

# **Microplastic Detection Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Synthetic Microplastics, Natural Microplastics), By Technology (Raman Spectroscopy, Fourier-Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM), Pyrolysis-Gas Chromatography-Mass Spectrometry (Py-GC-MS), Others), By Application (Environmental Monitoring, Food & Beverage Testing, Marine & Aquatic Monitoring, Healthcare & Biomedical Applications, Others), By End User Industry(Research Laboratories, Regulatory Bodies, Industrial Facilities, Others), By Region & Competition, 2021-2031F**

<https://marketpublishers.com/r/M717991F3C4EEN.html>

Date: January 2026

Pages: 181

Price: US\$ 4,500.00 (Single User License)

ID: M717991F3C4EEN

## **Abstracts**

The Global Microplastic Detection Market is projected to expand from USD 4.98 Billion in 2025 to USD 7.31 Billion by 2031, reflecting a CAGR of 6.61%. This sector encompasses specialized analytical instruments and testing methodologies, including spectroscopy and microscopy, designed to identify, characterize, and quantify plastic particles smaller than five millimeters in biological and environmental samples. The market is primarily driven by strict government regulations necessitating improved water quality standards and the growing industrial need to ensure product purity within food and beverage supply chains. These regulatory frameworks act as fundamental drivers, distinct from temporary consumer trends, requiring precise contamination monitoring to reduce public health risks and ecological liability.

Despite this positive growth trajectory, the industry faces a major challenge due to the lack of universally standardized testing protocols, which leads to data inconsistency and prevents the comparability of results across different jurisdictions. This fragmentation hampers compliance efforts and slows the widespread commercial adoption of advanced detection systems. Highlighting the magnitude of material requiring strict quality control, Plastics Recyclers Europe reported that the total installed plastics recycling capacity in the region reached 13.5 million tonnes in 2024. This immense volume underscores the critical need for reliable detection technologies to manage contamination and maintain the integrity of circular economy streams.

### **Market Driver**

The enforcement of rigorous environmental regulatory frameworks is rapidly broadening the microplastic detection market, as governments pass legislation requiring exact quantification of contaminants in water systems. This regulatory pressure compels industrial entities and public water agencies to integrate advanced analytical testing into their routine compliance schedules. For instance, California has led this shift by mandating the monitoring of drinking water sources, generating a direct revenue stream for analytical laboratories. Illustrating the economic implications of these requirements, King & Spalding noted in a March 2024 article, 'California Becomes First State to Adopt Statewide Testing Requirement for Microplastics in Drinking Water,' that the cost for water providers to conduct the necessary microplastics analysis is estimated to range between \$1,000 and \$2,000 per sample.

Simultaneously, escalating concerns regarding food safety and human health are driving the adoption of high-resolution technologies capable of detecting nanoplastics, which were previously undetectable. Scientific discoveries concerning the abundance of particles in consumer goods have spurred demand for sensitive instruments. For example, a January 2024 study published in the 'Proceedings of the National Academy of Sciences' by Columbia University researchers utilizing novel imaging technology revealed that a liter of bottled water contained an average of 240,000 plastic fragments, far exceeding prior estimates. To address the market-wide need for consistent data amidst these findings, the European Commission established a harmonized methodology in May 2024 through 'Commission Delegated Decision (EU) 2024/1441' for measuring microplastics in water intended for human consumption.

### **Market Challenge**

The lack of universally standardized testing protocols poses a critical barrier to the Global Microplastic Detection Market by compromising data reliability and stalling large-scale commercial investment. Without harmonized definitions or detection limits, analytical laboratories often use varying methodologies, ranging from visual microscopy to complex spectroscopy, resulting in inconsistent datasets that are difficult to compare across regions or supply chains. This fragmentation creates significant uncertainty for equipment manufacturers and end-users, as stakeholders struggle to validate whether a specific instrument meets conflicting compliance requirements in different jurisdictions.

Consequently, this absence of uniformity restricts the ability of industries to confidently invest in detection infrastructure, as results obtained in one market may be considered invalid in another. Highlighting the confusion caused by divergent analytical capabilities, the International Bottled Water Association faced intense scrutiny in 2024 regarding research detecting an average of 240,000 plastic particles per liter in bottled water, a figure the association argued was derived using non-standardized methods lacking scientific consensus. Such discrepancies demonstrate how the methodological void prevents the market from establishing the clear benchmarks and trust necessary for sustained growth.

## **Market Trends**

The technological evolution toward nanoplastic detection and quantification is fundamentally reshaping the market as laboratories strive to identify ultra-trace contaminants that escape traditional micro-scale analysis. This trend is marked by the development of ultra-sensitive instrumentation designed to characterize particles at the molecular level, addressing the increasing need to assess toxicity in biological systems. Innovators are combining advanced imaging and chromatography to push detection limits significantly lower than previously possible. Demonstrating this leap in sensitivity, Agilent Technologies announced in November 2025, in the 'Agilent and University of Melbourne Unveil Innovation Hub' release, that the company's newly integrated systems achieved world-class breakthroughs in parts per quadrillion (PPQ)-level quantitation of microplastics and PFAS.

Concurrently, the implementation of real-time in-situ water quality monitoring systems is emerging as a crucial trend, moving the industry away from exclusive reliance on time-consuming laboratory samples. This shift involves deploying autonomous, sensor-based platforms capable of continuously analyzing water streams to provide immediate data for environmental compliance and rapid decision-making. These field-deployable solutions use flow-through technologies to detect pollution events as they occur,

streamlining the monitoring workflow. Validating the efficacy of these new tools, Applied Ocean Sciences reported in a February 2025 article, 'A New Approach for Detecting Oceanic Microplastics in Real Time,' that their newly developed ultrasonic sensor demonstrated the capability to detect plastics smaller than 20 microns in near real-time.

## **Key Market Players**

Thermo Fisher Scientific Inc

Agilent Technologies, Inc

Bruker Corporation

PerkinElmer AES

JEOL Ltd.

Shimadzu Corporation.

Danaher Corporation.

ZEISS Group.

Renishaw plc.

Oxford Instruments plc.

## **Report Scope**

In this report, the Global Microplastic Detection Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Microplastic Detection Market, By Type

Synthetic Microplastics

Natural Microplastics

## Microplastic Detection Market, By Technology

Raman Spectroscopy

Fourier-Transform Infrared Spectroscopy (FTIR)

Scanning Electron Microscopy (SEM)

Pyrolysis-Gas Chromatography-Mass Spectrometry (Py-GC-MS)

Others

## Microplastic Detection Market, By Application

Environmental Monitoring

Food & Beverage Testing

Marine & Aquatic Monitoring

Healthcare & Biomedical Applications

Others

## Microplastic Detection Market, By End User Industry

Research Laboratories

Regulatory Bodies

Industrial Facilities

Others

## Microplastic Detection Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

## **Competitive Landscape**

Company Profiles: Detailed analysis of the major companies present in the Global Microplastic Detection Market.

## **Available Customizations:**

Global Microplastic Detection Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

## **Company Information**

Detailed analysis and profiling of additional market players (up to five).

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