

Extreme Ultraviolet (EUV) Lithography Market by Equipment (Light Sources, Masks and Optics), End User (Integrated Device Manufacturer (IDM) and Foundry) and Region (Americas, Europe and Asia Pacific) - Global Forecast to 2028

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Report description:

The EUV lithography market is expected to reach USD 25.3 billion by 2028 from USD 9.4 billion in 2023, at a CAGR of 21.8% during the 2023-2028 period. EUV lithography addresses the limitations of traditional optical lithography, which has reached its physical limits in terms of resolution. The shorter wavelength of EUV light allows for the creation of smaller features and tighter patterns on silicon wafers, enabling the fabrication of advanced microchips with greater transistor density. The key component in EUV lithography is the EUV light source, which involves generating and manipulating highly energetic light at 13.5 nm. This is achieved by using a laser to create plasma from a tin droplet, which emits EUV radiation. The EUV light is then reflected and focused using a series of precisely engineered mirrors to transfer the desired pattern onto a silicon wafer coated with a light-sensitive material called a photoresist.

EUV lithography offers several advantages over previous lithography techniques. First, it allows for a significant increase in chip density, enabling the production of more powerful and complex ICs. Second, it simplifies the manufacturing process by reducing the number of steps required for pattern transfer, enhancing production efficiency. Lastly, EUV lithography enables better control over critical dimensions and reduces pattern variability, resulting in improved chip performance and yield. EUV lithography plays a critical role in the production of advanced ICs for various applications, including high-performance computing, artificial intelligence, and mobile devices.

Foundries are expected to grow at the highest CAGR during the forecast period.

In the realm of business, a foundry is a specialized manufacturing facility that offers semiconductor fabrication services to semiconductor companies and integrated device manufacturers (IDMs). Foundries primarily focus on the manufacturing process of

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the semiconductor industry and do not engage in chip design. Foundries play a vital role in the semiconductor industry by providing manufacturing services to companies that either lack their own fabrication facilities or opt to outsource their chip production.

Fabless companies and IDs collaborate with foundries to transfer their chip designs, known as intellectual property (IP), to the foundry for fabrication. Prominent foundries that offer semiconductor manufacturing services, including EUV lithography, encompass companies such as Taiwan Semiconductor Manufacturing Company Limited, GlobalFoundries, Samsung Foundry, and others. The growth of foundry companies can be attributed to their significant investments in EUV lithography, with Asia Pacific countries serving as major contributors to the expansion and advancement of the EUV lithography market.

The EUV mask segment is expected to grow at the 2nd highest CAGR of the EUV lithography equipment market during the forecast period.

The EUV Mask, also referred to as EUV reticle or EUV photomask, plays a crucial role in the advanced lithography process called extreme ultraviolet lithography (EUVL). EUV lithography is a state-of-the-art technology employed in the manufacturing of next-generation semiconductor devices characterized by smaller feature sizes and enhanced performance. The EUV mask is instrumental in the patterning of integrated circuits on a semiconductor wafer by containing the circuit patterns projected onto the wafer during the lithography process. Unlike traditional optical masks utilized in older lithography techniques, EUV masks are specifically designed to function with ultraviolet light with a wavelength of approximately 13.5 nanometers. They consist of a thin substrate coated with multiple layers of reflective materials, which aid in reflecting and focusing the EUV light onto the wafer, enabling precise and high-resolution patterning. The intricate construction of EUV masks involves advanced manufacturing techniques and rigorous quality control measures to ensure the accuracy and dependability of the circuit patterns. Several companies are involved in the manufacturing of EUV masks and related products, including Toppan Inc., KLA Corporation, ADVANTEST CORPORATION, AGC Inc., and more.

During the forecast period, the Asia Pacific region is expected to grow at the highest CAGR.

The Asia Pacific region holds significant importance in EUV lithography. When examining the EUV lithography market in this region, countries like China, Japan, Taiwan, and South Korea come to the forefront. Taiwan holds the highest market share in the Asia Pacific region.

Taiwan is home to leading semiconductor companies such as Taiwan Semiconductor Manufacturing Company Limited (TSMC), which is the world's largest dedicated semiconductor foundry. TSMC has been at the forefront of adopting and advancing EUV lithography technology, enabling the production of advanced chips with smaller feature sizes and higher performance. The company has made substantial investments in EUV infrastructure and has been instrumental in driving the development and commercialization of EUV lithography systems. With its strong semiconductor ecosystem and commitment to technological innovation, Taiwan plays a crucial role in advancing the capabilities and widespread adoption of EUV lithography in the semiconductor industry. Some companies were innovating new technologies and systems in EUV lithography. For instance, in August 2020, Taiwan Semiconductor Manufacturing Company Limited developed the world's 1st environment-friendly dry clean technique for EUV masks with the motive to replace the traditional clean process. It reduces the usage of water and chemicals from 735 metric tons and 36 metric tons.

The break-up of the profile of primary participants in the EUV lithography market-

-□By Company Type: Tier 1 - 30%, Tier 2 - 50%, Tier 3 - 20%

-□By Designation Type: C Level - 25%, Director Level - 35%, Others - 40%

-□By Region Type: North America- 35%, Europe - 30%, Asia Pacific - 25%, RoW - 10%,

The major players in the EUV lithography market are ASML (Netherlands), Carl Zeiss AG(Germany), TOPPAN Inc.(Japan), NTT Advanced Technology Corporation(Japan), KLA Corporation(US), ADVANTEST CORPORATION(Japan), Ushio Inc.(Japan), SUSS MicroTec SE(Germany), AGC Inc.(Japan), Lasertec Corporation(Japan), NuFlare Technology(Japan), Energetiq Technology Inc.(US), Photronics, Inc.(US), HOYA Corporation(Japan), TRUMPF(Germany), Rigaku Corporation(Japan), Edmund Optics Ltd.(US), Park

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Systems(Korea), Zygo Corporation(US), Imagine Optic(US) and Applied Materials, Inc.(US).

Research Coverage

The report segments the EUV lithography market and forecasts its size based on equipment, end user, and region. The report also provides a comprehensive review of drivers, restraints, opportunities, and challenges influencing market growth. The report also covers qualitative aspects in addition to the quantitative aspects of the market.

Reasons to buy the report:

The report will help the market leaders/new entrants in this market with information on the closest approximate revenues for the overall EUV lithography market and related segments. This report will help stakeholders understand the competitive landscape and gain more insights to strengthen their position in the market and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

- Analysis of key drivers (Technological advancements and node migration are driving the market), restraints (High cost of implementing EUV Lithography system), opportunities (Adoption of EUV lithography in advanced semiconductor manufacturing), and challenges (Source power and productivity in EUV lithography act as a challenge for the market) influencing the growth of the EUV lithography market.
- Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the EUV lithography market
- Market Development: Comprehensive information about lucrative markets - the report analyses the EUV lithography market across varied regions.
- Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the EUV lithography market
- Competitive Assessment: In-depth assessment of market shares, growth strategies, and product offerings of leading players like ASML (Netherlands), Carl Zeiss AG(Germany), TOPPAN Inc. (Japan), HOYA Corporation(Japan), TRUMPF(Germany), and KLA Corporation (US).

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