



PROSPECTS FOR THE DEVELOPMENT OF LASER TECHNOLOGIES

Savchenko O.M., Associate Professor, Department of PMTP

A characteristic feature of modernity is the extremely rapid development of technology in all areas of human activity. The development of production causes the ever-increasing introduction of high-tech technologies, which include laser processing of materials. The use of laser processing of materials makes it possible to ensure the high quality of the products obtained, the specified productivity of the processes, environmental friendliness, as well as saving human and material resources. In some cases, ray technologies are out of competition, since lasers can be used to obtain technical and economic results that cannot be achieved by other technical means. Areas of application of laser radiation are very diverse: materials processing, measurement, and control in technological processes, microelectronics and micro-optics, location and navigation, marking of materials and products, surface cleaning, optical communication and fiber technology, additive technologies, medicine, holography, restoration of art products, etc. Powerful laser cutting and welding is the largest segment of the application of laser processing of materials, which in turn has stimulated the growing demand for laser equipment worldwide.

The global market for laser systems for materials processing reached \$17.9 billion in 2019, a decline of 9 percent compared to 2018, Optech Consulting reported in January (Fig.1). The decrease follows nine years of continued growth – from \$5.3 billion in 2009 to a record \$19.8 billion in 2018. In 2017 and 2018 alone, the market increased by 50 percent due to a combination of drivers, including the rapid adoption of laser manufacturing in China, a market push by decreased laser prices, and an end market pull in the consumer electronics and automotive industry [1].

Global Market for Laser Systems for Materials Processing

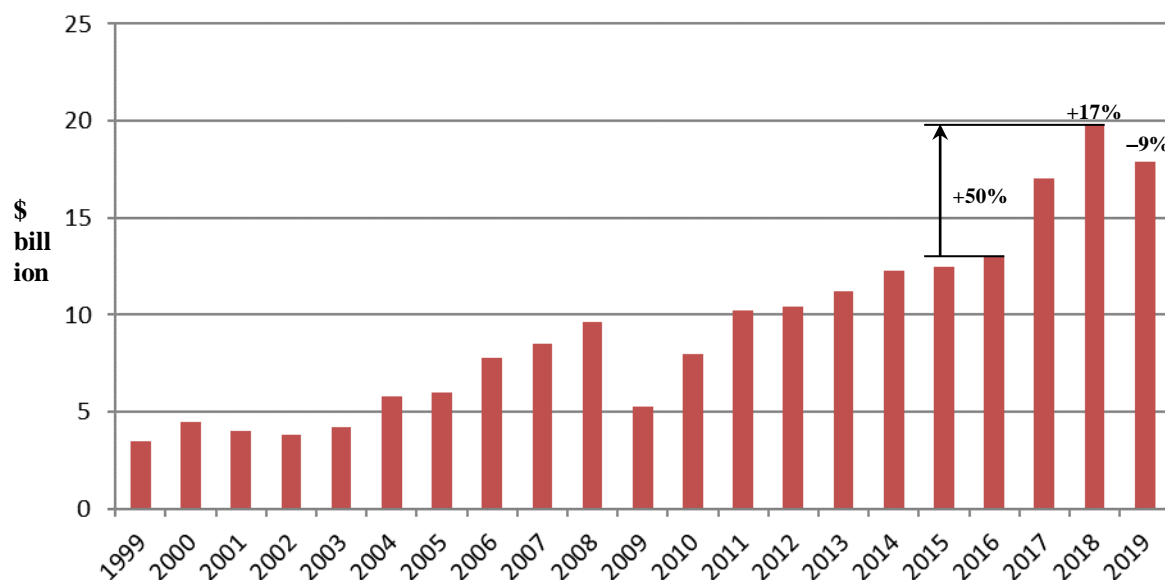


Figure 1 – The global market value of laser materials processing systems in the period from 1999 to 2019



The Laser technology market size is expected to grow from USD 11.7 billion in 2020 to USD 17.6 billion by 2025, at a CAGR of 8.6%. Increasing demand from the healthcare vertical and Better performance of lasers over traditional material processing techniques are the key factors driving the growth of the Laser technology market. The market for solid-type lasers to hold the largest share during the forecast period. In terms of value, APAC led the laser technology market in 2019, accounting for the largest share of the overall laser technology market, by region. The major countries contributing to the laser technology market in APAC include China, Taiwan, Japan, South Korea, Malaysia, Indonesia, Australia, Myanmar, Bangladesh, and India. APAC has been ahead in terms of the adoption of laser technology products and solutions compared with other regions.

Coherent (US), IPG Photonics (US), Trumpf (Germany), Lumentum (US), Jenoptik (Germany), Novanta (US), Lumibird (France), Laser Star (US), Epilog Laser (US), Han's Laser (China), MKS Instruments (US), Gravotech (France), 600 Group (UK), Eurolasers (Germany), Bystronic Lasers (Switzerland), Toptica Photonics (Germany), Photonics Industries (US), Focuslight Technologies (China), Corning Incorporated (US), and Access Lasers (US) are a few major companies dominating the Wireless gas detection market.

Coherent (US) is an industrial and fiber laser solutions provider and deals in technologies such as diode-pumped solid-state laser, fiber laser, gas laser (CO, CO₂, excimer, and Ion), optically pumped semiconductor laser (OPSL), semiconductor laser, and ultrafast laser. These laser technologies have applications in several verticals, including healthcare, scientific research, electronics, military & defense, and manufacturing. Trumpf (Germany) manufactures machine tools, including machines & systems, lasers, power electronics products, power tools, and smart factory solutions, and offers software and services for automotive, manufacturing, construction, electronics, power & energy, aerospace & defense, engineering, and medical & healthcare verticals. Han's Laser (China) is a laser equipment manufacturer and provides laser marking, laser welding, laser cutting, and laser cleaning machines for application in verticals such as IT, automotive, packaging, electronics & semiconductor, and energy & power [2].

The range of equipment used for laser material processing is extremely wide. Most manufacturers supply the market not with individual technological lasers, but with laser technological complexes. They contain external optics devices, controlled tables, manipulators, robots for moving the product during processing, as well as software necessary for the implementation of a particular technology.

References

1. Laser systems market down 9% in 2019. <https://www.lasersystemseurope.com/news/laser-systems-market-down-9-2019>.
2. Laser Technology Market by Type, Revenue, Application, End User, Geography – Global Forecast to 2025. <https://www.marketsandmarkets.com/Market-Reports/laser-technology-market-795>.