Plasma Etching Equipment - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The Plasma Etching Equipment Market is expected to register a CAGR of 7.8% during the forecast period.

Key Highlights
- Plasma etching is a sophisticated, versatile technology that creates a wide range of devices. Today, semiconductor manufacturers are switching to the plasma etch system from traditional wet etching, as it consumes fewer chemicals and is more suitable for automation and single wafer manufacturing. Increasing demand for compact, energy-efficient electronic devices having improved performance is boosting the need for developing miniature semiconductor integrated circuits (ICs). For miniaturizing IC, the course has to undergo an advanced circuit fabrication process with small geometries and thus requires precise pattern transfer.
- Plasma etching is used extensively in the semiconductor and microelectromechanical systems industries. For instance, in manufacturing printed circuit boards (PCBs), isotropic etching is used to plasma clean circuits after machining and before electroplating. Anisotropic etching is used to form circuit patterns in wafers. This anisotropic plasma etching is highly energetic and called reactive ion etching (RIE).
- Moreover, massive technological upgradation taking place in the IoT application to offer technologically advanced intelligent devices to different consumers across the globe is also predicted to accelerate the demand for advanced semiconductors, thereby positively affecting the market's growth. With the growth in IoT applications, smart devices are increasing, giving rise to miniature semiconductors, thus raising the demand for plasma etching.
- Smartphones and other applications that require semiconductor ICs are other factors driving the overall demand for plasma etching in consumer electronics, automotive, and other industries, as technology advancements like wireless technologies (5G) and artificial intelligence have significantly impacted the trend of these sectors. Also, the increasing number of Internet of Things (IoT) devices is expected to force the semiconductor industry to invest in this equipment to attain intelligent products. The SEMI

Silicon Manufacturers Group (SMG) revealed in its quarterly review of the silicon wafer industry that worldwide silicon wafer shipments grew 3.3% to 3,649 million square inches in the third quarter of 2021, which was a new industry high. Shipments of silicon wafers in the third quarter of 2021 increased by 16.4% over the same quarter the previous year, to 3,135 million square inches.

- However, this equipment is often costlier than wet-chemical etching equipment. Also, due to faster consumption of resists due to wet chemical etching, the selectivity offered by this equipment is reduced compared to wet-chemical etching equipment. These are some of the primary factors challenging the growth of the market.
- The COVID-19 pandemic halted the manufacturing of several items in the semiconductor production equipment industry, owing to continued lockdown in most regions across the world. Lockdown measures reduced demand for consumer electronic gadgets, which had a global impact on the semiconductor sector. The continued decline in worldwide demand and export shipments for automobiles provided a negative impact on the semiconductor market, which is currently slowing the demand for semiconductor manufacturing equipment. However, the demand is expected to gain traction gradually with the industrial activities returning back to the pre-pandemic level.

Plasma Etching Equipment Market Trends

Consumer Electronics Segment to Drive the Demand

- The electrical and electronics industry includes a wide range of products, including aerospace products, lamps and light fixtures, including light-emitting diodes, consumer electronics, such as television sets, electrical household appliances, electronic medical equipment, microelectronic components, and automotive software, and electrical and electronic components, like on-board diagnostics (OBD), in-car touch screens, cameras, and navigation systems. Another key factor driving the semiconductor industry's growth is the expanding consumer electronics sector.
- People worldwide were forced to work, learn, and spend their free time at home due to the COVID-19 pandemic, which increased the demand for consumer electronics. Many electrical devices, however, are still in low supply due to a global lack of chips and supply chain bottlenecks. Compared to the previous year, the global electrical and electronics sector did not grow in 2020. The industry was predicted to grow in 2021 and is expected to grow in 2022, as the concerns linked to COVID-19 are being increasingly addressed. According to ZVEI, a German association of the electrical and digital sector, the industry was predicted to grow by 6% globally between 2021 and 2022.
- Emerging economies, such as India, have witnessed a reduction in data costs by 95% since 2013, resulting in tremendous growth in smartphone users. According to ASSOCHAM, smartphone users in India were expected to double from 468 million users in 2017 to approximately 859 million by 2022, at a CAGR of 12.9%. Such significant volume growth in smartphone adoption is expected to create a demand for semiconductors in the smartphone industry. Moreover, the appliances and consumer electronics industry is expected to double, to reach USD 21.18 billion by 2025, in India, according to the Indian Brand Equity Foundation.
- Increasing investment and supportive regulations being framed by governments worldwide to meet some portion of their local demand are creating a good market scenario for the studied market growth.
- Furthermore, the growing demand from the consumer electronics industry is also encouraging semiconductor manufacturers to expand their production facilities. For instance, in October 2021, Taiwan Semiconductor Manufacturing Company Ltd (TSMC) announced its plans to build a new semi-specialist factory in Japan to meet the needs of local customers. The factory will be the most advanced logic factory in Japan when it operates in the second half of 2024. Such expansions will create opportunities for the studied market to grow.

Asia-Pacific is Expected to Witness Significant Growth

- Asia-Pacific is one of the prominent markets for plasma etching equipment, primarily attributed to the presence of some of the leading semiconductor manufacturers, growing demand for advanced technologies across numerous end-user industries, high consumer electronics industry growth, and supporting government policies for the semiconductor industry in the region.
- Growing demand for smart and portable devices is also anticipated to boost the demand for miniature integrated circuits (ICs), which is expected to rapidly fuel the need for the plasma etching equipment market over the forecast period. According to GSMA, China's unique mobile subscriber rate is among the highest in the world. While it was 1.22 billion in 2020, it is estimated to reach 1.26 billion in 2026, approximately 85% of the total population.
- The governments in many countries across the region are supporting the semiconductor industry. For instance, China has continuously introduced policies to support the localization of the semiconductor industry. The "Made in China 2025" initiative has provided a clear roadmap for the localization of semiconductor equipment production. According to SEMI, in recent years, many new 12-inch fab projects have been announced, started construction, or are in the ramp-up stage in China, including UMC in Xiamen, TSMC in Nanjing, PSC in Hefei, GLOBALFOUNDRIES in Chengdu, as well as YMTC in Wuhan and Nanjing.
- Similarly, several semiconductor manufacturing companies are increasing their investment to establish manufacturing facilities in India after the government announced several PLI schemes. For instance, in August 2022, Polymatech, a Tamil Nadu based semiconductor chip manufacturer, announced an investment worth USD 1 billion to expand its manufacturing facilities.

Plasma Etching Equipment Industry Overview

The plasma etching equipment market is competitive. There is enormous competition among the vendors owing to the intense market penetration of some existing players in the market expected to grow further. Some major players include Applied Materials Inc., Lam Research Corporation, and Tokyo Electron Ltd., among others.

- March 2022 - Samco, an etching, deposition, and surface treatment processing equipment manufacturer, introduced the new plasma etching cluster tool 'Cluster H.' By leveraging its cutting-edge plasma technology, Cluster H provides the full-scale production capabilities for compound semiconductor devices such as SiC/GaN power devices, high-frequency filters, GaAs VCSELs, CMOS image sensors, micro-OLED/LED, and advanced packaging.
- March 2022 - APTC, a dry etching equipment maker, announced that it is developing a 300mm oxide etching equipment to offer for a demo text in 2023. APTC offered etching equipment that uses a plasma source to etch polysilicon first. With this, the company focuses on further expanding its presence in the dry etching equipment market.

Additional Benefits:

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

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