

Particle Size Analysis Market Report by Technology (Laser Diffraction, Dynamic Light Scattering (DLS), Image Analysis, Nanoparticle Tracking Analysis (NTA), and Others), Application (Medicine and Healthcare Industry, Mining and Minerals Industry, Petrochemical Industry, Food and Beverages Industry, and Others), and Region 2024-2032

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Abstracts

The global particle size analysis market size reached US\$ 397.8 Million in 2023. Looking forward, IMARC Group expects the market to reach US\$ 595.8 Million by 2032, exhibiting a growth rate (CAGR) of 4.5% during 2024-2032. An enhanced focus on research and development (R&D) activities focusing on eco-friendly and bio-based analytical techniques, considerable growth in outsourcing services, industrial expansion on a global level, and continual technological advancements in analytical methods represent some of the factors that are propelling the market.

Particle size analysis is a critical technique employed to assess and evaluate the dimensions of particles in various materials, from powders and granules to aerosols and suspensions. The method serves as a vital tool in diverse industries, providing essential data to understand the behavior, performance, and quality of raw materials and finished products. These technologies deploy specialized instrumentation that effectively segregates particles, capturing the distribution of dimensions within a given sample. The core working mechanism entails the dispersion of particles in a fluid medium, followed by the measurement of the scattered light or pattern of sedimentation, thus providing a detailed characterization of the particle ensemble. The resulting data offers actionable insights, assisting businesses in making informed decisions related to product development, quality control, and regulatory compliance.

The global market is primarily driven by an enhanced focus on research and development activities focusing on eco-friendly and bio-based analytical techniques. In line with this, the stringent regulatory landscape across several countries is compelling industries to adhere to high standards of quality control, which inherently requires precise particle size analysis. Moreover, with businesses recognizing the necessity for more accurate and precise measurements, it is generating higher demand for advanced particle size analysis methods. The market is further influenced by numerous innovations in software capabilities, which enrich data interpretation and consequently guide business decisions. Apart from this, the upward trajectory of global industrial expansion necessitates stringent quality control measures, thereby adding impetus to the market. Some of the other factors contributing to the market's growth include the emergence of new markets, the rising importance of customer service and post-sales support as a differentiator, and the integration of advanced computing capabilities into existing technologies.

Particle Size Analysis Market Trends/Drivers:
Considerable growth in outsourcing services

The contemporary business landscape facilitates fierce competition and the augmenting need for specialization. As a result, companies are focusing more on their core competencies and less on ancillary functions, leading to an expansion in the outsourcing of specialized services, including particle size analysis. By leveraging the expertise of specialized service providers, businesses can ensure precise and reliable results without the burden of maintaining an in-house analytical team. This trend reduces costs, enhances focus, and ultimately leads to more efficient operations. It also creates a demand cycle where service providers need to continually update their methods and technologies, leading to consistent innovation in particle size analysis techniques. This rise in outsourcing services for particle size analysis can be seen as a double-edged sword, enhancing market growth while promoting technological advancements in analytical methods.

Rising consumer preferences for quality

Consumers are becoming increasingly discerning about the products they use due to the prevalence of abundant choices and information. Quality is no longer a luxury but an expectation. Whether it's the medicine they take, the food they eat, or the materials they use, the demand for high-quality products has never been higher. This emphasis on quality permeates every aspect of production, including quality control and assurance,

wherein particle size analysis plays an indispensable role. For instance, in the pharmaceutical sector, even a minute change in particle size can alter a drug's release rate, thus affecting its efficacy. Similarly, in the construction industry, the particle size of materials like cement or sand can dramatically influence the strength and durability of structures. Given this scenario, companies are investing in advanced particle size analysis methods to meet consumer expectations and regulatory requirements, thereby driving the market positively.

Continual technological advancements in analytical methods

As industries become more complex and the materials they use become more specialized, the requirements for analytical precision have similarly escalated. For instance, the pharmaceutical sector continually pushes for more accurate particle sizing to improve drug delivery systems. More precise particle size analysis allows for better control of drug release rates, absorption, and efficacy, which in turn ensures patient safety and treatment effectiveness. The advanced technologies are not merely confined to pharmaceuticals; they are prevalent across various sectors, such as materials science, where understanding particle size is crucial for manipulating material properties. The integration of machine learning (ML) and data analytics into particle size analysis methods is another innovation that is offering quicker and more accurate data interpretation. Consequently, these technological advancements provide the critical infrastructure enabling industries to meet rigorous quality control standards.

Particle Size Analysis Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global particle size analysis market report, along with forecasts at the global and regional levels for 2024-2032. Our report has categorized the market based on technology and application.

Breakup by Technology:

- Laser Diffraction
- Dynamic Light Scattering (DLS)
- Image Analysis
- Nanoparticle Tracking Analysis (NTA)
- Others

Laser diffraction represents the largest market segment

The report has provided a detailed breakup and analysis of the market based on the technology. This includes laser diffraction, dynamic light scattering (DLS), image analysis, nanoparticle tracking analysis (NTA), and others. According to the report, laser diffraction represented the largest segment.

The laser diffraction segment is majorly driven by its high degree of accuracy, reproducibility, and ease of operation. This technology is widely used in quality control applications across various industries such as pharmaceuticals, chemicals, and materials science. Its versatility in analyzing a broad range of particle sizes—from nanometers to millimeters—gives it a significant edge. The rapid increase in pharmaceutical research and development activities has particularly propelled the adoption of laser diffraction for better analysis. Regulatory standards that emphasize particle size distribution in product quality also contribute to this segment's growth.

On the other hand, the dynamic light scattering (DLS), image analysis, nanoparticle tracking analysis (NTA), and others combined make up the minor segments. DLS is primarily used for characterizing smaller particles and colloids, and its growth is often linked to research in nanotechnology. Image analysis finds applications in materials science for morphology studies. NTA has a niche market mainly focused on biopharmaceuticals for protein aggregation and viral load studies. Other techniques fill in gaps where specialized analyses are needed, such as sedimentation or sieving methods.

Breakup by Application:

- Medicine and Healthcare Industry
- Mining and Minerals Industry
- Petrochemical Industry
- Food and Beverages Industry
- Others

Medicine and healthcare industry accounts for the majority of the market share

The report has provided a detailed breakup and analysis of the market based on the application. This includes medicine and healthcare industry, mining and minerals industry, petrochemical industry, food and beverages industry, and others. According to the report, medicine and healthcare industry represented the largest segment.

In terms of end-use sectors, the medicine and healthcare industry is a major segment

due to the critical role that particle size plays in drug formulation, delivery, and manufacturing processes. Regulatory mandates, such as FDA and EU guidelines, necessitate precise particle size analysis to ensure product efficacy and safety. Technological advancements in healthcare research have also led to higher requirements for more sophisticated particle size analysis techniques. As the industry continues to evolve with the introduction of more complex biological drugs and treatments, the demand for particle size analysis is expected to grow proportionally.

On the other hand, the mining and minerals industry, petrochemical industry, food and beverages industry, and others constitute the minor segments in end-use sectors. In mining, particle size impacts the efficiency of mineral extraction processes. The petrochemical sector uses particle size analysis for quality control and process optimization. In the food and beverage industry, it is vital for texture and taste optimization. Other industries like cosmetics and agriculture also utilize particle size analysis for product development and quality control.

Breakup by Region:

North America

Europe

Asia Pacific

Latin America

Middle East and Africa

North America exhibits a clear dominance, accounting for the largest particle size analysis market share

The market research report has also provided a comprehensive analysis of all the major regional markets, which include North America; Europe; Asia Pacific; Latin America; and the Middle East and Africa. According to the report, North America accounted for the largest market share.

North America leads the global market due to a robust industrial framework, extensive research and development activities, and stringent regulatory guidelines. The presence of key players headquartered in the region adds to the market growth. Innovations in particle size analysis technologies are primarily emanating from North America, which catalyzes the regional market's growth.

Regulatory frameworks, particularly in pharmaceuticals and healthcare, demand

stringent quality control, which in turn drives the need for advanced particle size analysis methods. Furthermore, the North American food and beverages industry, being one of the largest globally, utilizes particle size analysis for quality assurance and new product development. The mining sector in the region, rich in minerals and natural resources, contributes to the demand as it relies on particle size analysis for optimizing extraction processes. As for petrochemicals, the expanding shale oil and gas market also requires precise particle size analysis. Academic research institutions and government bodies provide grants and funding that lead to further research and technology advancements.

Competitive Landscape:

The key players are consistently investing in research and development to introduce innovative technologies that offer higher precision and ease of use. They are also expanding their product portfolios to cater to a variety of industries, including pharmaceuticals, food and beverages, and petrochemicals. Major companies are actively acquiring smaller firms and technologies to consolidate their market presence. Strategic partnerships with research institutions are being formed to gain access to cutting-edge research, thereby facilitating the development of more advanced analytical tools. Regulatory compliance is another area where significant efforts are being directed to ensure that their devices meet all requisite quality and safety norms. Furthermore, these key players are offering training programs for end-users to maximize the efficiency and application of their products.

The report has provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the key players in the market include:

Malvern Instruments Ltd.

Horiba Ltd.

Beckman Coulter Inc.

Microtrac Inc.

Micromeritics Instruments

Recent Developments:

In June 2023, Malvern Instruments Ltd. announced the launch of its NanoSight Pro nanoparticle tracking analysis (NTA) system. Powered by machine learning coupled with designed-in smart features, NanoSight Pro simplifies nanomaterials characterization, enabling every user to quickly generate reproducible, robust, and high-quality data.

In August 2023, Horiba Ltd. announced that its Yumizen H500 benchtop hematology analyzer has won the Best New Clinical Instrumentation Award for 2022 at the Scientists' Choice Awards®. HORIBA's Yumizen H500 is a compact analyzer that is designed for small laboratories and is ideal for use in a variety of clinical laboratory environments and point-of-care (POC) settings or for anyone looking to upgrade from a 3-part to a 5-part differential technology solution.

In July 2023, Beckman Coulter Inc. revealed for the first time in North America the Dxl 9000 Access Immunoassay Analyzer, addressing clinical laboratory demands for speed, reliability, reproducibility, quality, and menu expansion. The Dxl 9000 Analyzer has shown capability to develop increasingly sensitive and clinically relevant assays enabling the platform to keep pace with tomorrow's testing requirements as healthcare providers and pharmaceutical companies take aim at evermore challenging diseases.

Key Questions Answered in This Report:

How has the global particle size analysis market performed so far, and how will it perform in the coming years?

What are the drivers, restraints, and opportunities in the global particle size analysis market?

What is the impact of each driver, restraint, and opportunity on the global particle size analysis market?

What are the key regional markets?

Which countries represent the most attractive particle size analysis market?

What is the breakup of the market based on the technology?

Which is the most attractive technology in the particle size analysis market?

What is the breakup of the market based on the application?

Which is the most attractive application in the particle size analysis market?

What is the competitive structure of the global particle size analysis market?

Who are the key players/companies in the global particle size analysis market?

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