determination of 30 PFASs in food & feed using LC-MS/MS

PFBA	Perfluorobutanoic acid	PFOS	Perfluorooctanesulfonic acid
PFPeA	Perfluoropentanoic acid	PFNS	Perfluorononanesulfonic acid
PFHxA	Perfluorohexanoic acid	PFDS	Perfluorodecanesulfonic acid
PFHpA	Perfluoroheptanoic acid	PFUnDS	Perfluoroundecanesulfonic acid
PFOA	Perfluorooctanoic Acid	PFDoS	Perfluorododecanesulfonic acid
PFNA	Perfluorononanoic acid	PFTrDS	Perfluorotridecanesulfonic acid
PFDA	Perfluorodecanoic acid	FOSA	Perfluorooctanesulfonamide
PFUnA	Perfluoroundecanoic acid	DONA	4,8-Dioxa-3H-perfluorononanoic acid
PFDoA	Perfluorododecanoic acid	HFPO-DA	Hexafluoropropylene oxide dimer acid
PFTrDA	Perfluorotridecanoic acid	9Cl-PF3ONS	9-Chlorohexafluoro-3-oxanonane-1-sulfonic acid
PFTeDA	Perfluorotetradecanoic acid	11Cl-PF3OUdS	11-Chloroicosafluoro-3-oxaundecane-1-sulfonic acid
PFBS	Perfluorobutanesulfonic acid	4:2 FTS	1H,1H, 2H, 2H-Perfluorohexane sulfonic acid
PFPeS	Perfluoropentanesulfonic acid	6:2 FTS	1H,1H, 2H, 2H-Perfluorooctane sulfonic acid
PFHxS	Perfluorohexanesulfonic acid	8:2 FTS	1H,1H, 2H, 2H-Perfluorodecane sulfonic acid
PFHpS	Perfluoroheptanesulfonic acid	10:2 FTS	1H,1H, 2H, 2H-Perfluorododecane sulfonic acid

UCT QuEChERS Products Featured in the FDA Validated Method

Part Number	Description	UoM
ECMSSCFS-MP	QuEChERS 1500 mg NaCl/6000 mg $MgSO^4$, mylar pouch only	50/Pkg
ECMPSCB-MP	QuEChERS 900 mg $MgSO_4$ /300 mg PSA/150 mg GCB, mylar pouch only	50/Pkg
ECMPSCB15CT	QuEChERS 900 mg $MgSO_4$ /300 mg PSA/150 mg GCB, 15 mL centrifuge tube	50/Pkg

UCT's PFAS Glass Block Vacuum Manifold System is designed to deliver superior performance in PFAS (Per- and polyuoroalkyl substances) testing. With carefully selected components, the system is tailored to provide minimal background, making it an ideal solution for laboratories focused on clean and reliable extractions. Capable of handling large-volume samples or processing multiple samples simultaneously, the system provides a cost-effective, efficient, and flexible approach to extractions. Extensive evaluation of every component in the Glass Block Vacuum Manifold System was conducted to ensure compliance with the laboratory standards for PFAS testing.

Features and Benefits

Corian® lid with Luer Fittings
Resists warping even with prolonged use, ensuring durability and long-term performance. Bulkhead luer fittings allow direct sample elution into disposable test tubes.

Multiple Position Options
Available in 10, 16, or 24 positions, featuring two parallel rows with corner leg supports to prevent damage to luers and tips.

Clear Glass Block
Vacuum chamber made from glass for easy visual inspection of the extraction process. Simplifies cleaning and offers convenience.

Vacuum Control and Monitoring
The integrated vacuum control valve optimizes sample flow rates, while the vacuum gauge and bleed valve allow for easy and precise monitoring of vacuum pressure.

Chemically Resistant Polypropylene Racks
Designed to accommodate 12-13 mm or 16 mm disposable test tubes, these racks are highly resistant to chemical degradation, ensuring years of dependable use.

PFAS-Safe Components
Each part, including collection racks, sample transfer tubes, stopcocks, Corian® lid, SPE adapter, vacuum gauge assembly, and the glass block, has been rigorously tested to minimize PFAS contamination.

Cost-Effective and Flexible
A highly affordable alternative to automated systems, this manual vacuum manifold allows the simultaneous extraction of multiple samples and supports large sample volumes, offering both flexibility and efficiency.

A complete Vacuum Manifold System consists of a glass block, Corian® manifold lid, a cover gasket, vacuum gauge and assembly, sample delivery tips, an adjustable collection rack, bulkhead luer fittings, plugs and a glass block safety tray.

PFAS Glass Block Manifold System

Part Number	Description
VMF010GL-PFAS	Complete 10 Position Vacuum Manifold System – PFAS Analysis
VMF016GL-PFAS	Complete 16 Position Vacuum Manifold System – PFAS Analysis
VMF024GL-PFAS	Complete 24 Position Vacuum Manifold System – PFAS Analysis

Accessories Available for Purchase Separately

Part Number	Description	Units
VMFSTFR01-LLDPE	Large Volume Sample Transfer Tubes (Each)	1
VMFSTFR06-LLDPE	Large Volume Sample Transfer Tubes (6 ct)	6
VMFSTFR12-LLDPE	Large Volume Sample Transfer Tubes (12 ct)	12
VMF02110-PFAS	PFAS Stopcocks (10 ct)	10
VMF02116-PFAS	PFAS Stopcocks (16 ct)	16
VMF02024-PFAS	PFAS Stopcocks (24 ct)	24
AD0000AS	Adapter for stacking 1, 3, 6, 10 & 15 mL reservoirs (15 ct)	15
AD00000C	Adapter for stacking 1, 3, 6, 10 & 15 mL reservoirs (100 ct)	100
ECROCKER400	Vacuum pump – 110 volt	1
ECROCKER400-220	Vacuum pump – 220 volt	1
ECUCTTRAP20	Waste Trap, cap & hoses	1

The EPA has determined minimum reporting levels (MRLs) for the 29 PFAS compounds covered under UCMR 5. These MRLs range from 0.002 to 0.02 µg/L (parts per billion), which is equivalent to 2 to 20 ng/L (parts per trillion).

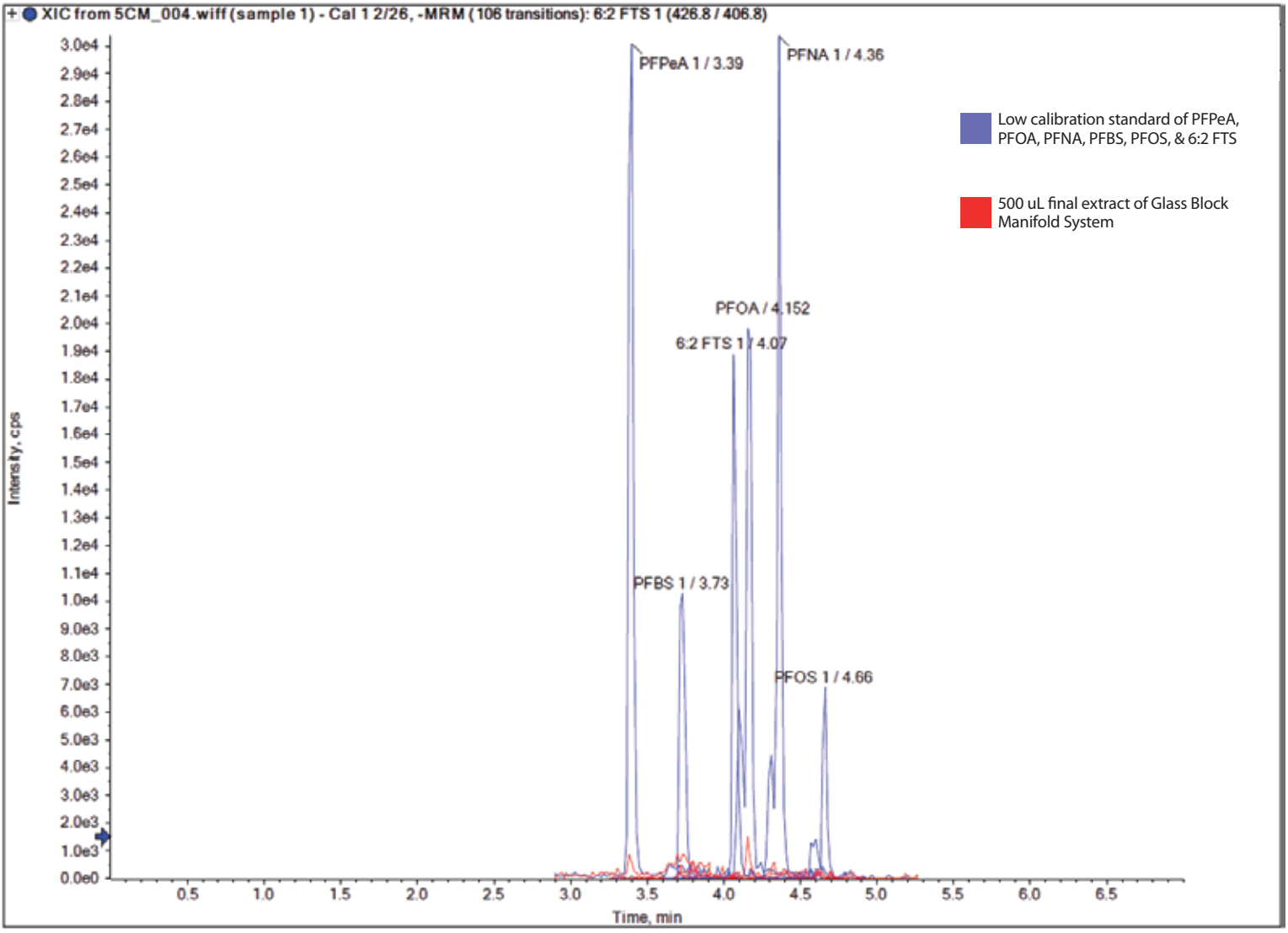
After rinsing the components according to EPA method requirements, all parts were found to have PFAS levels below the 1/3 UCMR 5 MRL threshold of 0.66 ppt in a 250 mL water sample, for the 40 PFAS currently analyzed under EPA methods.

Component	UCMR 5	EPA Method 537.1	EPA Method 533	EPA Method 1633	GBM System Evaluation Results
11Cl-PF3OUdS	✔	✔	✔	✔	ND
3:3 FTCA				✔	ND
4:2 FTS	✔		✔	✔	ND
5:3 FTCA				✔	ND
6:2 FTS	✔		✔	✔	<0.66 ng/L
7:3 FTCA				✔	ND
8:2 FTS	✔		✔	✔	ND
9Cl-PF3ONS	✔	✔	✔	✔	ND
ADONA	✔	✔	✔	✔	ND
HFPO-DA	✔	✔	✔	✔	ND
NEtFOSA				✔	ND
NEtFOSAA	✔	✔		✔	ND
NEtFOSE				✔	ND
NFDHA	✔		✔	✔	ND
NMeFOSA				✔	ND
NMeFOSAA	✔	✔		✔	ND
NMeFOSE				✔	ND
PFBA	✔		✔	✔	ND
PFBS	✔	✔	✔	✔	<0.66 ng/L
PFDA	✔	✔	✔	✔	ND

Component	UCMR 5	EPA Method 537.1	EPA Method 533	EPA Method 1633	GBM System Evaluation Results
PFDoA	✔	✔	✔	✔	ND
PFDoS				✔	ND
PFDS				✔	ND
PFEESA	✔		✔	✔	ND
PFHpA	✔	✔	✔	✔	ND
PFHpS	✔		✔	✔	ND
PFHxA	✔	✔	✔	✔	ND
PFHxS	✔	✔	✔	✔	ND
PFMBA	✔		✔	✔	<0.66 ng/L
PFMPA	✔		✔	✔	ND
PFNA	✔	✔	✔	✔	ND
PFNS				✔	ND
PFOA	✔	✔	✔	✔	ND
PFOS	✔	✔	✔	✔	ND
PFOSA				✔	ND
PFPeA	✔		✔	✔	<0.66 ng/L
PFPeS	✔		✔	✔	ND
PFTeDA	✔	✔		✔	ND
PFTrDA	✔	✔		✔	ND
PFUnA	✔	✔	✔	✔	ND

*Solvent Subtraction Applied
ND = None Detected

In addition to assessing the complete system, individual components were also evaluated for their compatibility with PFAS testing. The components tested include the Manifold Lid, Collection Racks, Vacuum Gauge, Column Adapters, Sample Transfer Tubes, and Stopcocks. The smaller parts of some larger components were also examined. None of these parts produced a concentration above 0.66 ng/L.



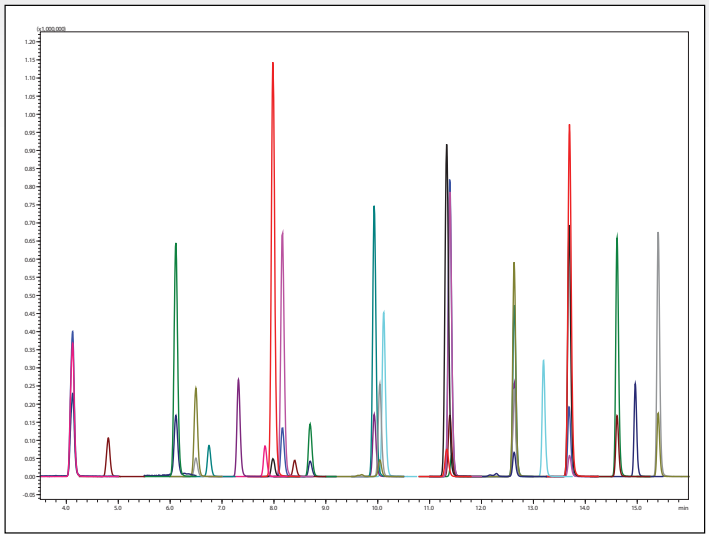
Chromatogram comparison of PFAS Glass Block Manifold System rinse vs Low calibration PFAS standard mix

UCT's Selectra® and SelectraCore® C18 columns provide reliable, cost-effective solutions that maximize resolution and sensitivity for PFAS analysis. We also offer corresponding delay columns to capture any unwanted background contamination in the mobile phase, solvent lines, and online degassers. End-users can separate PFAS contamination peaks from the true PFAS levels being identified within their samples.

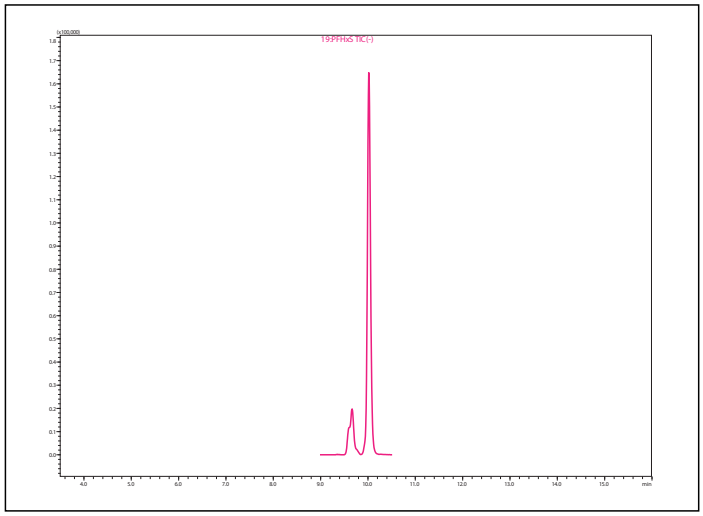
Brand	Part Number	Length	ID	Particle Size	Type
Selectra®	SLC-1850ID21-18UM	50 mm	2.1 mm	1.8 µm	Analytical Column
Selectra®	SLC-18100ID21-18UM	100 mm	2.1 mm	1.8 µm	Analytical Column
Selectra®	SLC-18150ID21-18UM	150 mm	2.1 mm	1.8 µm	Analytical Column
Selectra®	SLC-18GDC20-18UMOPT	5 mm	2.1 mm	1.8 µm	Guard Column
Selectra®	SLC-1850ID21-3UM	50 mm	2.1 mm	3 µm	Analytical Column
Selectra®	SLC-18100ID21-3UM	100 mm	2.1 mm	3 µm	Analytical Column
Selectra®	SLC-18150ID21-3UM	150 mm	2.1 mm	3 µm	Analytical Column
Selectra®	SLC-18GDC20-3UM	10 mm	2.1 mm	3 µm	Guard Column
Selectra®	SLC-1850ID21-5UM	50 mm	2.1 mm	5 µm	Analytical Column
Selectra®	SLC-18100ID21-5UM	100 mm	2.1 mm	5 µm	Analytical Column
Selectra®	SLC-18GDC20-5UM	10 mm	2.1 mm	5 µm	Guard Column
SelectraCore®	SCS27-C18521	50 mm	2.1 mm	2.7 µm	Analytical Column
SelectraCore®	SCS27-C181021	100 mm	2.1 mm	2.7 µm	Analytical Column
SelectraCore®	SCS27-C181521	150 mm	2.1 mm	2.7 µm	Analytical Column
SelectraCore®	SCS27-C18GDC21	5 mm	2.1 mm	2.7 µm	Guard Column
Selectra®	SLC-1850ID46-5UM	50 mm	4.6 mm	5 µm	Delay Column
Selectra®	SLGRDHLDR	For 3.0 µm & 5.0 µm Selectra® Columns			Guard Cartridge Holder
Selectra®	SLGRDHLDR-HPOPT	For 1.8 µm Selectra® & all SelectraCore® columns			Guard Cartridge Holder

Chromatogram for EPA Method 533

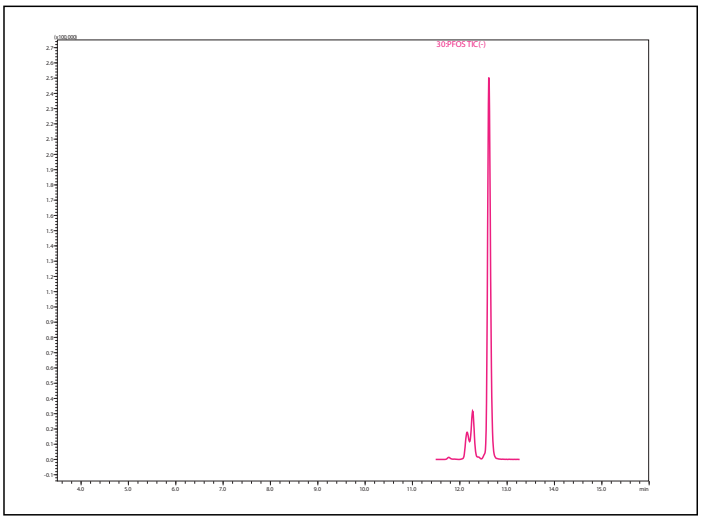
Analyte	RT (min)	Calibration Curve Range (µg/L)	(R^2)
PFBA	4.11	0.5 - 25	0.9984
PFMPA	4.79	0.5 - 25	0.9977
PFEPA	6.03	0.5 - 25	0.9989
PFBS	6.47	0.5 - 25	0.9985
PFMPA	6.72	0.5 - 25	0.9984
PFESA	7.29	0.5 - 25	0.9975
NFDHA	7.80	0.5 - 25	0.9987
4:2FTS	7.98	0.5 - 25	0.9994
PFHxA	8.14	0.5 - 25	0.9987
PFPeS	8.37	0.5 - 25	0.9978
HFPO-DA	8.87	0.5 - 25	0.9986
PFHpA	9.90	0.5 - 25	0.9987
PFHxS	10.01	0.5 - 25	0.9992
ADONA	10.09	0.5 - 25	0.9982
6:2FTS	11.11	0.5 - 25	0.9991
PFOA	11.37	0.5 - 25	0.9976
PFOS	12.61	0.5 - 25	0.9979
PFNA	12.82	0.5 - 25	0.9988
9Cl-PF3ONS	13.19	0.5 - 25	0.9986
PFDA	13.80	0.5 - 25	0.9988
8:2FTS	13.88	0.5 - 25	0.9989
PFUnA	14.81	0.5 - 25	0.9984
11Cl-PF3OUdS	15.01	0.5 - 25	0.9977
PFDoA	15.40	0.5 - 25	0.9980
Isotope Performance Standards			
^{13}C-PFBA	4.11	0.5 - 25	-
^{13}C-PFOA	11.36	0.5 - 25	-
^{13}C-PFOS	12.61	0.5 - 25	-
Isotope Dilution Standards			
^{13}C-PFBA	4.11	0.5 - 25	-
^{13}C-PFPeA	6.09	0.5 - 25	-
^{13}C-PFBS	6.47	0.5 - 25	-
^{13}C-4:2FTS	7.98	0.5 - 25	-
^{13}C-PFHxA	8.13	0.5 - 25	-
^{13}C-HFPO-DA	8.87	0.5 - 25	
^{13}C-PFHxS	10.01	0.5 - 25	-
^{13}C-6:2FTS	11.31	0.5 - 25	-
^{13}C-PFOA	11.36	0.5 - 25	-
^{13}C-PFOS	12.61	0.5 - 25	-
^{13}C-PFDA	13.88	0.5 - 25	
^{13}C-8:2FTS	13.68	0.5 - 25	-
^{13}C-PFUnA	14.81	0.5 - 25	-
^{13}C-PFDoA	15.40	0.5 - 25	-



PFAS fortified at low fortification level 10 ng/L in reagent water (2.5 ng/mL in vial).

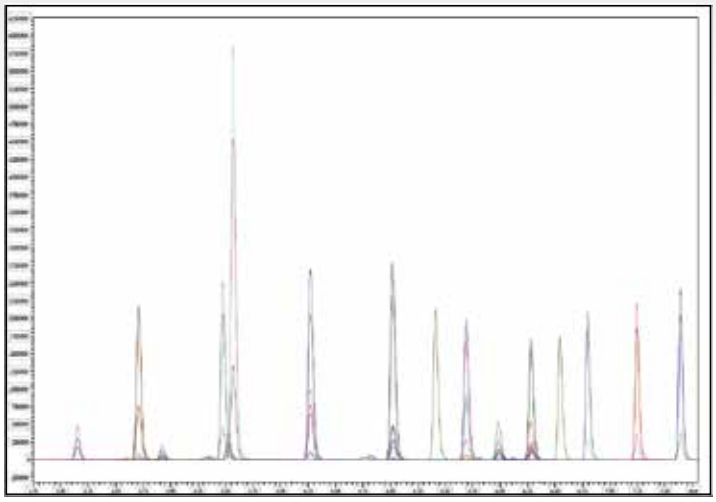


Chromatogram showing baseline separation of PFHxS isomers (branched vs linear)



Chromatogram showing baseline separation of PFOS isomers (branched vs linear)

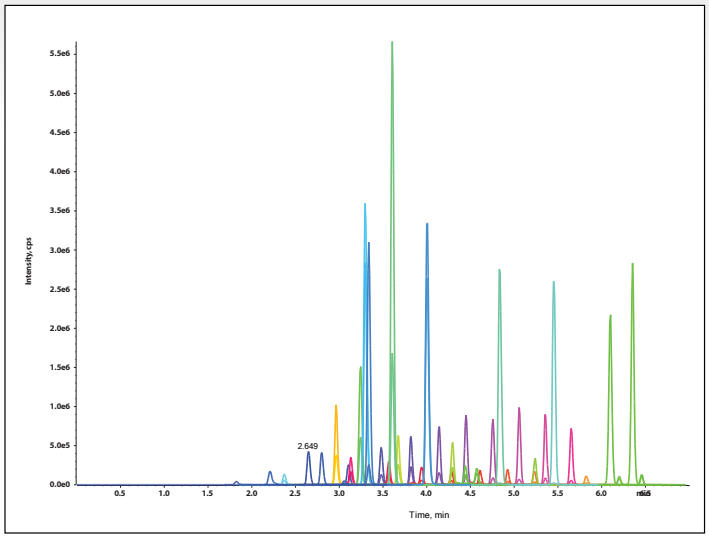
Analyte	RT (min)	Calibration Curve Range (µg/L)	(R^2)
PFBS	2.13	0.5 - 5	0.9989
PFHxA	2.67	0.5 - 5	0.9971
HFPO-DA	2.89	0.5 - 5	0.9986
PFHpA	3.42	0.5 - 5	0.9987
PFHxS	3.47	0.5 - 5	0.9979
ADONA	3.52	0.5 - 5	0.9982
PFOA	4.21	0.5 - 5	0.9976
PFOS	4.95	0.5 - 5	0.9979
PFNA	4.95	0.5 - 5	0.9978
9Cl-PF3ONS	5.33	0.5 - 5	0.9980
PFDA	5.61	0.5 - 5	0.9988
PFUnA	6.19	0.5 - 5	0.9984
11Cl-PF3OUdS	6.45	0.5 - 5	0.9977
PFDoA	6.70	0.5 - 5	0.9980
NEtFOSAA	6.20	0.5 - 5	0.9967
NMeFOSAA	5.90	0.5 - 5	0.9989
PFTrDA	7.14	0.5 - 5	0.9918
PFTA	7.53	0.5 - 5	0.9981
Isotope Performance Standards			
$^{12}C2$-PFOA	4.21	0.5 - 5	-
$^{13}C4$-PFOS	4.95	0.5 - 5	-
d_3-NMeFOSAA	5.90	0.5 - 5	-
Surrogate Standards			
$^{13}C_2$-PFHxA	2.67	0.5 - 5	-
$^{13}C_2$-PFDA	5.61	0.5 - 5	-
d_5-NEtFOSAA	6.19	0.5 - 5	-
$^{13}C_3$-HFPO-DA	2.89	0.5 - 5	-



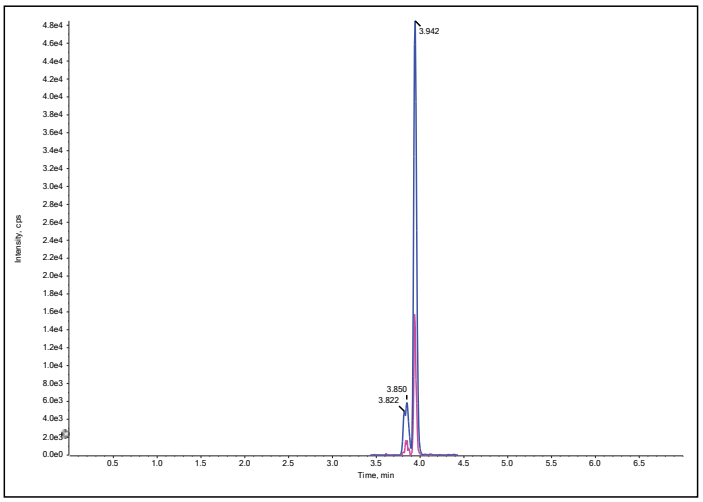
PFAS fortified at high fortification level 10 ng/L in reagent water (10 ng/mL in vial)

Analyte	RSD (%)	Linear Range (ng/mL)	
PFBA	10.4	0.8	50
PFPeA 1	11.9	0.4	25
PFHxA 1	12.9	0.2	12.5
PFHpA 1	12.9	0.2	12.5
PFOA 1*	14.7	0.2	12.5
PFNA 1	10.8	0.2	12.5
PFDA 1	7.6	0.2	12.5
PFUnA 1	10.5	0.2	12.5
PFDoA 1	9.3	0.2	12.5
PFTrDA 1	10.5	0.2	12.5
PFTeDA 1	10.2	0.2	12.5
PFBS 1	10.7	0.2	12.5
PFPeS 1	9.2	0.2	12.5
PFHxS 1	5.0	0.2	12.5
PFHpS 1	5.8	0.2	12.5
PFOS 1	10.7	0.2	12.5
PFNS 1	11.0	0.2	12.5
PFDS 1	11.9	0.2	12.5
PFDoS 1	9.9	0.2	12.5
4:2 FTS 1	10.3	0.8	50
6:2 FTS 1	10.9	0.8	50
8:2 FTS 1	8.1	0.8	50
PFOSA 1	11.2	0.2	12.5
NMeFOSA 1	14.0	0.2	12.5
NEtFOSA 1	8.4	0.2	12.5
NMeFOSAA 1	11.1	0.2	12.5
NEtFOSAA 1	12.5	0.2	12.5
NMeFOSE 1	8.0	2	125
NEtFOSE 1	9.3	2	125
HFPO-DA 1	9.3	0.8	50
ADONA 1	12.2	0.8	50
9Cl-PF3ONS 1	10.3	0.8	50
11Cl-PF3OUdS 1	11.8	0.8	50
3:3 FTCA 1	11.6	1	62.4
5:3 FTCA 1	11.8	5	312
7:3 FTCA 1	11.7	5	312
PFEESA 1	13.3	0.4	25
PFMPA 1	13.5	0.4	25
NFDHA 1	14.4	0.4	25

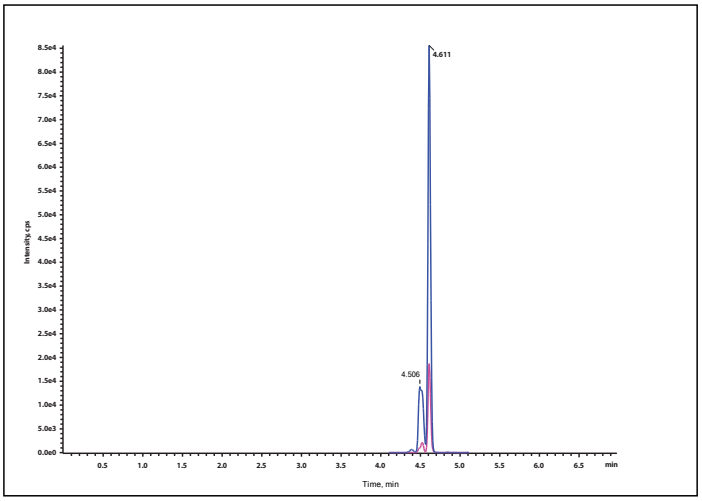
* Linear regression, RSE presented in this table



Target Analytes at low concentration
(In the range of 0.2 - 5.0 ng/mL)



Isomer Separation PFHxS (at 2.5 ng/mL)



Isomer Separation PFOS (at 1.25 ng/mL)

PRICES AND TERMS

Our prices are subject to change without notice. The price in effect when we receive your order will apply. All prices are in US Dollars and are F.O.B. Lewistown, PA 17044. Terms of payment are net 30 days.

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We welcome all orders, therefore, we do not have a minimum order requirement. When ordering, please include your purchase order number, complete "Ship To" and "Bill To" address, catalog number, quantity, and description of product(s). Also include your name and a phone number where you can be reached should we have any questions concerning your order.

SHIPMENTS

Normal processing is within 24 hours after receipt of an order. Unless special shipping requests have been made, our trained staff will send all orders by UPS Ground service. The appropriate shipping charges (freight & insurance costs) will be added to the invoice, unless otherwise instructed by the customer.

SPECIAL PRICING

We offer special pricing for volume purchases and standing orders. These discounts apply to bonded phase extraction column purchases only. Please call a sales representative for more information on special pricing qualifications.

RETURN POLICY

Our Quality Manager will handle all returns. Before returning merchandise, please call to obtain a return authorization number from the quality manager. We will need to know the reason for the return, date of purchase, purchase order number and invoice number in order to issue a return authorization number. Return merchandise must be received before a credit can be issued. Returns will not be accepted after 90 days. A restocking fee of 25% of the price paid, or a minimum of $25.00 (whichever is greater) will be charged on all returns.

WARRANTY

All products manufactured by UCT are guaranteed against defects in materials and workmanship for a period of 90 days after shipment. UCT will replace any items that prove to be defective during this time period. The exclusive remedy requires the end user to first advise UCT of the defective product by phone or in writing and must include order number, the lot number and the shipping date. To initiate this action, photographs of the product, including packaging and labeling of the containers, must be submitted to the UCT Representative for approval. With approval a return authorization can be initiated, and must be received within 30 days. Once the materials arrive at UCT a further inspection of the materials must be completed and accepted by our Quality Manager prior to further action of credits or replacement. UCT's total liability is limited to the replacement cost of UCT products. This warranty does not apply to damage resulting from misuse.

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