

Indium Phosphide Wafer Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The indium phosphide wafer market is expected to reach USD 268.29 million by 2027, registering a CAGR of 13.97% during the forecast period. Indium phosphide (InP) has properties that produce highly efficient lasers, modulators, and sensitive photodetectors. It can also generate laser signals and convert and identify those signals back to the electronic form. These are used for company networks and data centers, long-haul optical fiber connections over far distances, wireless connections for 3G, 5G, and LTE base stations, and satellite communication. The growth in such requirements is driving the market.

Key Highlights

Indium phosphide wafers are increasingly adopted in the manufacture of LiDAR for automotive, 3D sensing, consumer wearables, and the growth in datacom in the telecommunication sector. This is expected to drive the market during the forecast period. In addition, some of the major applications of InP include 5G communications, data center connectivity that uses lights and lasers, fiber optic lasers and detectors, silicon photonics, RF amplifiers, and switches used in military and 5G communications, and infrared thermal imaging in health.

Electronic components known as optoelectronic devices detect and regulate light. They convert electrical information into infrared or visible energy and vice versa. It is utilized in photovoltaic power supply, optical fiber communication systems, monitor and control circuits, and electric eyes. Optoelectronic components are used in quantum cascade lasers and injection laser diodes for stimulated emission. LEDs and image sensors are utilized in digital imaging systems, packaging, and safety applications.

According to the Ericsson Mobility Report published in November 2020, the global mobile data traffic was estimated to reach around 51 EB (exabytes) per month by the end of 2020. This was projected to grow by a factor of almost 4.5 to reach 226 EB per month in 2026. This figure represents the mobile data that will be consumed by greater than 6 billion people using smartphones, laptops, and a multitude of new devices at a time.

The semiconductor silicon wafer serves as the foundation of the electronics industry and is the main component of many

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microelectronic devices. With the current advances in the technology landscape, electronic mobility, and digitalization, these items are finding use in a wide range of devices. The requirement for additional capability from a single device has also grown dramatically as a result of the need for small-sized gadgets, which boosts the price of the silicon wafer.

The COVID-19 pandemic has halted the manufacturing of several items in the semiconductor production equipment industry owing to the continued lockdown in most regions across the world. Lockdown measures reduced the 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 caused a negative impact on the semiconductor market, which is currently slowing down the demand for semiconductor manufacturing equipment.?

Indium Phosphide Wafer Market Trends

Consumer Electronics Segment Expected to Drive the Market

Wearable technology, a developing trend, integrates electronics into daily activities and addresses the changing lifestyles with the ability to be worn on any part of the body. Factors such as the ability to connect to the internet and provide data exchange options between a network and a device are leading to the trend of wearable technology.

According to Cisco Systems, the number of connected wearable devices globally has doubled in the span of three years, increasing from 325 million in 2016 to 722 million in 2019. The number of devices is forecasted to be over 1 billion by 2022. Further, according to the Ministry of Internal Affairs and Communications (Japan), as of 2021, over 7% of households in Japan owned a wearable device. The household penetration rate of wearable devices steadily increased throughout the surveyed period (2014-2021), rising from 0.5% in 2014 to 5% in 2020.

The rising rates of urbanization in various parts of the world have driven the demand for advanced, aesthetically appealing products that possess the ability to serve the consumers' requirements better, such as multiple features in one device and time schedules. Moreover, the vast millennial population across the globe has been quick to adopt smartwatches, owing to the increased spending ability on their regular work hours tracking and luxury standards.

For instance, according to Ericsson, the number of smartphone subscriptions worldwide witnessed an upsurge from 5,924 million in 2020 to 6,259 million in 2021. The number is estimated to reach 7,690 million in 2027.

Further, according to the Nokia annual mobile broadband index report 2022, the growing ecosystem of 4G-capable devices is driving the growth in 4G subscribers and data consumption. India recorded the highest-ever shipment of over 160 million smartphones, including 30 million 5G devices, in 2021, with active 4G capable devices crossing 80% and the number of active 5G capable devices crossing 10 million. The Nokia report also forecasted that user adoption will increase to 60-75% of the smartphone user base by 2025.

Asia-Pacific Expected to be the Fastest-growing Market

The Asia-Pacific region commands a prominent share of semiconductor foundries globally, with major companies such as TSMC and Samsung Electronics. Taiwan, South Korea, Japan, and China have a significant market share in the region. According to the US Semiconductor Industry Association (SIA), the US share of the global installed wafer fab capacity constantly declined from 1990 to 2020. During the same period, Asia saw a meteoric rise in developing new fabs to the point where it now accounts for a significant share of the world's capacity.

China has a very ambitious semiconductor agenda. Backed by USD 150 billion in funding, the country is developing its domestic IC industry and plans to make more of its chips. Greater China, which encompasses Hong Kong, China, and Taiwan, is a geopolitical hotspot. The US-China trade war is compounding tensions in an area where all the leading process technology is located, forcing

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many Chinese companies to invest in their semiconductor foundries.

China's new five-year plan for 2021-2025, announced in March 2021, established that boosting basic research was a critical priority. The central government's spending on basic research was expected to increase by 11% in 2021, well above the 7% planned for the overall R&D investment and the 6% target for GDP growth. Semiconductors were designated as one of the seven areas that will be given priority in terms of funding and resources. Firms involved in design develop nanometer-scale integrated circuits that perform the critical tasks that make electronic devices work, such as computing, storage, network connectivity, and power management. The profit was estimated to more than double in 2021 because of the robust chip demand. China's leading semiconductor foundry set aside a record sum for capacity development in 2022. This year, Semiconductor Manufacturing International Corp (SMIC) set aside USD 5 billion for capital spending, up from USD 4.5 billion in 2021.

China is moving significantly closer to self-reliance in 7 nm chip production. China has made breakthroughs in its 7 nm chip-making process, reportedly developing tools and know-hows for several segments of the manufacturing process amid efforts to reduce reliance on foreign equipment and material vendors.

The significant research and partnership growth further bolsters the market growth rate. For instance, LioniXInternational (LXI) and the Institute of Microelectronics Chinese Academy of Science (IMECAS) agreed to expand their Photonic Integrated Circuit (PIC) platform partnership by actively supporting the functionality and offering both platforms. The critical platforms in the PIC landscape include Silicon On Insulator (SOI), Indium Phosphide (InP), and the silicon nitride-based TriPleXplatform. These platforms are available through Multi-Project Wafer (MPW) access.

Indium Phosphide Wafer Market Competitor Analysis

The growing presence of large manufacturers in the indium phosphide wafer manufacturing sector is expected to intensify competitive rivalry during the forecast period. Market incumbents, such as JX Nippon Mining & Metals Corporation and Powerway Advanced Material Co. Ltd, considerably influence the overall market.?

March 2022: Intel revealed plans for a second new "Megafab," a chipmaking site in Germany, with an expected USD 88 billion in investments across several European countries. Further, in August 2021, ACM Research Inc. launched its Bevel Etch product, which further expanded ACM's comprehensive offering of wet tools. This tool minimizes the impact of edge contamination for subsequent process steps and improves chip manufacturing yield.

February 2022: The Government of Canada announced a significant investment in the Canadian semiconductor and photonics industries. The investment of CAD 240 million will help solidify Canada's role as a global leader in photonics and will bolster the development and manufacturing of semiconductors. Over 100 domestic and international semiconductor companies work on microchip research and development in Canada. There are over 30 applied research laboratories and five commercial facilities for areas including compound semiconductors, microelectromechanical systems (MEMS), and advanced packaging.

Additional Benefits:

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

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