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IMPROVING THE USE OF LASER TECHNOLOGIES IN MARKING AND THE PRODUCTION OF GOODS

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Annotation
The effective use of laser technologies is essential in modern industry, as it significantly enhances production efficiency and improves product quality through advanced techniques. Laser technologies are considered one of the most effective methods widely employed in manufacturing and product marking processes. Their exceptional precision, speed, and quality distinguish them from other methods. This article explores the advantages of laser technologies in manufacturing and marking, their practical applications, and future prospects.

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The main advantages of laser technologies are accuracy and speed, no negative impact on raw materials and products, economic efficiency, environmental safety, etc. They are superior to other methods in terms of their qualities.

Use of laser technologies in the production of products. When laser technologies are used in cutting and welding metals, they provide positive results in the automotive, aviation, and electronics industries with their unique accuracy and speed. Laser beams are effectively used to process plastic polymers and glass materials. Laser technologies are widely used in shaping small-structured products. Laser technologies are commonly used in the labeling of goods.

Product information placement. Lasers ensure accurate and long-term marking of product information (for example, barcode, date, serial number). Anti-counterfeiting. Laser technologies prevent counterfeiting by creating unique product features. Aesthetic aspects. Laser-marked products have a high-quality appearance, increasing their market competitiveness.

Prospects for laser technologies: Intelligent manufacturing. Along with the digitalization of the economy, laser technologies are integrated with artificial intelligence and used to create automated production systems.

Development in the fields of medicine and cosmetics. Laser technologies are also finding their place in medicine and the production of cosmetics. Energy-saving technologies. The creation of new types of energy-saving laser equipment will serve the further development of the industry in the coming years.

In our country, laser beams are effectively used in several areas, for example, in the textile industry, they are effectively used in the processing of fabrics by applying patterns and their thinning. In the production of building materials: methods of applying decorative patterns and marking them with a laser on ceramic tiles have been introduced. In the food industry: manufacturer information

and promising signs are applied to product coatings with the help of a laser, which is of great importance in preventing counterfeiting.

The widespread use of laser technologies in Uzbekistan will make a significant contribution not only to the industrial sector but also to the socio-economic development of the country. As a result of the effective use of laser technologies, the competitiveness of production will increase. Laser technologies allow the creation of high-quality and innovative products. This will increase the competitiveness of local enterprises in domestic and international markets.

In creating new jobs. In the process of introducing technologies, new jobs are created, which serves to ensure the employment of the population.

In increasing demand for intellectual labor. Highly qualified specialists are required to use laser technologies, stimulating the development of the education and personnel training system.

In expanding export opportunities. Products created using laser technologies meet international standards, which strengthens the country's export potential. In preventing the production of counterfeit products. Laser marking can prevent the spread of counterfeit products. This not only brings economic benefits but is also of great importance in protecting consumer rights.

In ensuring environmental sustainability. During processing with laser technologies, waste is minimal, which has a positive impact on the environment.

We have developed and implemented new food additives such as "Astosh" using laser beams in the preparation of new food additives based on several plants growing in Uzbekistan. "RIKTA-01" therapeutic apparatus was used in preparation of the "Astosh" food supplement.

To more effectively organize the introduction of laser technologies in our country, it is necessary to develop research and practical work in the following areas: Introduction of laser technologies into the educational process. It is important to organize special courses on laser technologies in technical universities and vocational colleges. Production of local laser equipment. To reduce dependence on foreign technologies, attention should be paid to the production of local laser equipment. For this, it is necessary to support local scientific and practical centers. Strengthening public-private cooperation. It is necessary to implement special programs to strengthen cooperation between the public and private sectors in the introduction of laser technologies. Strengthening international scientific cooperation. To introduce advanced experiences in laser technologies to Uzbekistan, it is necessary to strengthen cooperation with international research centers. Creating broad opportunities for entrepreneurs. It is important to allocate grants and preferential loans from the state for the development of startups based on laser technologies.

The effective use of laser technologies is an important means of ensuring high-quality, accurate, and environmentally friendly production in the industrial sector. The accuracy, speed, economic efficiency, and opportunities for improving product quality of these technologies serve to increase production efficiency. They also provide results such as preventing counterfeiting of products, strengthening competitiveness, and increasing export potential. The widespread use of laser technologies in Uzbekistan will contribute to industrial development, the creation of new jobs, and an increase in demand for intellectual labor. This will have a positive impact on the socio-economic development of the country.

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