

Global Dielectric Etchers - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Global Dielectric Etchers Market is expected to register a CAGR of 5.4% during the forecast period.

Key Highlights

- An increase in demand for neuromorphic chips will drive the market for etchers. The rising demand for artificial intelligence, data processing & analytics is a major factor influencing the innovation & adoption of neuromorphic chips across the globe. Etch techniques aid in creating chip features by eliminating coatings and materials put on the wafer selectively. These procedures entail producing increasingly small and intricate features with difficult-to-remove material combinations.
- The latest trend in the global dielectric etchers market is the emergence of 3D ICs. With the increasing demand for faster computing devices that consume less amount of energy will significantly drive the demand for 3D chip stacking. The growing need for miniaturizing electronic devices in fields such as Aerospace, Automotive & Medical sectors will drive the demand for dielectric etchers, which are capable of altering structures to a precision of 0 - 10 nm & even at an atomic level.
- Etch methods also produce tall, high-aspect-ratio features, like through-silicon vias (TSVs), which allow chip packaging and micro-electromechanical system integration (MEMS). For instance, Lam Research plasma etch systems provide high-performance and high-productivity capabilities required to build precise structures, ranging from tall and narrow, short and wide, to a few angstroms in size.
- In May 2021, Applied Materials, Inc. announced three new materials engineering solutions that enable its memory customers three new options to scale DRAM and optimize chip performance, power, area, cost, and time to market (PPACT). DRAM manufacturers use black diamond, a low-k dielectric material developed by Applied Materials, to solve logic interconnect scalability problems.
- The outbreak of COVID-19 significantly disrupted the supply chain and production during the initial phase of 2020. The impact was more severe for semiconductor manufacturers, the major end users for semiconductor etch equipment. Due to labor

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shortages, many players in the semiconductor supply chain had to reduce or even suspend their operations. The industry was riddled with a high deficit and increasing demand, which led to a significant supply chain gap. The initial spread of the virus led to the shutting down or reduction of foundry capacity utilization, fearing the decreasing demand for chips across major sectors, like the automotive. Diminished output led to a global shortage of semiconductors as demand increased, despite the initial estimates by semiconductor foundries.

Dielectric Etchers Market Trends

Demand for Neuromorphic Chip to Boost Dielectric Etchers Market

- A neuromorphic chip is a data processor inspired by biological brain processing ability to achieve high-speed & low power learning and constructed with capabilities of millions of neurons. The size of these chips is small enough to go mobile, and applications are broad.
- Besides, AI-based startups are increasing day by day. The technologies enabled by AI require neuromorphic chips for processing. Therefore, the rising demand for artificial intelligence, data processing & analytics is a major factor influencing the innovation & adoption of neuromorphic chips across the globe, which in turn is expected to drive the market for dielectric etchers.
- The rising demand for artificial intelligence, data processing, and analytics is a significant factor that drives the adoption of neuromorphic chips worldwide, thereby creating the need for dielectric etchers. Moreover, rapid technological upgradation of Internet of Things applications for advanced intelligent devices is also anticipated to boost the demand for technologically advanced semiconductors. This, in turn, is predicted to create significant demand for dielectric etching in the market.
- DRAM is in high demand due to the global economy's digital transition. The Internet of Things creates significant additional computer devices at the edge, resulting in an exponential rise in data that is transported to the cloud for processing. The industry needs advancements that would allow DRAM to scale down in size and cost while running at greater speeds and consuming less power, which drives the market growth.
- Smartphones and other applications in the consumer electronics market that require semiconductor ICs drive the demand for dielectric etcher. Furthermore, as the number of Internet of Things (IoT) devices grows, the semiconductor industry aims to invest in this technology to produce more innovative products.

Asia Pacific Region to Hold a Significant Share

- Integrated Device Manufacturers (IDM) such as Qualcomm, Broadcom Ltd., Nvidia, MediaTek, Apple, AMD, etc. across the globe are adopting fabless business model, where the organization will design the chipset layout and outsource the manufacturing to chipset manufacturers such as TSMC, UMC & SMIC. The fabless business model helps organizations to concentrate their efforts on investing profits in research and development of new technologies while maintaining the high production volumes needed to maintain sales.
- Organizations such as TSMC, UMC, DB Hitek, SMIC, etc. utilize their foundries to produce the chipset according to the specifications and volumes requirement of the customers. A major share of these foundries operates from China, Taiwan & South Korea.
- Atomic layer etching (ALE) is a sophisticated etching process that provides superior depth control on shallow structures. As device feature size shrinks, ALE becomes increasingly necessary to attain the accuracy required for enhanced performance.
- The production of advanced microelectronic devices requires high-fidelity pattern transfer (etching). As features drop to sub-10nm sizes and new devices use ultra-thin 2D materials, atomic-scale accuracy becomes more important. This raised the

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demand for atomic layer etching (ALE), a technique that overcomes the limits of traditional (continuous) etching at the atomic level.

- TSMC has been Apple's exclusive manufacturer of Apple's A-series chips. This chipset will be fabricated using a 7-nanometer chipset called A13. Besides, with automotive electronics industry flourishing exceedingly in the region, Asia-Pacific is providing a plethora of opportunities for market growth.

Dielectric Etchers Industry Overview

The Global Dielectric Etchers Market is very competitive in nature. The market is highly concentrated due to the presence of various small and large players. All the major players account for a large share of the market and are focusing on expanding their consumer base across the world. Some of the significant players in the market are Applied Materials Inc., Hitachi High-Technologies Corporation, Lam Research Corporation, Tokyo Electron, Mattson Technology, Inc., Advanced Micro-Fabrication Equipment Inc., and many more. The companies are increasing the market share by forming multiple partnerships and investing in introducing new products to earn a competitive edge during the forecast period.

- July 2022 - Tokyo Electron and IBM collaborated for the latest front 3D chip stacking that removes the need for a glass wafer base, streamlining the process. IBM and Tokyo Electron, however, have found a way to enable silicon carrier wafers for 3D chipmaking without the drawbacks. This process was demonstrated using a new 300mm module, which the companies say is the first 3D stacked silicon chip wafer at the 300mm level. IBM hopes that the considerable investments in 3D chip stacking technology can help streamline the production process of semiconductors and offer a silver lining to the global chip shortage.
- June 2022 - Lam Research collaborated with SK Hynix to enhance DRAM production cost efficiency with dry resist Extreme Ultraviolet technology. Lam's innovative dry resist fabrication technology is a development tool for two key process steps for producing advanced DRAM chips. This technology introduced by LAM in 2020, dry resist, extends the yield, resolution, productivity, and of EUV (Extreme Ultraviolet) lithography, a pivotal technology in producing next-generation semiconductors. At the material level, Lam's dry resist technology addresses EUV lithography's biggest challenges, enabling cost-effective scaling for advanced memory and logic.

Additional Benefits:

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

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