

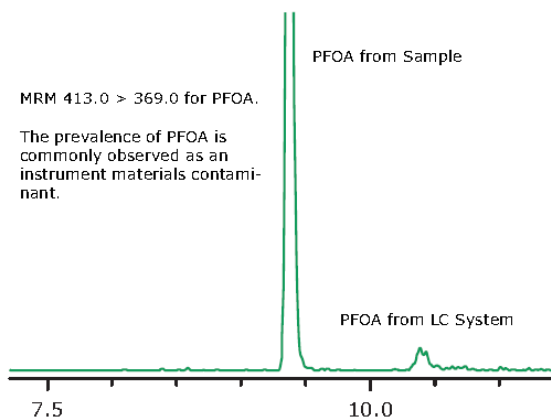
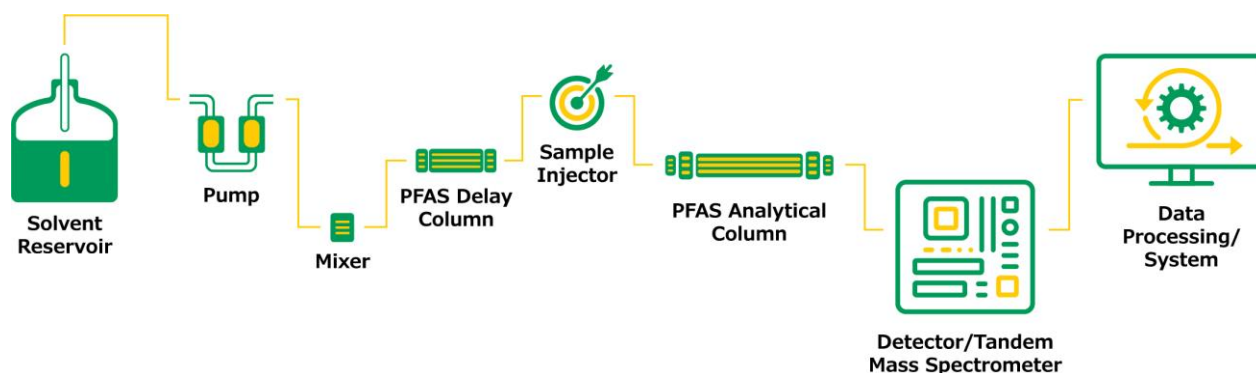
Ascentis® Express PFAS

LC-MS Analysis of PFAS Compounds in EPA 537.1, 533 and 8327

PFAS (Per- and poly-fluoroalkyl substances) are persistent, man-made organic compounds, widely found in the environment. Recent awareness has brought attention to the toxicity of these substances. The U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) have initiated actions against PFAS. For determination of PFASs, liquid chromatography–mass spectrometry (LC-MS) is a commonly used technique. EPA has developed, validated, and published three methods to support the analysis of 29 PFAS in drinking water, Method 533, 537 and 537.1. EPA 8327 covers the analysis of selected per- and polyfluoroalkyl substances (PFAS) in prepared extracts of various matrices (e.g., waters and solids) by liquid chromatography/tandem mass spectrometry (LC/MS/MS) analysis.



The Ascentis® Express PFAS HPLC column is designed for the separation of novel and legacy short chain and long chain PFAS compounds containing branched and linear isomers, whilst adhering to EPA methodology requirements. Furthermore, a specific PFAS delay column prevents background PFAS contamination from interfering with the sample results in quantitative LC-MS methods.



The highly retentive endcapped silane of the **Ascentis® Express PFAS Delay column** provides high retention of PFAS compounds across various mobile phase conditions and is used to delay background instrument PFAS contamination from interference with analyzed samples. For this reason, the Ascentis® Express PFAS Delay column is placed upstream of the sample injector and after the mixer.



EPA 537.1

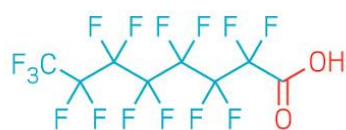
LC Conditions:

Analytical Column: Ascentis Express PFAS, 2.7 μ m,
10cm x 2.1mm, 90A
Part Number: 53559-U
Delay Column: Ascentis Express PFAS Delay, 2.7 μ m,
5cm x 3mm
Part Number: 53572-U
Mobile Phase A: 10 mM Ammonium Acetate
Mobile Phase B: Methanol
Flow Rate: 0.4 mL/min
Pressure: 485 bar
Temperature: 35 °C
Injection Volume: 2.0 μ L
Sample Solvent: Methanol (96%) Water (4%)

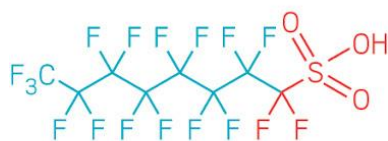
Gradient:	Time	%B
	0.0	33.0
	18.0	98.0
	18.1	100.0
	21.0	100.0
	21.1	33.0
	26.0	End

MS Conditions:

Detection: -ESI MS/MS
LC System: Shimadzu Nexera X2
ESI LCMS system: Shimadzu LCMS-8040
Spray Voltage: -2.0 kV
Nebulizing gas: 2 L/min
Drying gas: 15 L/min
DL temp: 250 °C
Heat Block: 400 °C

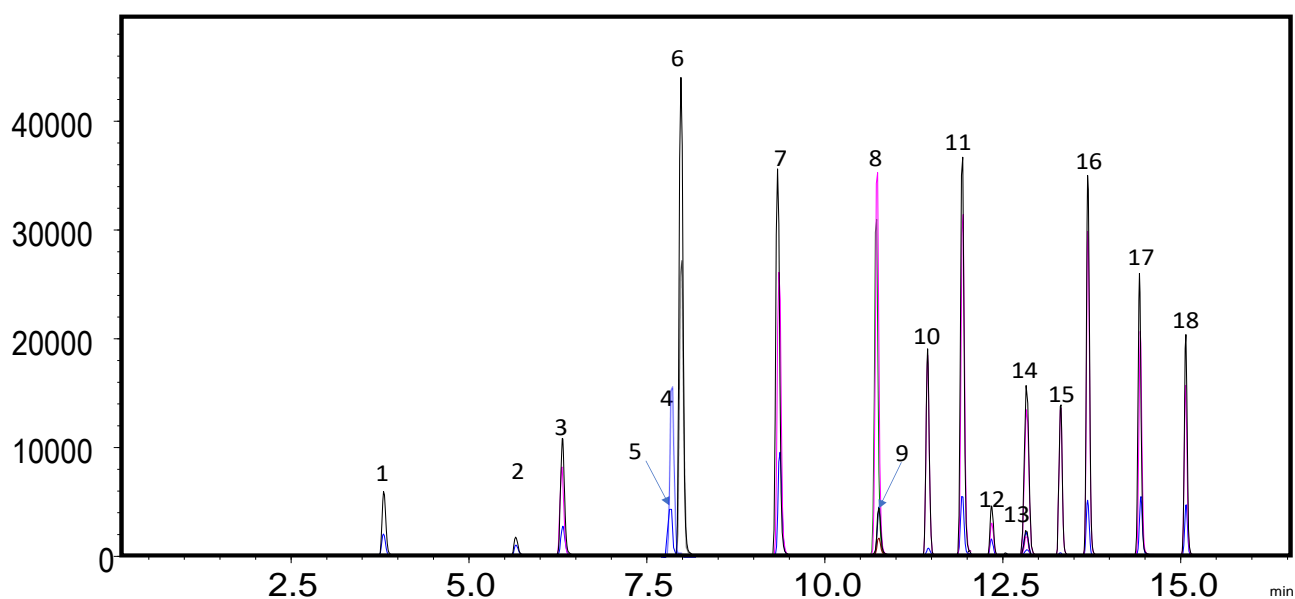


**Perfluorooctanoic acid,
PFOA,
CAS 335-67-1**



**Perfluorooctane
sulfonic acid,
PFOS,
CAS 1763-23-1**

Peak Number	Compound	Transition	Retention Time (min)
1	PFBS	2990000>800000	3.789
2	PFHxA	3130000>2690000	5.639
3	HFPO-DA	2850000>1690000	6.307
4	PFHpA	3630000>3190000	7.723
5	PFHxS	3990000>800000	7.936
6	ADONA	3770000>2509000	7.978
7	PFOA	4130000>3690000	9.368
8	PFNA	4630000>4190000	10.715
9	PFOS	4990000>800000	10.762
10	9Cl-PF3ONS	5309000>3510000	11.439
11	PFDA	5130000>4690000	11.857
12	N-MeFOSAA	5700000>4190000	12.336
13	PFUnA	5630000>5190000	12.822
14	N-EtFOSAA	5840000>4190000	12.827
15	11Cl-PF3OUdS	6307000>4510000	13.311
16	PFDoA	6130000>5690000	13.690
17	PFTTrDA	6630000>6190000	14.435
18	PFTeDA	7130000>6690000	15.083



EPA 533

LC Conditions:

Analytical Column: Ascentis Express PFAS, 2.7 μ m, 10cm x 2.1mm, 90A Gradient:

Part Number: 53559-U

Delay Column: Ascentis Express PFAS Delay, 2.7 μ m, 5cm x 3mm

Part Number: 53572-U

Mobile Phase A: 10 mM Ammonium Acetate

Mobile Phase B: Methanol

Flow Rate: 0.4 mL/min

Pressure: 485 bar

Temperature: 35 °C

Injection Volume: 2.0 μ L

Sample Solvent: Methanol (96%) Water (4%)

MS Conditions:

Detection: -ESI MS/MS

LC System: Shimadzu Nexera X2

ESI LCMS system: Shimadzu LCMS-8040

Spray Voltage: -2.0 kV

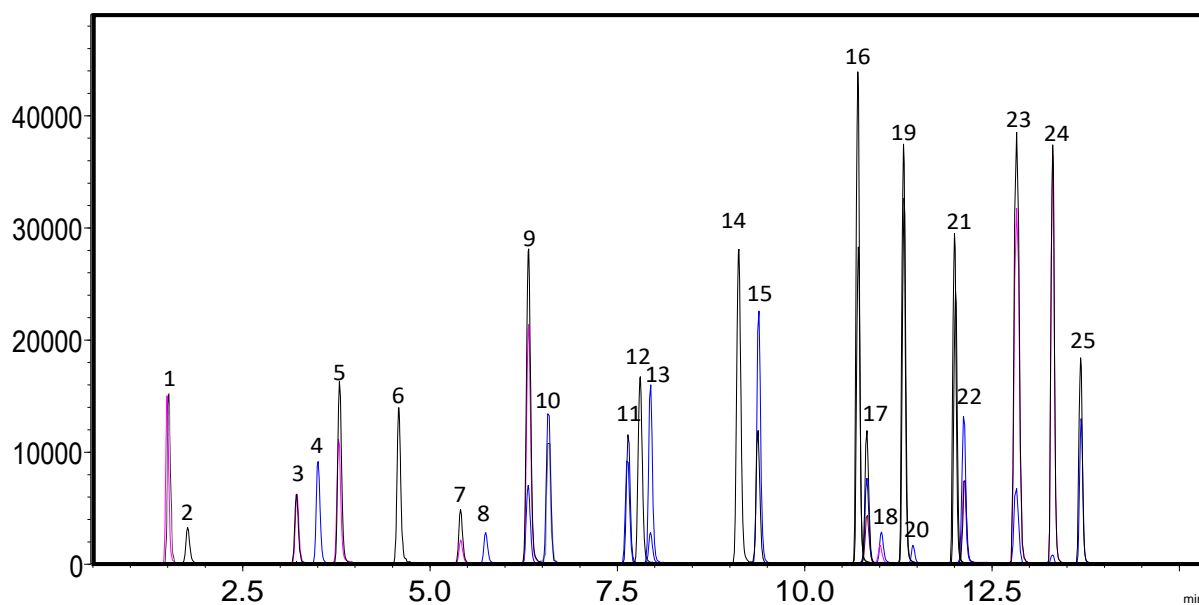
Nebulizing gas: 2 L/min

Drying gas: 15 L/min

DL temp: 250 °C

Heat Block: 400 °C

Time	%B
0.0	33.0
18.0	98.0
18.1	100.0
21.0	100.0
21.1	33.0
26.0	End



Peak Number	Compound	Transition	Retention Time (min)	Peak Number	Compound	Transition	Retention Time (min)
1	PFBA	2130000>1690000	1.358	14	PFOA	4130000>3690000	9.398
2	4:2FTS	2290000>850000	1.890	15	PFMBA	4490000>800000	9.512
3	PFPeA	2630000>2190000	3.219	16	PFNA	4630000>4190000	10.751
4	PFBS	2990000>800000	3.810	17	PFOS	4990000>800000	10.793
5	PFHpS	2790000>850000	3.967	18	9Cl-PF3ONS	5309000>3510000	11.459
6	PFPeS	3150000>1350000	4.791	19	PFDA	5130000>4690000	11.885
7	PFMPA	3270000>3070000	5.431	20	8:2FTS	5490000>800000	11.897
8	PFHxA	3130000>2690000	5.684	21	6:2FTS	4980000>780000	12.680
9	PFEESA	3490000>800000	6.099	22	NFDHA	5990000>800000	12.847
10	HFPO-DA	2850000>1690000	6.335	23	PFUnA	5630000>5190000	12.862
11	PFHpA	3630000>3190000	7.763	24	11Cl-PF3OUdS	6307000>4510000	13.329
12	PFHxS	3990000>800000	7.985	25	PFDoA	6130000>5690000	13.708
13	ADONA	3770000>2509000	8.012				

EPA 8327

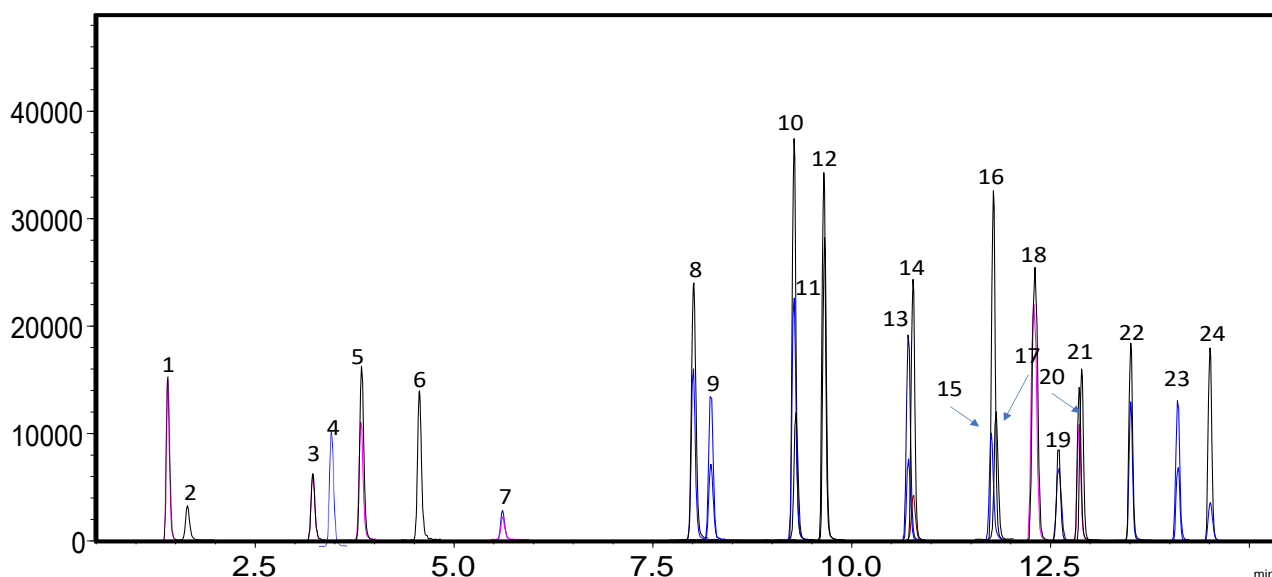
LC Conditions:

Analytical Column: Ascentis Express PFAS, 2.7µm, 10cm x 2.1mm, 90A
 Part Number: 53559-U
 Delay Column: Ascentis Express PFAS Delay, 2.7µm, 5cm x 3mm
 Part Number: 53572-U
 Mobile Phase A: 10 mM Ammonium Acetate
 Mobile Phase B: Methanol
 Flow Rate: 0.4 mL/min
 Pressure: 485 bar
 Temperature: 35 °C
 Injection Volume: 2.0 µL
 Sample Solvent: Methanol (96%) Water (4%)

MS Conditions:

Detection: -ESI MS/MS
 LC System: Shimadzu Nexera X2
 ESI LCMS system: Shimadzu LCMS-8040
 Spray Voltage: -2.0 kV
 Nebulizing gas: 2 L/min
 Drying gas: 15 L/min
 DL temp: 250 °C
 Heat Block: 400 °C

Time	%B
0.0	33.0
18.0	98.0
18.1	100.0
21.0	100.0
21.1	33.0
26.0	End



Peak Number	Compound	Transition	Retention Time (min)	Peak Number	Compound	Transition	Retention Time (min)
1	PFBA	2130000>1690000	1.358	13	PFNA	4630000>4190000	10.751
2	4:2FTS	2290000>850000	1.890	14	PFOS	4990000>800000	10.793
3	PFPeA	2630000>2190000	3.219	15	PFNS	5270000>5070000	11.843
4	PFBS	2990000>800000	3.810	16	PFDA	5130000>4690000	11.885
5	PFHpS	2790000>850000	3.967	17	8:2FTS	5490000>800000	11.897
6	PFPeS	3150000>1350000	4.791	18	N-MeFOSAA	5700000>4190000	12.366
7	PFHxA	3130000>2690000	5.684	19	6:2FTS	4980000>780000	12.680
8	PFHpA	3630000>3190000	7.763	20	PFUnA	5630000>5190000	12.862
9	PFHxS	3990000>800000	7.985	21	N-EtFOSAA	5840000>4190000	12.865
10	FOSA	4270000>4070000	9.304	22	PFDaA	6130000>5690000	13.708
11	PFOA	4130000>3690000	9.398	23	PFTrDA	6630000>6190000	14.446
12	PFDS	2950000>2010000	9.695	24	PFTeDA	7130000>6690000	15.103
1	PFBA	2130000>1690000	1.358				