

Industrial Laser System Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The industrial lasers market is anticipated to witness a CAGR of 7.1% during the forecast period. The various technological advancements in the industrial environment, such as industrial automation, industrial robots, 3D Printing, etc., due to the advent of Industry 4.0 and Industrial IoT, are expected to boost the adoption of laser systems in industries. Companies integrate the existing manufacturing processes with several technological advancements across lasers and laser systems to enhance productivity and stay ahead of the competition.

Key Highlights

The various technological advancements in an industrial environment, like industrial automation, industrial robots, 3D Printing, etc., due to the advent of Industry 4.0 and Industrial IoT, are expected to boost the adoption of laser systems in industries. The demand for precision in manufacturing and other industries is also adding to the adoption of laser solutions in the end-user industries.

Lasers find applications in various industries in different forms and types, but a prominent share of their application lies in material processing. According to Laser Focus World, optical fiber laser sources are being used mainly for material processing, followed by Direct Diode Laser.

With the proliferation of automation and growing demand for precision manufacturing, lasers are witnessing higher application and demand. Companies are integrating the existing manufacturing processes with several technological advancements across lasers and laser systems to enhance productivity and stay ahead of the competition.

In addition, the global investment in automation is expected to accelerate even further due to the conditions created by the pandemic resulting in higher demand for CNC systems and process automation, where the demand for laser-based equipment for drilling, cutting, and marking is increasing. According to UBS, by 2021, the global automation investment specific to process automation was expected to command a prominent share at USD 74.0 billion.

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Due to the growing demand for laser-based solutions, various vendors are looking to expand their product offerings. For instance, MKS Instruments Inc. launched the spectra-physics Talon 355-45, a high-power UV laser that results in faster UV processing at a significantly lower cost per part. It is ideal for the industrial manufacturing of PC boards, electronic components, semiconductors, flat panel displays, lithium-ion batteries, and LEDs for consumer electronics, clean energy, and other demanding applications. The impact of the COVID-19 crisis has forced businesses to adhere to strict requirements to ensure the ongoing safety of their employees and customers alike. As a result, the need for automation has witnessed a sudden spike. This could be observed as a notable trend in the foreseeable future.

Under these circumstances, manufacturing industries worldwide witnessed a significant decline in revenue and profits, leading to a significant cut down of employees and workers and an overall loss to industrial production activities.

Few industries, such as food and beverage and pharmaceutical, were deemed essential by governments. However, the manufacturing industry shrunk significantly due to the pandemic as the industry faced unprecedented challenges in the supply chain and procurement of raw materials, which resulted in significant losses for manufacturers.

However, industrial laser systems are being adopted in several end-user industries, such as aerospace and defense, automotive, medical, and semiconductor, amongst others. In the automotive sector, laser systems deployed are used mainly for cutting and welding applications. This enables higher productivity and reduction of downtime while substantially reducing manufacturing costs. Also, in the aerospace and defense industry, extensive manufacturing capabilities encompass all areas of metal fabrication, joining, and coating.

Industrial Laser System Market Trends

Semiconductor and Electronics Segment Is Expected To Grow Significantly

Laser-based equipment plays a vital role in the manufacturing and processing of semiconductors; two of the widely used lasers in wafer manufacturing are near-infrared (NIR) and green lasers. NIR Lasers are versatile and suitable for many machine applications like semiconductor creation. They are effective because of the energy range that falls squarely within the spectral field needed to make wafers' necessary markings.

Green lasers are the result of second-harmonic generation processes, also called frequency doubling. This technology helps combine two photos to make a new one with twice the energy. This amplifies the power while conserving the coherence of the laser. Laser marking helps in the traceability and readability of wafers across the market and is one of the necessary steps in wafer manufacturing.

The global demand for silicon wafers is increasing at a rapid pace, with a shortage of chips in various industries currently, such as automotive, which is expected to fuel the demand. According to data published by Semiconductor Equipment and Materials International, in 2020, the global silicon wafer demand stood at 12.41 billion square inches, which was 11.81 billion square inches during the previous year. Since the slump in demand and overall market demand fluctuation faced in 2019, the global market is expected to witness accelerated growth in the coming years, augmented by growing demand for electronics.

A prominent share of the application of laser equipment is in semiconductor processing and PCB processing. This equipment is used for the removal process, bonding process, inspection, metrology, and reforming process; the use of lasers results in higher yields and throughput, reduces the risk of breakage/die quality, avoids particles with no residue, and is cost-effective. Nanosecond and Picosecond types of lasers are expected to command a prominent share of the market, followed by CO₂, Femtosecond, and Excimer, in that order.

Apart from the semiconductor industry, the application of laser equipment in the electronics manufacturing process is significant. Laser applications like micro-drilling where prominent vendors, such as IPG Photonics, have significant product offerings. With the proliferation of IoT, IIoT, and smart home solutions, the demand for lasers is expected to increase rapidly in the manufacturing process.

With the reduced replacement rate of smartphones due to innovation and the growing push toward the adoption of 5G, the

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demand for smartphones and connected devices capable of 5G connectivity are expected to witness high demand over the coming years.

According to Ericsson's June 2021 report, over 160 communications service providers launched 5G services, and over 300 5G smartphone models were announced or launched commercially; the report estimated half a billion 5G users across the world by the end of 2021. At the end of 2020, smartphone penetration among mobile phone subscriptions stood at 76%, with 6 billion smartphone subscriptions, and it is expected to reach 7.7 billion within the next four years, with smartphones reaching 88% penetration among mobile users.

Such accelerated demand in electronics is expected to increase the demand for laser-based manufacturing and inspection equipment and impact the demand for semiconductor equipment.

North America is Expected to Hold Significant Share

The market is expected to be dominated by North America due to technological improvements in various sectors, including manufacturing, aerospace, and automotive. Similarly, the site is home to several significant vendors, including IPG Photonics and Coherent Inc.

Increasing product launches by companies in the North American region are expected to contribute to the region's growth. For instance, in August 2021, the ExactWeld IP polymer welding technology was introduced by Coherent. ExactWeld IP is a polymer welding method that generates enormous volumes of distortion- and particle-free welds. A Thermal Vision Check, an incorporated vision system for component identification or offset correction, and an automated laser power calibration module for improved process stability and consistency are all included in the system.

Many businesses, particularly small and medium-sized enterprises (SMEs) and startups, have started raising large sums of money to create cutting-edge laser technological solutions. For instance, UAdventure Capital Fund, based in Tuscan and committed to the commercialization of discoveries, products, technologies, and services from the University of Arizona, invested in DeUve Photonics Inc. to advance its technology, allowing the business to dominate emerging and established deep UV laser markets.

In order to increase productivity and remain ahead of the competition, businesses are fusing current manufacturing processes with technical advancements in lasers and laser systems. For instance, in January 2020, TRUMPF Group acquired GLOphotonics, a French laser technology company focused on hollow-core fibers. The fiber enables more efficient and quick laser light transportation from the source to the intended location without compromising power.

The business of fiber lasers is expected to grow due to the requirement for high-output power and compact power. The great dependability of fiber lasers is expected to propel the industrial laser industry in North America.

Industrial Laser System Market Competitor Analysis

The Industrial Laser Systems Market is highly competitive, owing to the presence of multiple vendors. The market appears to be moderately concentrated. It is home to some of the largest vendors as well as various smaller regional vendors operating and catering to their markets. Vendors in the market are prioritizing research, innovation, and product development as their growth strategy. Such developments enabled the companies to increase their presence in the space. As it is a highly capital-intensive market, the smaller revenue companies are subjected to higher barriers to exit and, in most cases, get acquired by high-revenue companies. Moderate firm concentration and the consolidated state of the market further intensify the competitive rivalry.

January 2022 - TRUMPF established a partnership with Fraunhofer Institute for Laser Technology ILT, an Aachen-based manufacturer of cutting-edge laser beam sources and superior optical parts and systems. Through this partnership, it hopes to advance laser material deposition research and hasten the technology's introduction.

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March 2021 - II-VI Incorporated acquired Coherent Inc. in a USD 6.3 billion deal. II-VI will acquire all outstanding Coherent shares in a cash and stock transaction. Coherent Inc. is one of the world's leading providers of lasers, laser-based technologies, and laser-based system solutions.

Additional Benefits:

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

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