

## **Process Analytical Instrumentation - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029**

Market Report | 2024-02-17 | 180 pages | Mordor Intelligence

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### **Report description:**

The Process Analytical Instrumentation Market size is estimated at USD 5.67 billion in 2024, and is expected to reach USD 8.19 billion by 2029, growing at a CAGR of 7.61% during the forecast period (2024-2029).

#### Key Highlights

- The most vastly used analysis for process engineering is process gas chromatography. It is the most utilized method for gas analysis since it permits multiple components to be analyzed alongside. Gas chromatographs have plenty of downtime and need a lot of supervision. The gas chromatograph consists of a process modular oven choice that another module may fix and replace. Furthermore, this may decrease equipment downtime & improve process productivity. Customers find process gas chromatographs difficult, although they are the most broadly used analyzer for hydrocarbon & other complicated gas analyses.
- The growth of automation in the manufacturing sector has driven the development of the market studied. With the worldwide impact of Industry 4.0, the manufacturing industry is going toward automation. Process analytical instruments are a good fit with this evolving trend. For instance, integrating digital communications technologies & standards like foundation fieldbus & electronic device description language has constructed the information collected by the instruments readily accessible to enhance the process and deliver persistent accuracy.
- In current years, the increase in the market studied has been driven by factors like the growing use of the equipment in process engineering, high investments in pharmaceuticals worldwide, strict regulations on drug safety, growing emphasis on the quality of food products, development of crude and shale gas production, and technological advancements in mass spectrometers. Spectrometers are discovering applications in environmental, petrochemical, food safety, metallurgical, geochemical, & clinical toxicology research. These products are primarily used in markets like China, India, and Latin America to help comply with growing stringent international environmental & consumer safety regulations.
- Furthermore, the future of the market is anticipated to have a greater influence of factors such as a high investments in

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pharmaceuticals across the globe, stringent safety regulations medicines, the expansion of crude oil and shale gas production, increasing attention to food quality and technological advances in mass spectrometers.

-However, analytical instrumentation's software licensing should be considered among the major challenging factor to the studied market, as different companies have different licenses. For instance, some allow the use of software on other computers for data processing; while others require the purchase of a second license for this purpose. Hence, such issues may negatively impact the growth of the market studied market during the forecast period.

-During COVID-19 global economy was under stress. After many years of strong growth, global trade slowed, mainly due to the accumulation of problems in Europe and the United States. Similar issues might arise in emerging economies in the future.

However, these short-term dynamics should clarify the longer-term structural changes in the global trading system which is anticipated to work in favor of the studied market.

## Process Analytical Technology Market Trends

### Pharmaceutical and Biotechnology is Observing a Significant Growth

- This segment contains firms engaged in manufacturing medicinal & pharmaceutical products. It also contains companies delivering healthcare devices utilized for treatment or diagnosis.

- The biopharmaceutical manufacturing industry relies on analytical testing to help improve productivity, optimize and monitor processes, characterize biologics and biosimilars, and provide real-time product quality control. All these are essential in creating a more streamlined process within biomanufacturing, resulting in lower costs, more consistent product quality, and more efficient manufacturing across the board.

- The pharmaceutical industry has always searched for ways to improve product quality. Over time, as instrument accuracy and precision improved, the industry began focusing more on efficiency. Hence, the growing investment in pharmaceutical research and development will create a favorable outlook for the growth of the studied market. For instance, according to EvaluatePharma, global spending on pharmaceutical research and development is anticipated to reach USD 254 billion during the forecast period.

- Furthermore, crucial analytical tools like chromatography and spectroscopy are gaining new ground. Since chromatography (GC) machines can analyze tiny and light compounds, GC is used in post-production. In other words, GC is a standard process during quality control. However, identifying volatile impurities is the primary use of GC within the pharmaceutical industry.

- There are several optical spectroscopy techniques, and each excels at various manufacturing stages. While some methods enjoy wide acceptance, such as near-infrared (NIR) and Fourier transform infrared (FTIR) absorption spectroscopy, broader adoption of newer techniques, such as terahertz Raman spectroscopy, can also benefit pharmaceutical production. More recently, spectroscopy has also begun to focus on the structural composition and distribution of pharmaceutical products. It has additional applications in quality control, which help validate that the manufacturing process and end products meet strict compliance and regulatory controls. Such trends will favor the growth of the studied market in future.

### North America to Hold a Significant Market Share

- Process analytical technology (PAT) and instrument vendors in North America have continually advanced their technology's usability, accuracy, reliability, and efficacy in the past few years. Companies in this sector introduced technological developments and other innovations to better support lab and QA/QC operations.

- The traditional ways of production in the industries, such as oil and gas, metal and mining, and pharmaceuticals, involved processes that included manufacturing of the finished products and laboratory analysis for verifying the quality of the final finished products. However, these traditional methods have some drawbacks as recurring manufacturing difficulties, constant

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process optimization, and the probability of failed batches. Thus, to overcome these glitches, the new technology known as PAT was introduced by FDA (Food and Drug Administration) to change the mode of operation.

- The US FDA has outlined a regulatory framework for PAT implementation. With this framework, the FDA tries to motivate the pharmaceutical industry to enhance the production process. For instance, in January 2021, the new portable multi-gas monitor was launched by ENVEA, intending to meet the demands of regulatory and routine stack emission monitoring while saving users' time throughout their on-site day. The MIR 9000P complies with global regulations and standards, including US EPA's. For eight parameters, it ensures great accuracy and wide measuring ranges (NO<sub>x</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, O<sub>2</sub>, and residual H<sub>2</sub>O). The analyzer uses a built-in paramagnetic sensor to measure O<sub>2</sub> while using the non-dispersive infrared technique with gas filter correlation (NDIR-GFC) (SRM).

- Owing to the existence of the United States and Canada, which are the countries that spend a substantial amount on research and development and hold a prominent share in life sciences, oil and gas, materials sciences, pharma, and biopharma industries, the region holds a major share of the process analytical instrumentation market. According to Pharmaceutical Commerce, the pharmaceutical market is on the rise in the United States. By 2023, it is expected that Americans will spend USD 635 to USD 655 billion on pharmaceuticals; compared to 2019, this indicated a solid 29.6-33.7% rise in spending in 2020.

- The increase in the approval of new drugs would significantly drive the rise of pharmaceutical solutions, which would enhance the requirement of process analytical instruments to analyze the chemical composition or physical properties of the solution during drug making. For instance, the FDA's Center for Drug Evaluation and Research (CDER) approved 37 new drugs and biological products in 2022. Furthermore, 20 of the 37 novel drugs approved in 2022 (54%) were identified by CDER as first-in-class.

## Process Analytical Technology Industry Overview

The process analytical instrumentation market is fragmented, with several major companies. The companies continuously invest in strategic partnerships and product developments to gain market share. Some major players in the market are ABB Ltd, Siemens AG, Bruker Corporation, Emerson Electric Co., and Endress & Hauser. Some of the recent developments in the market are:

- April 2023 - India's Science and Technology Minister launched an initiative under which the ministry will provide financial support for the maintenance and degradation of analytical instrumentation facilities (AIFs) created under the ministry's support. The Support for Up-gradation Preventive Repair and Maintenance of Equipment (SUPREME) program by the government extends financial support for maintenance, repair, degradation, or acquiring additional attachments to increase the functional capabilities of existing analytical instrumentation facilities.

- June 2022 - Endress + Hauser AG launched the LiquilineSystem CA80TN, which provides a precise and regular-compliant online measurement of total nitrogen. The LiquilineSystem CA80TN colorimetric analyzer could deliver real-time nitrogen values, helping wastewater treatment plant managers control their processes. The titanium reactor of the CA80TN analyzer and its hard-coated optical filters could offer superior long-term performance.

### Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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