

Semiconductor Etch Equipment - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

Market Report | 2024-02-17 | 120 pages | Mordor Intelligence

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Report description:

The Semiconductor Etch Equipment Market size is estimated at USD 23.80 billion in 2024, and is expected to reach USD 34.32 billion by 2029, growing at a CAGR of 7.60% during the forecast period (2024-2029).

Key Highlights

- Etching is one of the vital processes in a semiconductor fabrication cycle. This process eliminates the material from the surface of the semiconductor to generate patterns based on its applications. The growth of the semiconductor etch equipment market is highly dependent on the development of the semiconductor wafer deposition and wafer processing industry.
- As per Lam Research, there is a strong demand for etch and other fab equipment owing to several factors, the first being the strengthening of secular tailwinds such as AI, 5G, and IoT. Also, the complexity of manufacturing advanced semiconductor devices continues to increase at a rapid rate, as per the organization, leading to a rise in equipment capacity across all market segments.
- Many major players are investing in the expansion of their fabrication plants. In February 2022, Bosch disclosed its intention to increase the size of its wafer production facility in Reutlingen, Germany. It plans to spend more than EUR 250 million (USD 278.2 million) by 2025 to build expanded production space and the necessary clean-room amenities. Such expansion plans are fueling the growth of the semiconductor etching equipment market.
- However, semiconductors are a widely traded commodity with a complicated manufacturing supply chain. Overly complex customs and trade procedures, requirements, and practices can dramatically disrupt semiconductor supply chains, causing costly barriers that harm businesses and consumers.
- Owing to the outbreak of COVID-19, the industry was riddled with a high deficit and increasing demand, which has led to a significant supply chain gap. The initial spread of the virus led to the shutting down or the reduction of foundry capacity utilization, fearing the decreasing demand for the chips across major sectors, like automotive. The diminished output led to a global shortage of semiconductors as the demand increased despite the initial estimates by semiconductor foundries.

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Semiconductor Etch Equipment Market Trends

Conductor Etching to Hold the Largest Market Share

- Conductor etching equipment is used widely to shape the electrically activated materials used in different parts of the semiconductor device. Even a minimal variation in these small semiconductor structures can lead to an electrical fault impacting the device's performance.
- The increasing demand for miniaturization of semiconductor circuits is anticipated to catalyze the ever-increasing demand for different types of conductor etching equipment, along with the need for high production of multi-film stacks with a minor fault during the forecasted period.
- Conductor etching helps in shaping the electrically active materials of a semiconductor device. The presence of even a slight variation in these miniature structures can degrade device performance. Moreover, with the growing demand for DRAM chips, many players have introduced conductor etch systems for the volume production of advanced DRAMs.
- For instance, Centris Sym3 Y is one of the most advanced conductor etch systems by Applied Materials and is tailored to critical conductor etch applications in 3D NAND, DRAM, and foundry-logic nodes. It enables chipmakers to precisely pattern and shape ever-smaller features in state-of-the-art memory and logic chips.
- Moreover, the growth of usage of conductor etching in Metal Insulator Metal (MIM) capacitors also acts as an opportunity factor for Conductor Etching. MIM capacitors are important components for energy storage, signal filtering, and high-frequency tuning applications.

Asia-Pacific to Witness Significant Growth

- The Asia-Pacific region has the most prominent share of global semiconductor foundries, with major companies such as TSMC, Samsung Electronics, etc. Taiwan, South Korea, Japan, and China have a significant market share in the region.
- According to a survey conducted by the Semiconductor Industry Association in July 2021, China mastered several chip technologies, and its commercial semiconductor industry is still relatively young. Still, the Chinese government is trying to close the gap, investing more than USD 150 billion in semiconductors between 2014 and 2030. Supported by booming markets and these government investments, China is poised to become increasingly competitive in some semiconductor market segments.
- Moreover, as per a report by CNBC in December 2022, China is working on a more than CNY 1 trillion (USD 143 billion) support package for its semiconductor industry, in a major step toward self-sufficiency in chips and to counter the United States moves aimed at slowing its technological advances. Beijing has planned to roll out what is expected to be one of its most significant fiscal incentive packages, allocated over five years, mainly as subsidies and tax credits to strengthen semiconductor production and research activities at home.
- Also, Japan's government is offering financial aid to encourage foreign chip makers to build plants in Japan, which is creating a positive growth outlook for the market. For instance, in June 2022, Japan's Ministry of Economy, Trade and Industry (METI) announced plans to offer subsidies worth up to JPY 476 billion (USD 3.5 billion) for a semiconductor plant being built in Kumamoto Prefecture by Taiwan Semiconductor Manufacturing Co. (TSMC), Sony Group and Denso. Total investment in the plant was expected to reach around USD 8.6 billion, with Japan's government supporting about 40% of the costs.
- A similar trend has also been observed across other countries in the region. For instance, in February 2022, Lam Research, a US semiconductor equipment company, manufactured next-generation core equipment for semiconductor manufacturing in South Korea. These highly selective etching devices support Gate All Around (GAA) and 3D stacking technology. The new equipment is expected to play an important role in developing Samsung Electronics' next-generation memory and system semiconductors.

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Semiconductor Etch Equipment Industry Overview

The Semiconductor Etch Equipment Market is moderately competitive owing to the presence of some established players. The brand identity associated with the companies has a major influence in this market. As the barrier for the new entrants is high in the market due to the high capital incorporated, major players are adopting mergers and acquisition strategies to gain more market share. Some major players operating in the market include Applied Materials Inc., Hitachi High Technologies America, Inc., Lam Research Corporation, and Tokyo Electron Limited.

In June 2022, AlixLab developed a new, innovative method for manufacturing semiconductor components with a high degree of packing, eliminating several steps in the manufacturing process - Atomic Layer Etch Pitch Splitting (APS). According to the company, the method makes the components cheaper and less resource-intensive. The company also announced the completion of the Atomic Layer Etch (ALE) equipment hook-up in its clean room at ProNano RISE in Lund, Sweden.

In February 2022, Lam Research Corp. announced a new suite of selective etch products that apply breakthrough wafer fabrication techniques and novel chemistries to support chipmakers in developing gate-all-around (GAA) transistor structures. Composed of three new products, Argos, Prevos, and Selis, the company's selective etch portfolio provides a powerful advantage in the design and manufacture of advanced logic and memory semiconductor solutions.

Additional Benefits:

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

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