

# United States PFAS Analytical Instrumentation Market

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June 2022

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United States PFAS Analytical Instrumentation Market

# Scope of Research

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This study aims to provide a detailed analysis on the U.S. PFAS Analytical Instrumentation Market along with qualitative trends for the year 2021.

The market numbers included in this report represent revenues generated by companies operating in the PFAS analytical instrumentation market in the United States. The base year for the study is 2021 and the forecast period is from 2021 until 2028.

This study captures the following information on the United States PFAS Analytical Instrumentation Market:

- Market Size, Growth Rate, Revenue Forecasts (2021-2028)
- Growth Drivers & Restraints
- Market Data
- Market Share Analysis
  - \* By Technology
  - \* By Market Participants
  - \* By End Users
  - \* By Distribution
- Market Trends
- Quotes by Key Industry Participants

# Methodology

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## Interviews with key market participants

The methodology adopted while creating this research involved conducting interviews with various key market participants, enabling Verify Markets to identify various trends in the PFAS analytical instrumentation market in the United States. Furthermore, discussions with industry participants enabled us to provide a comprehensive country-level view of the overall market. Next, the information was validated through our internal databases, market experts, and secondary sources. The collected information was structured and collated into this report.



**Macro-economic factors and industry parameters:** Various country level parameters including the GDP, population, disposable incomes, product prices, and other trends were taken into consideration in the forecasting model. An in-depth analysis of these factors enabled Verify Markets to size and forecast the United States PFAS analytical instrumentation market.

# Definitions

## Perfluoroalkyl and polyfluoroalkyl substances (PFAS):

PFAS are a group of man-made fluorinated organic chemicals. They are identified by signature elemental bonds of fluorine and carbon, which are extremely strong, and makes it difficult for these chemicals to disintegrate in the environment. Certain PFAS are sometimes referred to as “forever chemicals” because they bioaccumulate and are long lasting in the environment. There are thousands of PFAS chemicals.

Since their introduction in the 1940s, the chemicals have been used in a variety of industries and consumer goods, such as carpeting, paper packaging, aqueous film-forming foams (AFFF), nonstick and weather-resistant coatings, rubber and plastics for their properties of enhancing products’ abilities to resist oil, water, flame, and chemical corrosion.

These chemicals are often found in soil and water near sites where they are manufactured, used or discarded, and can travel long distances—seeping into groundwater and even carried through the air, making them especially difficult to contain.

As such, even though perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are no longer manufactured in the United States, most Americans have been exposed to these chemicals.

While the science is still developing regarding the extent of possible effects on human health, initial research has shown that PFOA and PFOS are capable of causing certain types of cancer, liver and kidney issues, immunological problems, and reproductive and developmental harm.



Notably, the Agency for Toxic Substances and Disease Registry’s 2018 toxicological profile of PFAS also indicates that high levels of these chemicals in the blood may decrease how well the body responds to vaccines. Given the breadth of the chemicals’ negative impacts, state legislatures and the federal government are taking action to mitigate the harm to public health and the environment caused by the production and use of these chemicals.

Since the 2000s, some states in the United States have restricted the use of PFAS in certain consumer products for their toxicity to human beings, wildlife, and pollution to drinking water and the natural environment. To minimize environmental and human exposure to PFAS, in addition to the states of Washington, Maine, and New York, the states of Connecticut, Minnesota, Michigan, and Massachusetts have published bills to ban PFAS in food packaging.

On June 15, 2022, EPA issued final health advisories (HAs) for these two per- and polyfluoroalkyl substances (PFAS): 1) hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt (referred to as “GenX chemicals”); and 2) perfluorobutane sulfonic acid and its potassium salt (PFBS).

In chemical and product manufacturing, GenX chemicals are considered a replacement for perfluorooctanoic acid (PFOA), and PFBS is considered a replacement for perfluorooctane sulfonic acid (PFOS). At the same time, EPA issued interim updated drinking water health advisories for PFOA and PFOS that replace those EPA issued in 2016. These updated health advisories levels, which are based on new science, will remain in place until EPA establishes a National Primary Drinking Water Regulation.





## United States PFAS Analytical Instrumentation Market

# Definitions

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For the PFAS analytical instrumentation market, we have segmented the market by two measuring techniques: Liquid Chromatography - Mass Spectrometry (LC-MS/MS) and Combustion Ion Chromatography (CIC). At the moment, EPA has only approved PFAS measurement by LC-MS/MS technique. PFAS analysis by CIC technique is at the drafting stage and EPA is currently reviewing the results of the multi-laboratory validation study to finalize the method and add formal performance criteria.

### Liquid chromatography-Mass Spectrometry (LC-MS/MS):

The determination of individual, target PFAS is performed using isotope dilution and liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS). These analytical protocols represent industry accepted best practices and are typically based on United States Environmental Protection Agency (US EPA) methods.

The US EPA has standardized two methods for the analysis of PFAS in drinking water: EPA Method 537.1 and 533, encompassing a total of 29 PFAS. These methods were used as reference for creating a vetted LC-MS/MS Method Package for Analyzing PFAS in Drinking Water. This method package includes ready-to-use analytical conditions for EPA Methods 533, 537.1, examples of analytical procedures for the methods, and various other information, such as precautions for sample preparation and analysis. All three methods report detection limits in the low part per trillion (ppt) range.

US EPA Method 8327 is a dilute-and-shoot liquid chromatography/tandem mass spectrometry (LC-MS/MS) method for the rapid analysis of 24 PFAS in non-potable waters, including surface water, groundwater, and wastewater. It follows the same protocols as ASTM method D7979. Multiple Reaction Monitoring (MRM) is used to enhance selectivity, and quantification is by external calibration.

### Combustion Ion Chromatography (CIC) - Draft Method 1621

EPA's Office of Water has published Draft Method 1621, "Screening Method for the Determination of Adsorbable Organic Fluorine (AOF) in Aqueous Matrices by Combustion Ion Chromatography (CIC)," a single-laboratory validated method to screen for organofluorines in wastewater. This method detects organofluorines (molecules with a carbon-fluorine bond), which are rarely naturally occurring. The most common sources of organofluorines are PFAS and non-PFAS fluorinated compounds such as pesticides and pharmaceuticals.

The method tells the user that the organofluorines are present but does not identify which organofluorines are present. The strength of the method is that it can broadly screen for thousands of known PFAS compounds at the part per billion level in aqueous (water) samples.

EPA's new Draft Method 1621 has completed single-laboratory validation. Multi-laboratory validation will take place in summer of 2022. The Office of Water will use the results of the multi-laboratory validation study to finalize the method and add formal performance criteria. In the meantime, the Office of Water encourages interested parties to review and use the method, with the understanding that it is subject to revision and is not nationally required for Clean Water Act (CWA) compliance monitoring until it has been promulgated through rulemaking.

### Draft Method 1633 for 40 PFAS Compounds:

EPA's Office of Water, in partnership with the Department of Defense's (DoD) Strategic Environmental Research and Development Program, has published draft Method 1633, a single-laboratory validated method to test for 40 PFAS compounds in wastewater, surface water, groundwater, soil, bio solids, sediment, landfill leachate, and fish tissue. This draft method can be used in various applications, including National Pollutant Discharge Elimination System (NPDES) permits. The method will support NPDES implementation by providing a consistent PFAS method that has been tested in a wide variety of wastewaters and contains all the required quality control procedures for the CWA. While the method is not nationally required for CWA compliance monitoring until EPA has promulgated it through rulemaking, it is recommended now for use in individual permits.

Historically, EPA published draft methods on this Clean Water Act Methods website after completing the single-laboratory validation report. However, due to many public and stakeholder requests, this method was made available while DoD and EPA prepared the single-laboratory validation study report. The report is now available.

Multiple EPA programs have reviewed this draft method. DoD has begun a multi-laboratory validation study of the procedure, which is expected to be completed in 2022. DoD's multi-laboratory validation is proceeding in collaboration with the Office of Water, the Office of Land and Emergency Management, and the Office of Research and Development.

The Office of Water will use the results of the multi-laboratory validation study to finalize the method and add formal performance criteria. The method validation process may eliminate some of the parameters listed in this draft method. Wastewater and soil samples are prepared in accordance with ASTM 7979 and ASTM 7968, respectively.

# Segmentation by end users

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**Commercial testing laboratories**



**Wastewater treatment plants**



**Drinking water treatment plants**



**Regulatory bodies and federal agencies**



**Academic R&D**



**Industrial facilities**

Industrial facilities include chemical plants, hazardous waste, machinery, food, chemical wholesalers, electronic products, petroleum, and others

# About Verify Markets





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# About us

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## Expert Advice and Strategy Consulting

Verify Markets is a Research Firm specializing in Industrial, Environmental, Energy and Water markets. Our Research & Consulting practice provides global industry analysis, custom engagements, end-user analysis, strategy consulting, strategic market intelligence, and forecasts that are designed to facilitate strategic decision-making. Our team of consultants, industry experts and analysts continually monitor and evaluate information to create insights for your business needs. We are comprised of a group of analysts that have been tracking their respective markets for a number of years.

Our goal is to help you reach yours.

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# Methodology

The methodology when formulating market trend projection is outlined below.

Historical trends were determined through secondary research and Verify Markets in-house database.

## Secondary Research

Secondary research was conducted. A list of key industry participants was put together.



## Primary Research

Telephonic interviews were conducted. Most of the leading participants across North America were contacted.

## Bottom-up

Bottom-up methodology was used to calculate the market size.



## Drivers & Restraints

Market drivers and restraints were built into the forecasting model to estimate the revenue growth and market size figures.

Most of the primary interview data was captured through telephonic interviews. Pictures, company contacts, preliminary data was captured through secondary research. Images are derived from company websites and other web sources.



## Disclaimer

Despite Verify Markets' best efforts, certain challenges were encountered, and certain assumptions had to be made. The extremely competitive nature of the United States PFAS Analytical Instrumentation market often results in an increased reluctance on the part of several competitors to discuss their market position, future plans, or market trends. Verify Markets used its skills and experience to extract the relevant data in order to complete the analysis.

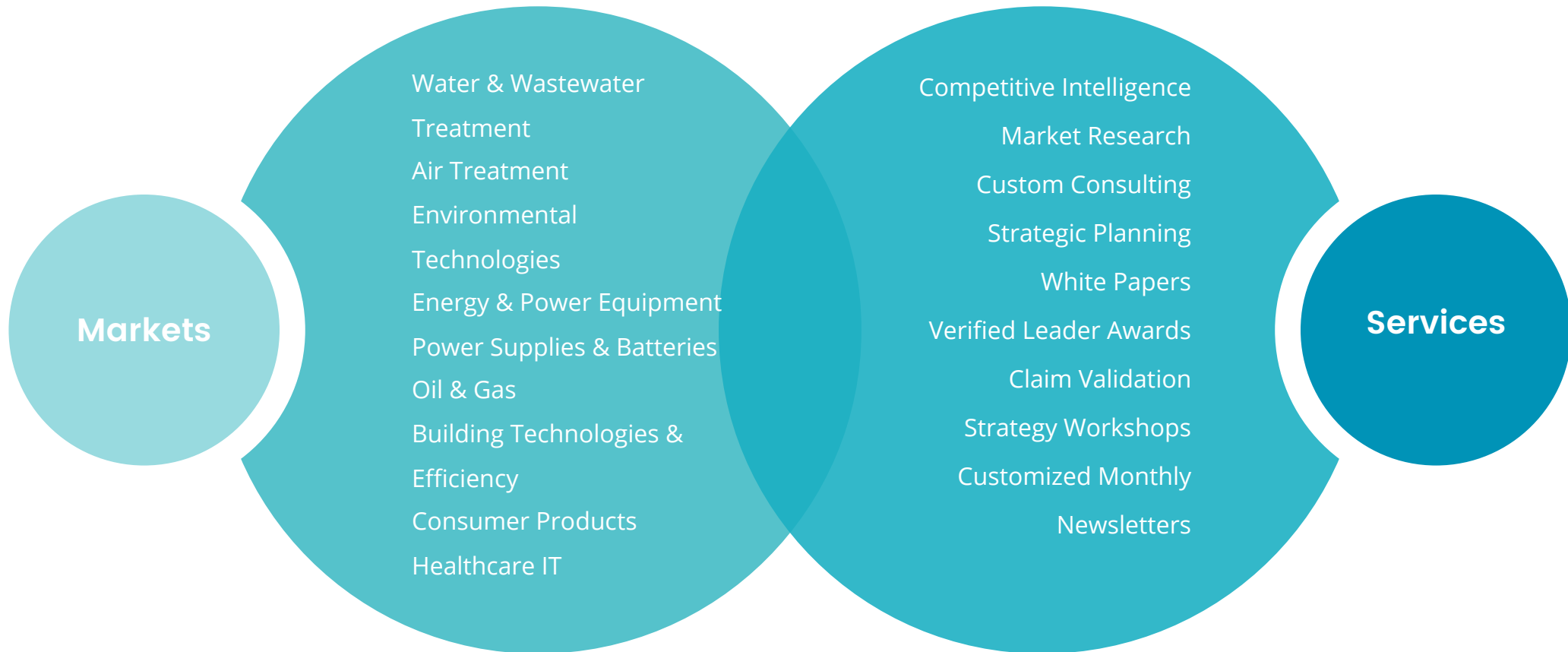
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Verify Markets

# Capabilities

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Verify Markets

# Global Presence





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# Have A Question?

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Contact us and set up a time to speak with our analysts.





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# Contact us: We're social

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