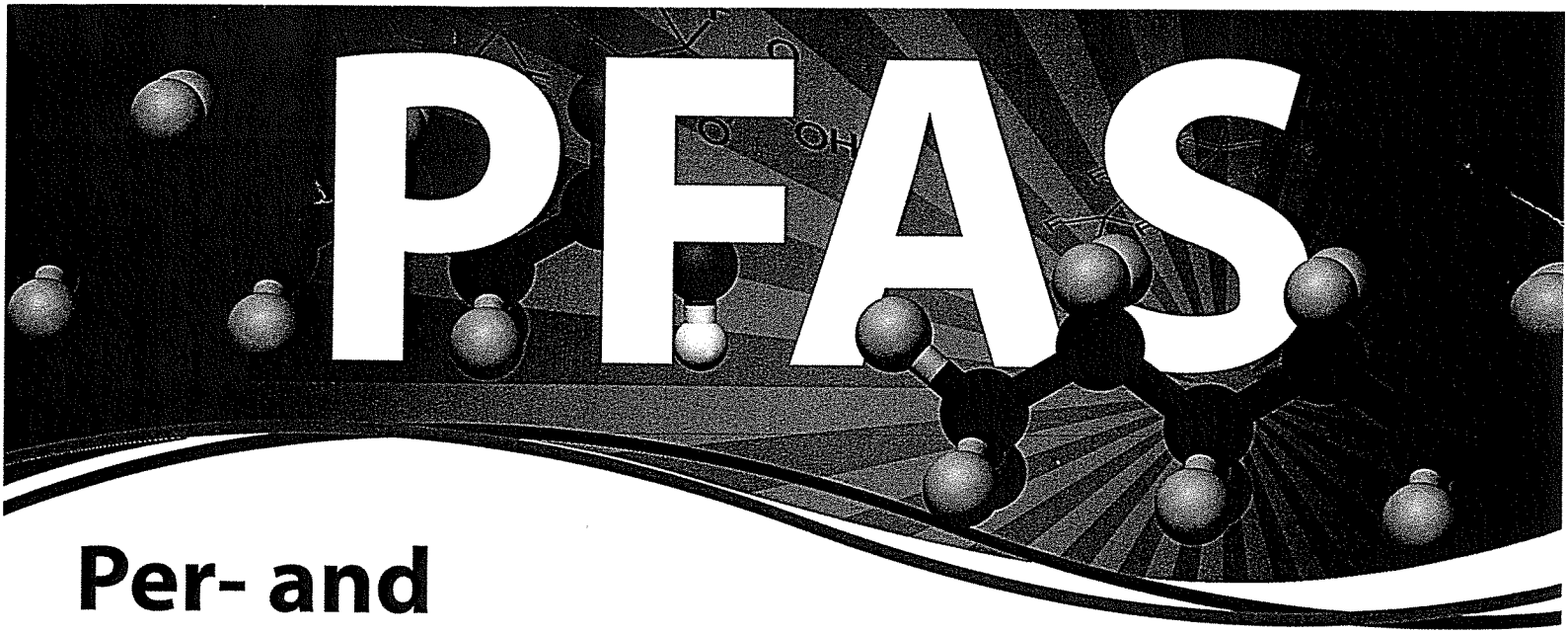

Per- and Polyfluoroalkyl Substances (PFAS)

TestAmerica has 20 years' experience analyzing samples for PFAS chemicals. With multiple laboratories within the TestAmerica network performing emerging contaminant testing, our PFAS offerings provide the flexibility you need to meet your unique project requirements.

PFAS are a family of synthetic compounds containing thousands of chemicals formed from carbon (C) chains with fluorine (F) attached to these chains. The CF bond is the shortest and strongest bond in nature, and is responsible for most of the unique and useful characteristics of these compounds. These chemicals are used in a wide variety of industrial and commercial products such as textiles, aqueous film forming foams (AFFF), metal finishing, semiconductors, paper and food packaging, coating additives, cleaning products, and pesticides.

TestAmerica offers the nation's largest LCMSMS capacity dedicated to PFAS testing, with approximately 30 PFAS related compounds at detection limits well below state and federal screening levels. Our PFAS offering leverages our experience in LCMSMS technology to provide a quality and cost effective solution to your analytical testing needs.

TestAmerica supports methods 537, ISO25101, 537M and PFAS by QSM 5.1 Table B15, with all the necessary validation data to support the precision and accuracy of our methodology. In addition, TestAmerica has successfully modified Method 537 for use on more complex matrices, such as groundwater, soil, tissue, and sediment, and has incorporated replacement chemicals such as GenX, ADONA and F-53B into this analysis.

Total Oxidizable Precursor (TOP) Assay

Polyfluorinated compounds are often referred to as "precursors" as they biotransform to perfluorinated compounds such as PFOA or PFOS. TestAmerica implemented the TOP Assay as a solution to this complex problem. The TOP assay rapidly converts these precursors into perfluoroalkyl acids, replicating what microorganisms in the environment may achieve over a number of years. This allows us to quantify the sum of PFAS precursors that could be converted to these dead-end products in the environment.

Replacement Chemicals "GenX, ADONA, F-53B"

Since 2000, there has been an ongoing push to replace long chain PFAS with shorter-chain chemicals thought to be less persistent and bioaccumulative.
Many alternative chemicals are in use below the regulatory radar, and it is unclear whether they are safe for humans or the environment. GenX, ADONA and F-53B represent replacement chemicals made by some of the legacy manufacturers of PFOA and PFOS.

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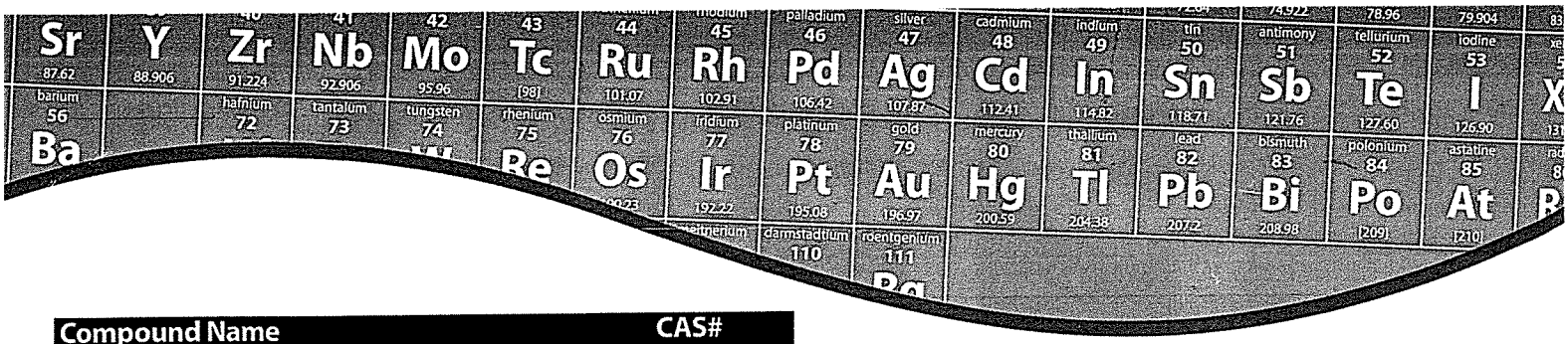

Compound Name	CAS#
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5
Perfluoro-1-hexanesulfonic acid (PFHxS)	355-46-4
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9
Perfluoro-n-octanoic acid (PFOA)	335-67-1
Perfluoro-1-octanesulfonic acid (PFOS)	1763-23-1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1
Perfluoro-n-butanoic acid (PFBA)	375-22-4
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3
Perfluoro-n-decanoic acid (PFDA)	335-76-2
Perfluoro-n-undecanoic acid (PFUnA)	2058-94-8
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1
Perfluoro-n-tridecanoic acid (PFTriA)	72629-94-8
Perfluoro-n-tetradecanoic acid (PFTeA)	376-06-7
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3
Perfluorinated sulfonamide (FOSA)	754-91-6
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexane sulfonate (4:2 FTS)	757124-72-4
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4
Perfluorononanesulfonic acid (PFNS)	68259-12-1

PFAS Replacement Compounds	CAS#
HFPO-DA "GenX"	13252-13-6
ADONA	958445-44-8
F-53B, Total	73606-19-6/ 83329-89-9

AskTheExpert

Have a Question About PFAS?

Karla Buechler

Corporate Technical Director, TestAmerica

Ms. Buechler has more than 30 years of hands-on experience with chromatography and would be happy to discuss PFAS methodologies. You may contact Ms. Buechler directly through the TestAmerica website at: http://www.testamericainc.com/services-we-offer/ask-the-expert/karla-buechler/

Questions about Data Comparability when using Method 537 Modified

There are a multitude of parameters and best practices to confirm with your laboratory when 537M is being applied. Are you asking your lab some of these key questions?

1. Is isotope dilution, including an isotopically labeled analog of each target analyte (where commercially available), and recovery correction employed?
2. Are secondary ion transitions and their ratios being used to improve method selectivity and reduce the potential for false positives?
3. Are all available branched and linear quantitation standards being used to improve the accuracy and reproducibility of analytical results?
4. Are appropriate cleanups being used for all matrices?
5. Are solid samples being sufficiently homogenized prior to a rigorous sample extraction method?
6. Are whole bottle sample extractions performed along with a methanol rinse of the container?
7. Is a chromatography gradient which sufficiently separates branched and linear isomers employed?
8. How many years of LCMS experience do the analysts have and do they have isotope dilution experience?
9. What redundancy and control measures do you have in place to manage contamination events?

To learn more about these key parameters and more: https://www.testamericainc.com/services-we-offer/ask-the-expert/karla-buechler/

To request a quote, please contact Client Services at info@testamericainc.com or 916-374-5600.

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