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# MICROSCOPY MARKETS

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Trends, Industry Participants, Product Overviews and Market Drivers

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## 1. Overview

### 1.1 Statement of Report

The microscopy market is a complex, high-technology market spanning many different sectors. It is a challenging market due to the complexity of the instrumentation, as well as the intense technical support required to maintain the customer base. This report describes major microscope market segments and includes examinations of light, confocal, electron, ion and scanning probe microscopes. Cutting-edge applications for innovative microscope technology platforms such as semiconductor processing systems and automated imaging systems are explored. The market segment analysis presents professional microscopes used in industrial, clinical and academic laboratories, and the companies that produce them. Companies in the U.S. and worldwide are analyzed and discussed, with specific emphasis on those companies that are actively developing and marketing microscopy devices.

This report covers the following categories of microscopes:

- Light microscopes.
- Confocal microscopes.
- Scanning probe microscopes.
- Fourier transform infrared microscopes.
- Ultraviolet microscopes.
- Scanning acoustic microscopes.
- X-ray microscopes, Raman microscopes and microtomes.
- Electron microscopes and those using other charged particles.

### 1.2 Scope of This Report

This examination provides an overview of individual microscopy markets that are believed to possess the elements that will lead to sustained growth rates for the foreseeable future. The current status of each market is assessed, with projections for market size, discussions of the market strategies of leading companies in each market segment, and evaluations of the forces that underlie the high growth of each segment. An overview of microscopes and related supplies marketed by major companies is additionally provided for each market segment. The market size, growth rates and market components for instruments used for microscopy are also analyzed. Market figures on the current value of the microscopy market are taken from the most recently available data of the global medical products industry. Company-specific information, including sales figures, product pipeline status and R&D trends, is provided throughout the report.

This study provides the following information:

- Assesses the microscopy market drivers and bottlenecks from the perspective of the medical and scientific communities.
- Discusses the potential benefits of the microscopy market for various sectors of the medical and scientific communities.
- Establishes the current total market size and future growth of the microscopy market and analyzes the current size and growth of various segments.
- Provides current and forecasted market shares by company.
- Discusses profit/business opportunities by imaging segment.
- Provides strategic recommendations for near-term business opportunities.
- Assesses current commercial uses of the microscopy technology platforms.
- Reviews microscopy product business models.

This report concentrates on the microscopy market segment in important worldwide markets, such as the U.S., Japan and Europe. The market for microscopy is reviewed for the clinical and research hospital market, rather than the heavy industrial uses of microscopy imaging. The focus is on end-user markets, including hospitals, research facilities, freestanding clinics and equipment-leasing companies. The review defines the dollar volume of sales of

the market, both worldwide and in the U.S. and analyzes the factors that influence the size and growth of the market segments. Separately, the report provides a description of the instruments, reagents, and supplies marketed by major companies in the microscopy segment. The analysis discusses the market size, growth rates and market components for instruments, reagents, controls and consumables used in microscopy.

### 1.3 Objectives

The principal objectives of this study are to:

- Identify viable technology drivers through a comprehensive evaluation of various platform technologies for microscopes.
- Obtain a complete understanding of the use of microscopy—predictive, screening, prognostic, diagnostic and monitoring—from its basic principles to its applications.
- Discover feasible market opportunities by identifying high-growth applications in different imaging areas, with a focus on the largest and expanding markets in microscopy.
- Focus on global industry development of microscopy through an in-depth analysis of the major world markets for microscopic imaging, including growth forecasts.
- Establish the essentials of the microscopic imaging market, including definitions, processes and trends.

Activity and trends in the microscopy market are also discussed, including the number of institutional placements and factors that influence purchasing activity. Each company is discussed in depth, with sections on its history, product lines, business and marketing analysis and a subjective commentary on the company's position in its market.

Report facts at a glance:

- A comprehensive, up-to-date report describing and analyzing microscopy markets.
- Data-intensive research—an imperative for the serious player.
- Focused identification of key microscopy market segments.
- Reader-friendly tables, charts and text formats.
- Profiles of leading companies, covering key and niche players worldwide.
- Market data, tables, shares, analyses, trends and more.
- Research assisted by many key players worldwide.

### 1.4 Methodology

The author of this report is a Ph.D. in biochemistry from the University of Minnesota, with many decades of experience in science writing and as a medical industry analyst. He has been a senior director of several large regional and national healthcare laboratories. The senior editor is a Ph.D. in biochemistry from Purdue University, with an editing/writing core certificate from the American Medical Writer's Association and over 13 years of experience in the biotechnology industry.

Company-specific information is obtained mainly from industry trade publications, academic journals, news and research articles, press releases and corporate websites, as well as annual reports for publicly-held firms. Additionally, sources of information include publically available reports, publications, and other resources. Where possible and practicable, the most recent data available have been used.

Some of the statistical information was taken from Biotechnology Associates' databases and from TriMark's private data stores. The information in this study was obtained from sources that we believe to be reliable, but we do not guarantee the accuracy, adequacy or completeness of any information or omission or for the results obtained by the use of such information. Key information from the business literature was used as a basis to conduct dialogue with and obtain expert opinion from market professionals regarding commercial potential and market sizes. Senior managers from major company players were interviewed for part of the information in this report.

### ***Primary Sources***

TriMark collects information from hundreds of Database Tables and many comprehensive multi-client research projects, as well as Sector Snapshots that it publishes annually. TriMark extracts relevant data and analytics from its research as part of this data collection.

### ***Secondary Sources***

TriMark uses research publications, journals, magazines, newspapers, newsletters, industry reports, investment research reports, trade and industry association reports, government-affiliated trade releases and other published information as part of its secondary research materials. The information is then analyzed and translated by the Industry Research Group into a TriMark study. The Editorial Group reviews the complete package with product and market forecasts, critical industry trends, threats, and opportunities, competitive strategies and market share determinations.

### ***TriMark Publications Report, Research and Data Acquisition Structure***

The general sequence of research and analysis activity prior to the publication of every report in TriMark Publications includes the following items:

- Completing an extensive secondary research effort on an important market sector, including gathering all relevant information from corporate reporting, publicly-available data and proprietary databases.
- Formulating a study outline with the assigned writer, including important items, as follows:
  - Market and product segment grouping, and evaluating their relative significance.
  - Key competitors' evaluations, including their relative positions in the business and other relevant facts to prioritize diligence levels and assist in designing a primary research strategy.
  - End-user research to evaluate analytical significance in market estimation.
  - Supply chain research and analysis to identify any factors affecting the market.
  - New technology platforms and cutting-edge applications.
- Identifying the key technology and market trends that drive or affect these markets.
- Assessing the regional significance for each product and market segment for proper emphasis of further regional/national primary and secondary research.
- Completing a confirmatory primary research assessment of the report's findings with the assistance of expert panel partners from the industry being analyzed.

## **1.5 Aims of This Report**

This report was developed with the aim of presenting the following body of knowledge:

- Summaries of various microscopy technology platforms, including light, confocal, electron, ion and scanning probe microscopes.
- Market segment size, growth-rate projections, major players and competitive strategies for the microscopy market segment.
- In-depth descriptions of companies in the field and trends in technology and business that impact this market segment.
- Detailed comparative analyses of individual products.
- Descriptions of attachments used in microscopy.
- Accurate and current R&D information from the major microscopy companies, including descriptions of products currently in development, perceived medical and other market needs, market outlook, economic considerations, and pricing for the microscopy market segment.
- Identification of unmet needs in current microscopy development markets and to what extent each product meets those needs.

## 1.6 Executive Summary

The global market for microscopes and accessories was estimated at \$ [REDACTED] in [REDACTED] and is expected to reach \$ [REDACTED] in [REDACTED], with an average annual growth rate of [REDACTED] % to [REDACTED] %. Between [REDACTED] and [REDACTED], the microscopes market declined by more than [REDACTED] %, with market contraction resulting from the worldwide economic downturn. However, as the economy rebounds scanning probe microscopes and charged particle microscopes are expected to have the most rapid growth rates. The growing field of nanotechnology is expected to have significant impact on the semiconductor industry. The ability to characterize and manipulate nanoscale structures will be most applied using scanning-tunneling microscopes (STMs) and atomic force microscopes (AFMs).

Charged-particle microscopes have the largest market share of any product segment and are one of the fastest-growing segments. Market share for these microscopes that decreased during the worldwide recession are expected to rebound with an average annual growth rate of [REDACTED] % until [REDACTED]. The scanning-probe-microscopes segment has the highest projected annual growth rate ([REDACTED] %) through [REDACTED] and a projected market share as high as [REDACTED] %. Conversely, optical microscopes have the lowest growth rate, and as a result, this segment is expected to lose market share significantly over the next five years. Optical microscopes also lost market share in [REDACTED], but are expected to rebound in [REDACTED].

The microscope industry is complex, heterogeneous and encompasses several sectors including high-tech industrial equipment and manufacture, research and healthcare. The industry has had a major shift towards nanotechnology. Competition among microscope manufacturers has driven the industry to create integrated instrumentation and provide intense technical support. Automated microscopes used in the manufacturing industry are expected to rebound in late [REDACTED] up to [REDACTED] % after the cyclical downturn in [REDACTED], as business conditions improve.

The U.S. accounted for the largest share of the global microscope market in [REDACTED], with over [REDACTED] % of the market for all types of microscopes. Japan had the second-largest market share, with [REDACTED] % of the global market, followed by the European Union (E.U.) with [REDACTED] % and other Asian countries with [REDACTED] %. However, geographical market shares varied with this type of technology. From the data presented in this report, the following trends can be derived:

- Unit sales growth drives revenue moderately, with the differential reflecting the continued trend to value-added, application-specific systems.
- Light microscopy accounts for approximately [REDACTED] % of microscope revenues and more than [REDACTED] % of units sold. Light microscopy revenues are expected to decrease to [REDACTED] % of the total microscopy market by [REDACTED], in view of the overall lower growth of this segment compared with the other high-growth segments.
- When light microscopy is removed from consideration, revenue growth for the remaining microscopy segments increases to the high teens. Also, [REDACTED] % of remaining revenues and [REDACTED] % of unit sales derive from electron microscopy.
- Scanning probe microscopy is anticipated to grow at an accelerated rate of approximately [REDACTED] % through [REDACTED], while confocal, electron and ion microscopy will exceed the light microscopy market growth by about [REDACTED] %.
- The “big four” light microscope companies continue to dominate the U.S. market overall.
- Electron microscope manufacturers occupy a second tier in revenue market share and the “big four” electron microscope manufacturers continue to dominate the world market.
- A third tier is composed of companies specializing in microscopy, such as scanning probe and three-dimensional microscopy.
- Semiconductor-related microscopy has undergone tremendous growth with recent leveling.
- Medical automated imaging is poised for take-off on the basis of recent regulatory approvals for automated cervical cytology.
- Specialized (*e.g.*, acoustic force) and new (*e.g.*, helium ion scanning) microscopy continue to develop.