Volume 02 • Edition May-June 2024

Illuminating Pathways in the World of Lasers

LASERMAN INDIA

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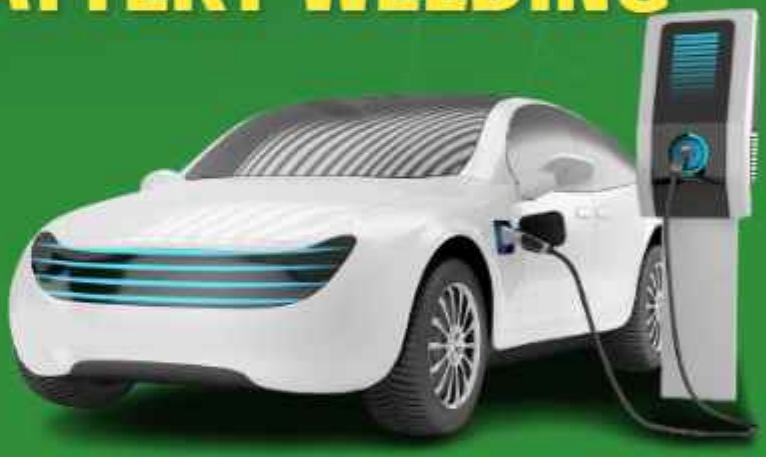

Thank you all for Loving & Support of our First Edition

Special Coverage

ANTIDUMPING MEASURES CAN HAVE A SIGNIFICANT IMPACT ON THE INDUSTRY SCENARIO OF ANY COUNTRY, INCLUDING INDIA.

Pg. No. 3

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Dear Readers,

Last month marked a historic moment for us at Laserman India as we launched our inaugural edition. The outpouring of support, curiosity, and enthusiasm from you our readers has been overwhelming and deeply gratifying. As we navigated through the maiden journey of our magazine, your engagement and feedback have been the wind beneath our wings, propelling us forward into this second edition with renewed vigor and purpose.

In April, we embarked on a mission to shine a light on the laser industry's brightest ideas, innovations, and individuals. Our cover story on Antidumping and its potential to reshape the industry landscape in India sparked conversations and debates, illustrating the critical intersection of policy and technology. Features like "The ABCs of Lasers: From Basics to Breakthroughs" and "Precision in Practice" were crafted to both educate and inspire, bridging gaps between complex technical knowledge and practical applications.

The success of our first edition measured not just in numbers, but in the vibrant discussions it ignited across forums, social media, and industry gatherings has set a high bar. But it is a challenge we embrace with enthusiasm as we continue to evolve, aiming to delve even deeper into the subjects that matter most to our community.

This month, our section, "The Laser Craftsmen: Illuminating the Path Forward," promises to offer an insider's perspective on the ingenuity and dedication driving laser manufacturers. Coupled with features like "Rocket Singh: Tales from the Laser Sales Front", The Unsung Heroes: Guardians of Laser Technology (first time ever we are covering service engineers on the front) and "Laser Legacy: End-User Experiences Unfolded," we're broadening our lens to capture the full spectrum of the laser industry from creation to consumption, from ideation to implementation.

As Laserman India grows, so too does our commitment to being your premier source for all things laser technology. Whether you're in academia, the industry, or simply a laser enthusiast, we strive to bring you content that enlightens, informs, and inspires.

We invite you to dive into the pages of our May 2024 edition with the same zeal and curiosity that you showed our first. Your insights, stories, and feedback are what shape us, and we eagerly anticipate continuing this journey together, exploring the boundless potential of laser technology.

Together, let's illuminate the future—one laser beam at a time.

Warm regards,
Prof.(Dr.) N. Kumar Swamy
M.Sc., M.Phil., M.Tech., Ph.D.
Editor-in-Chief
Laserman India

Editorial Member

Dr. B P Bhol
Identify and curate content, reviewers ensure quality and accuracy, while approvers make final decisions, ensuring alignment with editorial standards in the magazine's publication process.

Mr. Nagendra Rawat
Collaborators work with writers, designers, photographers, and other contributors to develop compelling content, providing feedback, guidance, and support to ensure that each piece meets the magazine's standards and objectives while fostering a sense of teamwork and creativity.

Dr. Poonam Verma
Strategic planner analyzes market trends, identifies opportunities, and formulates long-term goals and objectives to guide the magazine's growth and success, ensuring alignment with its mission and audience needs.

Mr. Vipin Gupta
Editorial guidelines serve to maintain the integrity, consistency, and quality of content in a publication, providing a framework for writers and editors to adhere to ethical standards and audience expectations while ensuring accuracy and clarity.

Ms. Khushboo Gupta
Responsible for curating articles, features, and other material that align with the publication's editorial vision, target audience, and quality standards. They play a pivotal role in shaping the magazine's content strategy, ensuring relevance, diversity, and engagement while maintaining the publication's editorial integrity and identity.

Mr. Dipesh Nishad
Designs layouts and illustrations to visually enhance the publication and maintain brand consistency.

Antidumping Measures Can Have A Significant Impact On The Industry Scenario of Any Country, Including India

Protection of Domestic Industry

Antidumping measures are intended to protect domestic industries from unfair competition by foreign companies that sell their products at prices below fair market value. By imposing antidumping duties on these products, the Indian government can protect local industries from being undercut by cheap imports.

Market Stability

Antidumping measures can help maintain stability in domestic markets by preventing sudden surges of imported goods flooding the market at unfairly low prices. This stability can be crucial for the growth and sustainability of domestic industries.

Competitive Advantage

Antidumping measures can help Indian companies compete more effectively in the domestic market against foreign competitors. By leveling the playing field, domestic companies may find it easier to maintain or increase their market share, leading to growth and expansion opportunities.

Trade Relations

However, there can be a downside to antidumping measures. They can strain trade relations between India and the countries affected by these measures. Trade disputes may arise, leading to retaliatory actions from affected countries, which can negatively impact overall trade relations and potentially escalate into trade wars.

Consumer Impact

Antidumping measures may lead to higher prices for certain imported goods, which can affect consumers who rely on these products. This impact needs to be carefully considered, especially for goods that are essential or have limited domestic alternatives.

Anti-Dumping Tariff Imposed on Imported Industrial Laser Machines from China

To safeguard Indian manufacturing, the Indian government has enacted a robust Anti-Dumping legislation targeting the importation of laser machines from China. In line with this, the Finance Ministry has implemented a definitive anti-dumping duty on particular Chinese industrial laser machines utilized for cutting, marking, or welding tasks, effective from December 22, 2023. These duties, ranging from 24.66% to 147.2% of the Cost, Insurance, and Freight (CIF), are contingent upon the producer and are set to remain in place for a five-year duration.

Before delving into the complexities of the recently enacted anti-dumping law, let's first explore the practical applications of laser machines. These machines are extensively utilized across diverse industries, including electronics, automotive, medical, HVAC, and other specialized sectors, playing a pivotal role in streamlining processes and enhancing production efficiency. Particularly noteworthy is their contribution to lithium-ion battery and electric vehicle manufacturing, where they are employed for tasks like welding connectors to busbars and laser welding laminated electrical steel for electric vehicle production.

With this comprehension of the significance of laser machines in various industries, let's now scrutinize the specifics and ramifications of the newly introduced anti-dumping law.

Dumping

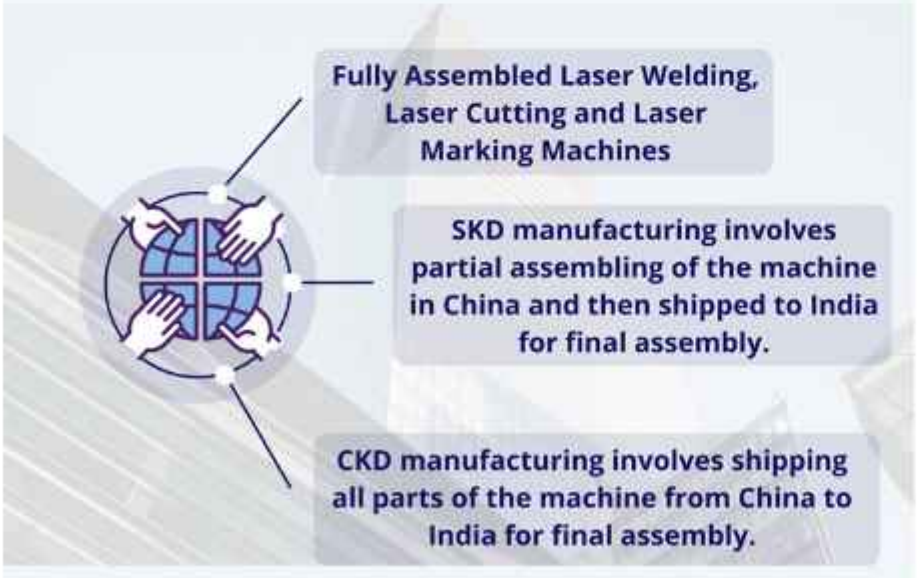
Dumping is the practice of selling goods in a foreign market at a price lower than the cost of production or below domestic market prices, potentially harming local industries.

Antidumping

Anti-dumping refers to measures taken by governments to counteract the practice of dumping, typically through imposing tariffs or duties on imported goods to protect domestic industries from unfair competition.

Laser Machine Varieties and Components Subject to Heightened Taxes and Duties

Three major components are heightened for responsible for Taxes and Duties.



Advantages for the Indian Manufacturing Sector from Anti-Dumping Measures

The implementation of this Anti-dumping Law against laser machine imports from China is poised to deliver significant advantages to India's manufacturing sector. Essentially, it acts as a catalyst for fostering the growth of the domestic laser industry, aligning with the overarching objectives of the "Make-in-India" initiative and promoting indigenous manufacturing capabilities.

Benefit in the Indian Market

Advantages for the Indian Manufacturing Sector from Anti-Dumping Measures

1 Safeguarding Indian Manufacturers

Through imposing substantial taxes Chinese laser machines, the Indian government aims not only to ensure uitable competition but also to foster he expansion of Indian manufacturers. is strategy empowers them to provide competitive pricing while upholding quality standards, thus stimulating growth within the domestic industry.

2. Promoting Technical Advancement

By restricting laser machine imports, the government is encouraging local manufacturers to enhance their technological self -sufficiency. This legislation incentivizes Indian enterprises to allocate resources towards research and development, thus advancing their manufacturing capabilities and product standards. Ultimately, this transition will spur innovation, bolster the indigenous laser machine industry, and elevate India's technological competence on a broader scale.

3 Boosting Employment Opportunities

By safeguarding the interests of local manufacturers, the anti-dumping legislation will invigorate yob creation in India As indigenous businesses thrive and grow, they will generate employment opportunities spanning diverse Skill levels, thereby bolstering the nation's socio-economic progress. Furthermore, heightened domestic production will aid in diminishing dependency on foreign imports.

4. Collaboration & Partnership

By safeguarding the interests of local manufacturers, the anti-dumping legislation will invigorate yob creation in India As indigenous businesses thrive and grow, they will generate employment opportunities spanning diverse Skill levels, thereby bolstering the nation's socio-economic progress. Furthermore, heightened domestic production will aid in diminishing dependency on foreign imports.

CBIC imposes anti-dumping duty on imports of Industrial Laser Machinery originating in or exported from China. Under section 9A of the Customs Tariff Act, the Central Government imposes anti-dumping duties on specified goods. These duties vary for different producers, ranging from 22.54% to 147.20% of the CIF value. The affected goods comprise Industrial Laser Machines, whether fully assembled, in SKD, or CKD form, utilized for cutting, marking, or welding tasks. This encompasses Laser Cutting Machines, Laser Marking Machines, and Laser Welding Machines. Duty rates apply to goods originating in China and exported from China, with distinct rates for various producers. The duty will remain effective for five years from the date of publication, payable in Indian currency.

"The laser industry is a prime example of how scientific breakthroughs can lead to practical and widespread applications."

Imposition of Anti-dumping Duties (ADD)

Affects a range of machines used for cutting, marking or welding operations coming in fully assembled, semi-knocked down (SKD) or completely knocked down (CKD) form

Variability in Duty Rates

The duty rates imposed vary widely across different producers, ranging from 0% for certain products from TRUMPF (China) Co., Ltd. to as high as 147.20% for machines from any producer not specifically listed (SN 9) and for any imports of the specified machines from any country other than China but exported through China (SN 10). This variability indicates a targeted approach, focusing on specific companies and trade practices deemed unfair.

Specific Producers Mentioned

The table lists specific Chinese producers such as GD Han's Yueming Laser Group Co., Ltd., Jiangsu Yawei Machine-Tool Co., Ltd., HSG Laser Co., Ltd., among others, with duties ranging from 22.54% to 90.49% for different companies. This detailed listing implies a comprehensive investigation into the practices of individual manufacturers.

Impact on Different Types of Imports

The duties apply to a wide range of industrial laser machines under several tariff items (84561100, 84569090, 84798199, 85152190, 85158090, and 90132000), impacting both fully assembled machines and those shipped in SKD or CKD form. This wide scope shows an effort to cover all possible means of importing these goods, addressing potential loopholes in trade practices.

Protective Measure for Domestic Industry

The imposition of these duties can be seen as a protective measure aimed at safeguarding the domestic industry from what is perceived as unfair competition due to dumping. Dumping refers to exporting goods at prices lower than the home market or below the cost of production, potentially harming the importing country's domestic industry.

Aimed at Encouraging Fair Trade

By imposing varying rates of ADD, India aims to encourage fair trade practices and ensure that imported goods are priced in a manner that does not harm the domestic industry. It's a move towards creating a level playing field for domestic producers of similar goods.

Potential Impact on Market Dynamics

The imposition of these duties may lead to increased prices for imported laser machines in India, potentially reducing their market share and providing an opportunity for local manufacturers to capture a larger portion of the market. It could encourage investment in domestic manufacturing capabilities and technology development.

Broader Implications

This measure may have broader implications for India-China trade relations and could prompt discussions on trade practices and regulations. It reflects an ongoing global discourse on trade imbalances, protectionism, and the need for mechanisms to address perceived unfair practices.

Overall, this action by India's Directorate General of Trade Remedies (DGTR) reflects a strategic approach to trade defense, aiming to protect domestic industries from unfair international competition while encouraging fair trade practices and fostering domestic manufacturing growth.

Regarding the matter of 'Industrial Laser Machines used for cutting, marking, or welding' (hereinafter referred to as the subject goods), falling under tariff items 84561100, 84569090, 84798199, 85152190, 85158090, and 90132000 of the First Schedule to the Customs Tariff Act, 1975 (51 of 1975) (hereinafter referred to as the Customs Tariff Act), originating in or exported from China PR (hereinafter referred to as the subject country) and imported into India, the designated authority, in its final findings issued vide notification 06/07/2022-DGTR, dated the 27th September 2023, published in the Gazette of India, Extraordinary, Part I, Section 1, dated the 27th September 2023, read with the corrigendum issued vide notification 06/07/2022-DGTR dated 6th December 2023, published in the Gazette of India, Extraordinary, Part I, Section 1, dated the 7th December 2023, has, among other things, concluded that: (i) the subject goods have been exported to India from the subject country at dumped prices; (ii) the domestic industry has suffered material injury due to subject imports from the subject country; (iii) the material injury has been caused by the dumped imports of subject goods from the subject country.

The designated authority has recommended the imposition of an anti-dumping duty on imports of subject goods originating in or exported from the subject country and imported into India, with the aim of alleviating injury to the domestic industry.

The ABCs of Lasers From Basics to Breakthroughs

The ABCs of Lasers: From Basics to Breakthroughs" is a fantastic way to explore the fascinating world of lasers! Here's a structured overview to help you understand the essentials and latest advancements in laser technology.

A

Basics of Lasers

Definition

laser (Light Amplification by Stimulated Emission of Radiation) is a device that emits a focused beam of light through a process of optical amplification based on the stimulated emission of electromagnetic radiation.

How Lasers Work

Stimulated Emission: Electrons in an atom or molecule are excited to a higher energy level and then fall back to a lower level, releasing a photon of light.

Amplification: The emitted photons stimulate other excited electrons to emit more photons, leading to a cascade effect.

Emission: The light is emitted in a coherent, monochromatic beam through an optical cavity (usually with mirrors) that amplifies the light.

Key Components

Gain Medium: The material (gas, liquid, solid, or semiconductor) where stimulated emission occurs.

Pumping Source: Energy source used to excite the gain medium (e.g., electrical current, another light source).

Optical Cavity: Mirrors that reflect light back and forth through the gain medium, amplifying it.

Properties of Laser Light

Coherence: The light waves are in phase, leading to a narrow beam with minimal spread.

Monochromaticity: Lasers emit light of a single wavelength or color.

Directionality: Lasers produce a very collimated beam with minimal divergence.

B

Applications of Lasers

1 Communications

Fiber Optics: Lasers transmit data over long distances through optical fibers, enabling high-speed internet and telecommunication.

2 Medicine

Surgery: Precision laser surgery for cutting or vaporizing tissues.

Diagnostics: Laser technologies like OCT (Optical Coherence Tomography) for imaging.

3 Manufacturing

Cutting and Welding: Lasers are used for precise cutting, welding, and material processing.

4 Entertainment

Laser Shows: Light displays and effects in concerts and events.

Laser Pointers: For presentations and pointers.

5 Science and Research

Spectroscopy: Analyzing materials by their interaction with laser light.

Microscopy: Techniques like confocal microscopy for high-resolution imaging.

C

Breakthroughs and Future Directions

Quantum Dots

Nanometer-sized semiconductor particles that can be used in lasers for more precise and efficient devices.

Laser Cooling

Techniques like laser cooling to achieve near absolute zero temperatures, useful in quantum computing and precision measurement.

Femtosecond Lasers

Extremely short pulses that enable ultra-fast processes and new imaging techniques.

High-Energy Lasers

Development of high-power lasers for applications in defense, space propulsion, and material science.

Integrated Photonics

Integration of lasers with other optical components on a single chip, enabling advances in computing and telecommunications.

Exploring lasers from these fundamental concepts to the cutting-edge developments can provide a comprehensive understanding of their role in modern technology and future innovations. Exploring the evolution of laser technology from before and after 2020 reveals significant advancements and breakthroughs.

Before 2020: The focus was on solidifying fundamental technologies, expanding applications, and improving efficiency and precision in various domains.

After 2020: Emphasis shifted towards pushing the boundaries of laser technology with ultra-fast and high-energy systems, integrating lasers with other technologies, and exploring new frontiers in quantum and medical sciences.

These advancements reflect the dynamic nature of laser technology and its expanding role in various scientific, industrial, and everyday applications.

Before 2020: Foundation and Growth

Fundamentals Established:

Introduction and Early Developments: The concept of lasers emerged in the early 1960s with the invention of the first laser by Theodore Maiman. Basic principles and components like gain mediums, optical cavities, and pumping sources were well established.

Diverse Applications: By the 1990s and 2000s, lasers had found applications in fields such as telecommunications (fiber optics), medicine (laser surgery and diagnostics), manufacturing (cutting and welding), and entertainment (laser shows).

Technological Advancements:

Semiconductor Lasers: Development of diode lasers led to more compact and efficient devices, revolutionizing consumer electronics and telecommunications.

Femtosecond Lasers: Pulses of light lasting just femtoseconds (10^-15 seconds) enabled precise material processing and advanced imaging techniques.

Laser Cooling and Trapping: Techniques for cooling and trapping atoms using lasers allowed for advancements in quantum physics and atomic research.

Medical and Scientific Milestones:

Laser Surgery: The use of lasers for eye surgery (e.g., LASIK) and other precise medical procedures became widespread.

Spectroscopy and Microscopy: Advances in laser spectroscopy and confocal microscopy enhanced material analysis and biological imaging.

After 2020: Breakthroughs and Innovations

Advanced Materials and Techniques:

Quantum Dots and Nanotechnology: Quantum dot lasers, utilizing nanoscale semiconductor particles, have emerged, offering tunable wavelengths and enhanced efficiency.

Metamaterials: Development of laser technologies utilizing metamaterials (materials with unique properties not found in nature) for new optical applications.

High-Energy and Ultra-Fast Lasers:

High-Energy Laser Systems: Significant progress in high-energy lasers for defense applications and research in fusion energy, such as the National Ignition Facility achieving milestones in inertial confinement fusion.

Attosecond Lasers: Lasers generating pulses on the attosecond (10^-18 seconds) timescale allow scientists to study electron dynamics in real-time.

Integration and Miniaturization:

Integrated Photonics: Advances in integrating lasers with other optical components on a single chip have led to more compact, efficient, and versatile photonic devices.

On-Chip Lasers: Development of tiny lasers integrated into semiconductor chips for applications in telecommunications, sensors, and on-chip communication.

Healthcare Innovations:

Precision Medicine: Enhanced laser technologies in medical diagnostics, including advanced imaging techniques and targeted therapies.

Non-invasive Procedures: Progress in laser-based non-invasive treatments and diagnostics, improving patient outcomes and expanding applications.

Quantum and Computing Applications:

Quantum Computing: Lasers are used in quantum computing research for manipulating qubits and improving quantum communication systems.

Laser-based Communication: Advancements in free-space optical communication systems using lasers for high-speed, long-distance data transmission.

Before 2020

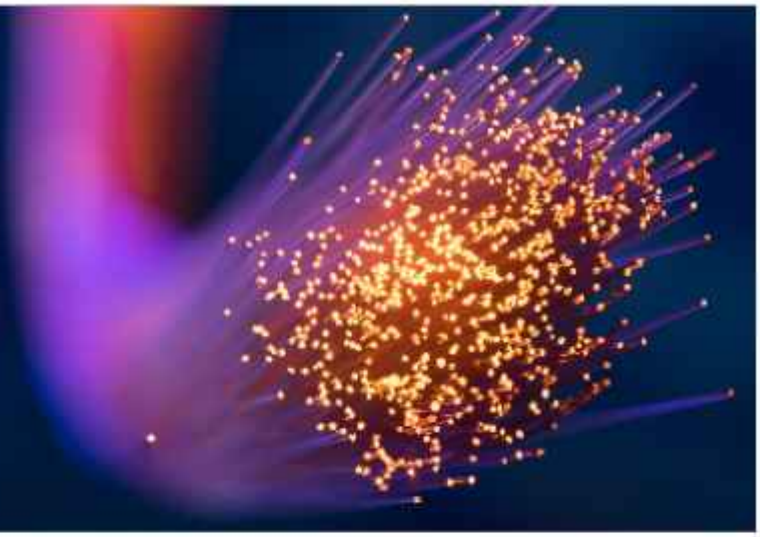
1960s: Invention of the laser
1980s: Introduction of semiconductor lasers
1990s: Development of femtosecond lasers
2000s: Advances in laser cooling and trapping, laser surgery applications

After 2020

2020s: Quantum dot lasers, high-energy laser systems
2021: Attosecond lasers for electron dynamics
2022: Integrated photonics and on-chip lasers
2023: Advances in laser-based quantum computing and non-invasive medical procedures

The Unsung Heroes Guardians of Laser Technology

India has made significant contributions to the field of lasers and photonics, with numerous scientists and innovators playing pivotal roles in advancing this technology.



Mani Lal Bhaumik

An Indian-born physicist who co-invented the laser technology used in Lasik eye surgery. He made significant contributions to the field of quantum physics and lasers. In 1961, Dr. Bhaumik started working on laser research at Xerox Electro-Optical Systems. After seven years, he joined the Northrop Corporate Research Laboratory, where he led a team that developed the world's first efficient excimer laser, which is now commonly used in precise machining and non-damaging biological tissue cutting, forming the basis for Lasik eye surgery.

Nicolay Basov and Aleksandr Prokhorov

In the Soviet Union, Basov and Prokhorov independently developed the principles of the maser (the microwave version of the laser) and later contributed to the development of the laser. They shared the Nobel Prize in Physics in 1964 with Townes for their work in quantum electronics, which included contributions to laser technology.

Gordon Gould

Gould is often credited with the concept of the optical laser and coined the term "laser" (originally an acronym for Light Amplification by Stimulated Emission of Radiation). Gould was involved in a lengthy legal battle over patents related to laser technology, claiming that he had independently developed the laser before Townes and Schawlow.

Charles H. Townes and Arthur L. Schawlow

These physicists are credited with the concept of the laser. In 1958, they published a paper outlining the principles of the laser and how it could be realized. Townes and Schawlow also laid the groundwork for understanding the principles of stimulated emission necessary for laser operation.

"From barcode scanners to laser printers, the impact of lasers on daily life is profound yet often invisible."

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Precision in Practice The World of Laser Cutting Machines

Laser cutting machines are pivotal tools in modern manufacturing and design, offering unparalleled precision and versatility. They use a high-powered laser beam to cut or engrave materials, making them essential in industries ranging from automotive to jewelry. Here's a detailed look into the world of laser cutting machines:

Fundamentals of Laser Cutting

1.1 Principle of Operation : Laser cutting involves focusing a laser beam onto a material, causing it to melt, burn, vaporize, or be blown away by a jet of gas. The laser's high energy density allows for precise cuts and intricate designs. The main types of lasers used include CO2, fiber, and Nd lasers, each with distinct characteristics suitable for different materials and applications.

Key Components

Laser Source: Generates the laser beam.
Beam Delivery System: Guides the beam to the cutting head.
Cutting Head: Includes lenses to focus the beam and often a nozzle for gas assistance.
Worktable: Where the material is placed and moved for cutting.

Types of Laser Cutting Machines

CO2 Laser Cutters Commonly used for non-metallic materials like wood, acrylic, glass, and some plastics. They are also capable of cutting thin metals. CO2 lasers are appreciated for their high quality and precision.

Fiber Laser Cutters These are more efficient for cutting metals such as stainless steel, aluminum, brass, and copper. They offer faster cutting speeds and require less maintenance than CO2 lasers, making them ideal for industrial applications.

Nd Lasers Used primarily for engraving and applications requiring high peak power, such as in the medical device industry. They can cut both metals and non-metals but are less common due to their specialized nature.

Applications of Laser Cutting

Industrial Manufacturing Laser cutting is widely used in the automotive, aerospace, and electronics industries for creating complex components and parts with high precision.

Art and Design Artists and designers use laser cutters to create intricate patterns, engravings, and sculptures in various materials, including metals, plastics, and wood.

Prototyping and Custom Fabrication The ability to quickly and accurately cut materials makes laser cutting ideal for prototyping and creating custom parts.

Advantages of Laser Cutting

Precision and Accuracy
Laser cutting offers unmatched precision, capable of cutting complex shapes with tight tolerances.

Versatility
It can process a wide range of materials, including metals, plastics, wood, and textiles.

Speed and Efficiency
Laser cutting is faster than traditional cutting methods, reducing production time.

Minimal Waste
The high precision of laser cutting results in less material waste, making it a more cost effective and environmentally friendly option.

Challenges and Considerations

Material Limitations

Not all materials are suitable for laser cutting. Reflective metals, for example, can damage the machine if not properly handled.

Maintenance and Safety

Laser cutters require regular maintenance to ensure optimal performance. Safety is also a concern due to the high energy levels and potential for hazardous fumes.

Cost

The initial investment and operational costs for laser cutting machines can be high, especially for high-powered industrial models.

Future Trends

Technological Advancements
Developments in laser technology continue to push the boundaries of what laser cutting machines can achieve, such as cutting thicker materials and achieving finer resolutions.

Automation and Integration The integration of laser cutting machines with other manufacturing processes and automation systems is increasing, leading to more efficient and flexible production lines.

Eco-Friendly Innovations
There is a growing focus on developing more energy-efficient lasers and reducing the environmental impact of laser cutting processes.

Conclusion

Laser cutting machines are revolutionizing various industries with their precision, versatility, and efficiency. As technology advances, these machines will likely become even more integral to manufacturing, design, and beyond. Whether for industrial use, artistic endeavors, or prototyping, laser cutting offers a powerful tool for transforming ideas into reality. This comprehensive overview covers the basics and advanced aspects of laser cutting machines, highlighting their importance and potential in the modern world.

> **"The laser is a key technology in modern manufacturing, enabling more precise cuts, improved quality, and reduced waste."**

Laser Alchemists: Transforming Ideas into Reality

In the realm of Laser Alchemists, the boundaries between imagination and reality dissolve in the radiant glow of innovation. We are artisans of light, forging new frontiers where ideas are the raw materials and lasers are the catalysts for transformation. laser processing in art and design has opened new expression possibilities to create artworks and unique pieces. Laser technology stands out for its accuracy, speed and extreme versatility precious qualities for artists and craftsmen that want to give birth to innovative creations. Laser marking and engraving become the right tools to obtain unique decorative effects and create artifacts and

prestigious installations. The never-ending expressive potentialities join the advantage of an environmentally sustainable technology, free of polluting products and without any waste of materials. Therefore, the union of art and laser is the new frontier of a thousand-year-old journey where a state-of-the-art technology interprets new requirements and values. A rediscovery of uniqueness and of the desire for customization combined with the need for immediateness and a new environmental awareness.

At Laser Alchemists, it specialize in harnessing the potential of laser technology to breathe life into concepts and dreams. Much like the alchemists of old who sought to transmute base metals into gold, we seek to transfigure ideas into tangible realities. Our craft is built upon a foundation of cutting-edge laser technologies, paired with boundless creativity and expertise.

Laser Engraving and Etching

We carve intricate designs and patterns onto various materials, turning ordinary objects into personalized works of art. Whether it's custom signage, promotional items, or gifts, our laser engraving services add a touch of sophistication and individuality.

Prototyping and Manufacturing: Transform your designs into prototypes with precision and speed using our laser cutting and 3D printing capabilities. From concept sketches to functional models, we empower creators to iterate and refine their ideas effectively. For the last two decades, since the conception of the rapid prototype concept, several medium- to small-scale industries worldwide have implemented various new techniques of rapid manufacturing and tooling to keep up their production and meet customer demand. Both optics and laser technology have played a vital role in the development of new innovative techniques for manufacturing technology. To achieve

better quality and high productivity of the end product, many of the rapid prototype (RP) systems are based on techniques that require specialized optics and laser systems. Besides that, the futuristic trend of RP in microtechnology may extend its utility in the direct fabrication of micro-optical components such as microlens, mirror arrays etc., for its various applications in micro-optical electromechanical systems (MOEMS). With the established technique of photopolymerization for making plastic mold, the technique has now been extended to metallic parts. However, due to limitations in processing techniques and materials, their application is still limited to a few products. But there seems to be significant potential of the new techniques for medical and industrial applications. The traditional RP systems, such as stereolithography (SL), selective laser sintering (SLS), fused deposition modeling (FDM), and ballistic particles manufacturing processes continue to meet the demand of most of the rapid prototyping (RPT) jobs.

Artistic Installations

Immerse yourself in the magic of light and space with our bespoke artistic installations. Our team collaborates with artists and designers to realize large-scale laser-based artworks that captivate and inspire.

Consulting and Collaboration

We thrive on collaboration and are eager to partner with individuals and businesses to explore innovative applications of laser technology. Our consulting services offer tailored solutions for your creative projects.

Why Choose Us?

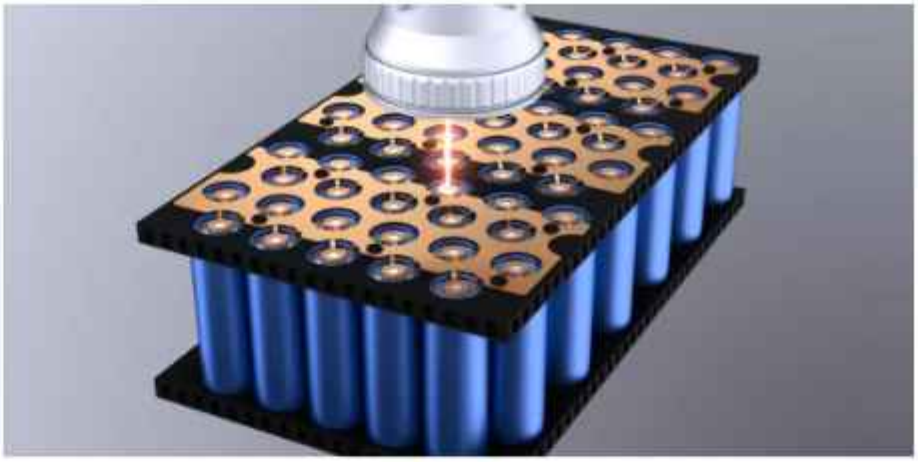
Expertise: Our team comprises skilled artisans and engineers who are passionate about pushing the boundaries of what's possible with lasers.

Innovation: We stay at the forefront of technological advancements, continuously exploring new techniques and materials to expand creative horizons.

Quality and Precision: Every project we undertake is executed with meticulous attention to detail, ensuring exceptional quality and precision in our work.

Laser Battery Welding: Future for EV market

Battery welding, often referred to specifically as spot welding or resistance welding, is a critical process in the assembly of battery packs, particularly for rechargeable batteries used in a wide array of products from electric vehicles to portable electronic devices. This process involves joining metal components (usually nickel strips) to the battery cells' terminals (anode and cathode) to create a reliable electrical connection that can handle the high current demands of the battery pack.



Key Techniques and Considerations

Spot Welding

This is the most common method used for battery welding. It involves applying pressure and heat to the metal parts to be joined using an electric current. The resistance of the metals to the electric current generates heat, causing the metals to melt and fuse together at specific points, creating a durable bond without overheating the battery cells.

Ultrasonic Welding

Another technique used, especially for sensitive components. It involves using high-frequency ultrasonic acoustic vibrations to create a solid-state weld. It's advantageous for its low temperature process, which is less likely to damage sensitive battery components.

Laser Welding

A precise and efficient method, laser welding uses a laser beam to melt and fuse materials together. It's known for its high speed, accuracy, and ability to join thin or delicate materials with minimal heat damage to surrounding areas.

Considerations

Electrical Resistance:
The welding process must ensure low electrical resistance at the weld joints to minimize energy loss during battery operation.

Durability:
Welds must be strong enough to withstand the physical and thermal stresses experienced during battery usage.

Precision:
Accurate placement and quality of welds are crucial to ensure the safety and efficiency of the battery pack.

Material Compatibility:
The welding process must be suitable for the specific materials used in battery terminals and connectors, typically involving various alloys of nickel and copper.

Safety:
Given the high energy density of modern rechargeable batteries, there's a significant emphasis on ensuring that the welding process does not compromise the integrity of the battery cells, which could lead to short circuits, overheating, or even thermal runaway.

Applications

Battery welding is essential across various industries, particularly where high-performance battery packs are required, including:

- **Electric Vehicles (EVs)**
For assembling the large and complex battery packs needed to power electric cars.
- **Consumer Electronics**
In devices such as smartphones, laptops, and tablets, where compact and reliable battery packs are crucial.
- **Renewable Energy Systems**
In storage solutions for solar panels and wind turbines, where batteries store and release electrical energy efficiently.

Ensuring the quality of battery welds is vital for the performance, longevity, and safety of the battery pack, highlighting the importance of choosing the right welding technique and equipment for each specific application.

Laser battery welding is a sophisticated method employed for joining components within battery assemblies, such as connecting tabs to cells or welding the case of the battery itself. This technique is particularly valuable in the production of batteries for electric vehicles (EVs), consumer electronics, and renewable energy storage systems due to its precision, reliability, and the quality of the welds it produces. Here's a closer look at laser welding in the context of battery manufacturing:

How Laser Battery Welding Works?

Laser welding uses a highly focused laser beam to melt and fuse materials together. The process can be categorized into two main types:

Conduction Limited Welding:

Where the laser heats the surface of the material, and the heat is conducted downwards to create the weld. This method is suitable for welding thin materials and requires less laser power.

Keyhole Welding

In this method, the laser power is high enough to vaporize the material, creating a keyhole of vapor that allows the laser to penetrate deeper into the material. As the laser moves along the weld path, the material cools and solidifies, forming a deep, narrow weld. This is particularly useful for thicker materials or when a strong weld is required.

Challenges and Considerations

While laser welding offers many advantages, there are challenges to consider, such as the initial cost of laser welding equipment and the need for specialized expertise to optimize welding parameters for different materials and thicknesses. Additionally, reflective materials like copper can pose difficulties due to their high reflectivity to laser light, requiring specific laser types (such as green lasers) or pre-treatment of the material to improve absorption.

In summary, laser battery welding is a critical technology in the production of high-performance and reliable battery packs, offering unmatched precision and efficiency vital for meeting the growing demands of the electric mobility, consumer electronics, and renewable energy sectors.

Advantages of Laser Welding for Batteries

Precision and Control
Laser welding allows for highly precise control over the weld location, depth, and amount of energy delivered, making it ideal for the small and sensitive components found in battery assemblies.

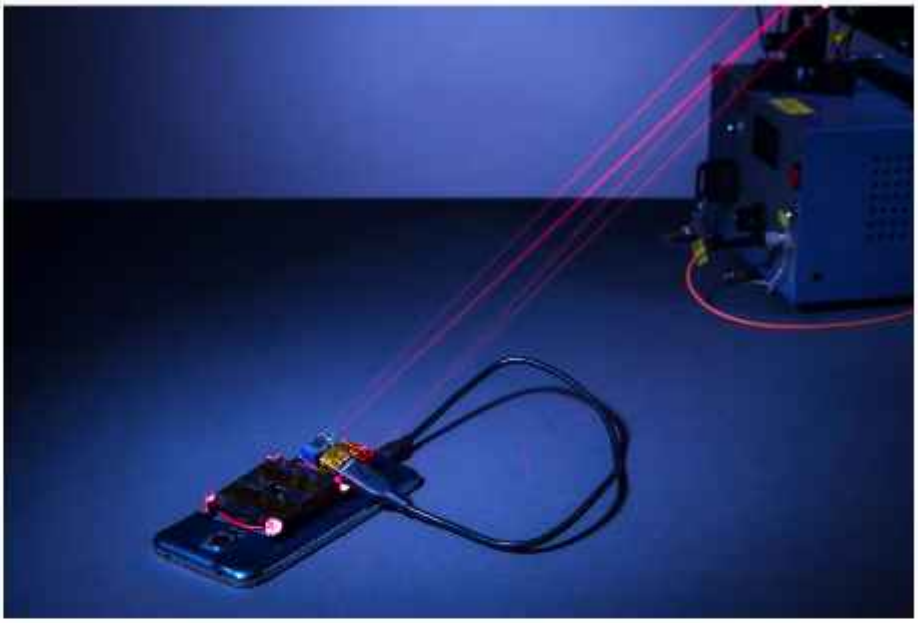
High-Speed and Efficiency
The process is fast and can be easily automated, making it highly efficient for mass production.

Low Thermal Impact
Laser welding minimizes the heat affected zone (HAZ), reducing the risk of damaging sensitive battery components or affecting the battery's performance.

Versatility
It is suitable for welding a wide range of materials, including those commonly used in battery production like copper, aluminum, and nickel.

Quality and Reliability
Produces high-quality, consistent welds that are critical for the performance and safety of battery packs.

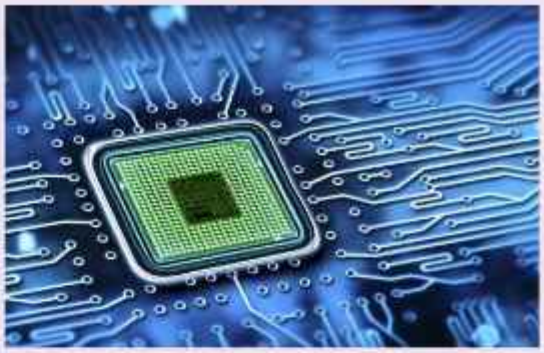
The increasing battery recharge intervals for smartphones pose a challenge due to their growing power consumption from advanced multimedia signal processing. A promising solution is wireless charging, which can recharge batteries over the air. Motivated by this, we explore the fundamental physics and system structure of a promising wireless charging technique called distributed laser charging (DLC). With DLC's unique capabilities, we could transmit approximately 2 watts of power over a distance of about 10 meters. After comparing three major wireless charging methods—inductive coupling, magnetic resonance coupling, and microwave radiation—researcher will highlight the advantages of DLC for mobile applications. Also propose two wireless charging network architectures: a DLC-supported infrastructure-based network and a DLC-based ad-hoc network. These architectures demonstrate DLC's potential to achieve the ideal of keeping any device fully charged, anytime and anywhere. We also show how the maximum power



transmission efficiency varies based on the transmitter's supply power, laser wavelength, transmission distance, and PV-cell temperature. Just as maximizing information transmission capacity is crucial in wireless information transfer (WIT), optimizing power transmission efficiency is equally vital in wireless power transfer (WPT). Consequently, this work not only elucidates the theoretical aspects of DLC but also provides practical guidelines for designing DLC systems.

Breaking New Ground: Advancements in Semiconductor Design for Sensing Beyond Visible Light

Semiconductor design is on the brink of a revolutionary shift as researchers delve into the realm beyond visible light for sensing applications. Recent strides in semiconductor technology have propelled the development of sensors capable of detecting wavelengths beyond what the human eye can perceive. These pioneering advancements promise to unlock a multitude of possibilities in fields such as astronomy, environmental monitoring, healthcare, and security. By harnessing semiconductors to sense infrared, ultraviolet, and other non-visible wavelengths, scientists are poised to unveil a new era of innovation. With applications ranging from night vision cameras to biomedical imaging devices, the impact of these breakthroughs is poised to transcend conventional boundaries, shaping the future of sensing technology.



Surpassing the Constraints of Silicon

Innovation in semiconductor technology is transcending the limitations of silicon, paving the way for unprecedented advancements. Researchers are exploring novel materials and design approaches to push the boundaries of performance and functionality in electronic devices. This quest to surpass silicon's constraints promises to revolutionize various industries, from electronics to renewable energy and beyond, driving progress towards a more efficient and interconnected future.

Breaking Barriers: Advancing with Pinned Photodiode Structures

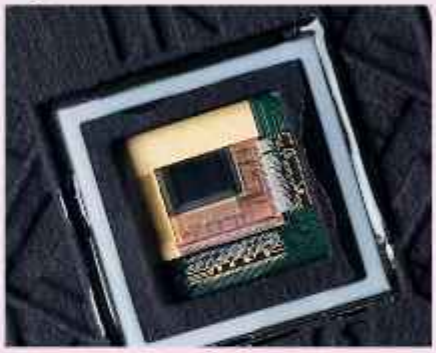
However, the integration of infrared (IR) sensors utilizing thin-film absorbers encounters hurdles, primarily due to low signal-to-noise ratios (SNRs), resulting in subpar image quality. Recent breakthroughs have addressed these challenges for the first time, not by altering material choices, but by leveraging the extensive history of pinned photodiode (PPD) structures in silicon-CMOS image sensors, dating back to the 1980s.The PPD structure, featuring an additional transistor gate and specialized photodetector configuration, significantly mitigates noise, establishing itself as a dominant technology in the consumer market for silicon-based image sensors. It facilitates transistor reset operations without kTC noise or residual frame effects, acting as a "super-switch" for complete charge drainage. Nevertheless, embedding a PPD within thin-film-based sensors has remained unattainable due to the complexity of integrating two distinct semiconductor systems.

Advancing Image Sensor Architecture

Advancements in image sensor architecture are catalyzing transformative changes in the realm of digital imaging. Recent breakthroughs are revolutionizing the way image sensors capture and process visual information, pushing the boundaries of performance and functionality. Innovations such as stacked sensor designs, backside illumination, and pixel-level processing are enhancing image quality, sensitivity, and speed. These developments not only cater to the growing demand for high-resolution imaging but also open doors to new applications in fields ranging from photography and videography to autonomous vehicles and augmented reality. As technology continues to evolve, the landscape of image sensor architecture is poised for further innovation, promising even greater strides in the realm of digital imaging.

Advancements in Linearity: Enhancing Precision

In subsequent studies, our team demonstrated that implementing the PPD pixel structure led to a notably more linear response, indicating enhanced accuracy in image reproduction. Additionally, stabilizing the photodiode bias effectively reduced dark current by 72% and improved linearity by 59% for organic thin-film photodiode-based image sensors. Incorporating a photogate further ensured a more precise portrayal of the captured scene, crucial for applications demanding faithful image reproduction.Moreover, the initial pixel design prioritized maximizing charge-to-voltage conversion gain, resulting in a constrained floating diffusion capacitance and limited full well capacity. However, a second-generation pixel structure successfully achieved a high full well capacity exceeding 1 Mega electrons, with a pitch of 5 µm. This enhancement guarantees a dynamic range of >100 dB, surpassing the 82 dB of the 3T pixel and showcasing the high signal-to-noise ratio (SNR) pixel's capability to capture a wide spectrum of light intensities, from dim to bright.



Expediting the Deployment of Thin-Film-Based Image Sensors

This pixel architecture presents possibilities for various promising thin-film photodiodes beyond organics, such as perovskite absorbers or quantum dots. As the photodiode is distinct from the readout circuit and integrated post-processing, the absorption materials used don't require stringent optimization before integration with the readout circuitry.The innovative 4T pixel design has the potential to expedite the deployment of monolithic thin-film-based image sensors. The advantages offered by our architecture could propel the development of novel applications that are either overlooked or inadequately addressed by silicon imagers.

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Advancing Optical Industry With Semiconductor Nanomaterials

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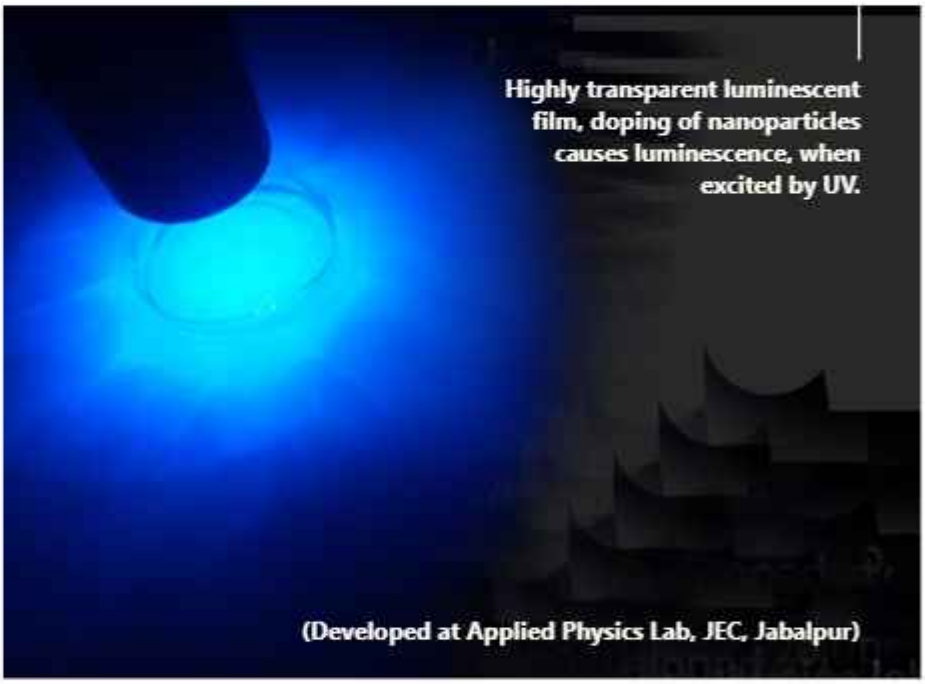
Semiconductor Nanomaterials: Need of Optical Industry

Semiconductor nanomaterials have attracted significant attention from the optical industry due to their size-dependent optical behavior. By tuning the energy gap of materials, efficient optical devices can be developed. PVA-ZnS composite films were prepared by a simple solvent casting method with improved optical performance. Strong host–filler interactions were confirmed by FTIR, UV–vis, and PL spectroscopy. The Photoluminescence (PL) data indeed showed a significant increase in the luminescent properties of the PVA-ZnS composites. Light transmittance was good. Highly transparent luminescent film was developed in research laboratory of Department of Applied Physics, Jabalpur Engineering College, Jabalpur Madhya Pradesh. By optimizing the doping of the nanoparticles, we achieve superior luminescence upon UV excitation. Thus by altering bandgap of semiconductor nanocrytals optically enhanced devices can be fabricated.



Highly transparent luminescent film, doping of nanoparticles causes luminescence, when excited by UV.

(Developed at Applied Physics Lab, JEC, Jabalpur)

A 16.10% efficiency organic solar module with ultra-narrow interconnections fabricated via nanosecond ultraviolet laser processing

Recent advancements have significantly improved the power conversion efficiency (PCE) and stability of organic solar cells (OSCs), broadening their potential applications in various fields. However, challenges in scaling up laboratory-scale cells to large-area modules remain a hindrance to commercialization. These challenges include achieving high-quality, large-area coating methods suitable for industrial applications and effectively interconnecting cells into modules while minimizing efficiency loss. Laser scribing, particularly with nanosecond UV lasers, offers a cost-effective and high-precision patterning technique for preparing OSC modules. By finely balancing sub-cell width and laser etching depth, researchers have achieved ultra-narrow dead areas and highly efficient OSC modules, demonstrating a certified efficiency of 15.43% for specified aperture areas. This study presents a promising approach for producing high-performance OSC modules with reduced dead area width, contributing to the advancement of solar cell technology.

This study presents a cost-effective laser patterning method for high-performance organic solar cell (OSC) modules, utilizing a 355-nm nanosecond pulse laser for efficient ITO, electron transport layer, and metal electrode removal. The approach achieves an ultra-narrow interconnection area width of 80 μm, enhancing module efficiency and resilience. Solar cells fabricated using this technique exhibit a high power conversion efficiency (PCE) of 17.55% for a 1.00-cm2 cell and 16.10% for an 11.08 cm2 module, with the highest reported PCE for OSC modules. Notably, the top-performing module achieves a remarkable geometric fill factor (GFF) of 98%, demonstrating significant potential for OSC commercialization.

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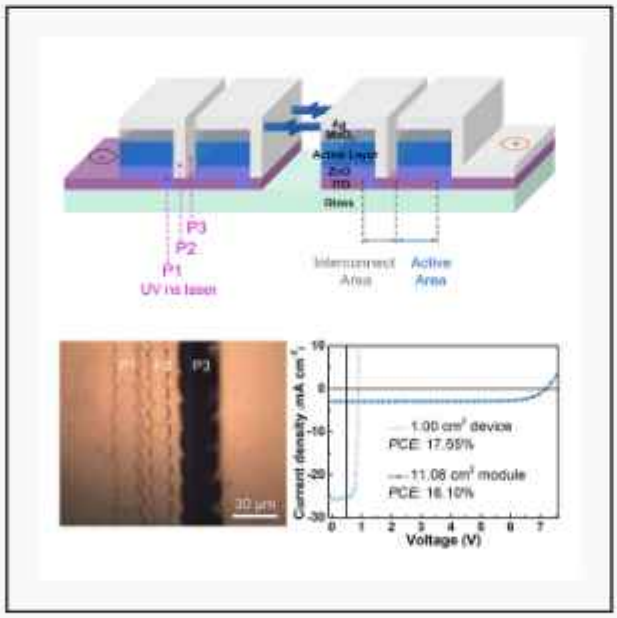
A 16.10% efficiency organic solar module with ultra-narrow interconnections fabricated via nanosecond ultraviolet laser processing



Implementing a precise scribing process is crucial for bridging the gap between lab-scale cells and large-area organic solar cell modules. Feng et al. report an efficient UV nanosecond laser patterning method for fabricating modules that significantly reduces interconnection width, offering a cost-effective solution for processing efficient modules.

Erming Feng, Chujun Zhang, Jianhui Chang, ..., Hin-Lap Yip, Liming Ding, Junliang Yang

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Highlights

Nanosecond laser is developed to process organic solar cell modules

An ultra-narrow interconnection width of 80 μm is achieved in modules

A certified efficiency of 15.43% is achieved for organic solar cells

Feng et al., Cell Reports Physical Science 5, 101883
March 20, 2024 © 2024 The Author(s).
https://doi.org/10.1016/j.xcrp.2024.101883

Whoa Elon Musk Tesla Manufacturing unit Maharashtra India : Electric Vehicle (EV)

Tesla, led by CEO Elon Musk, has been contemplating entering the Indian market for several years. India represents a significant potential market for electric vehicles due to government initiatives promoting clean energy and the country's large population. Maharashtra, one of India's most industrialized states and home to the city of Mumbai, was reportedly a preferred location for Tesla's manufacturing facility. The state government had been in discussions with Tesla representatives regarding potential investment and site selection.

American electric vehicle major Tesla is expected to send a team to India this month for scouting a potential location for its proposed facility says a report by Financial Times.The report states that the EV maker is looking at a proposed site in Gujarat, Maharashtra and Tamil Nadu, which will act as its potential manufacturing hub in the region.The company is expected to invest around $2-3 billion (Rs 16,662 crore to Rs 25,000 crore) towards the facility. Furthermore, this proposed facility will also play a crucial role in Tesla's plans to roll-out a sub-$30,000 (Rs 25 lakh) EV for not only the domestic but also export markets.The timing of the proposed announcement comes at a time when India gears up for the General Elections, and if things materialise would play in the favour of Prime Minister NarendraModi's push for the Make in India initiative.

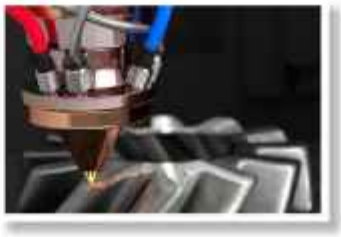
This would also mark the second such new major investment in the country after Vietnam's VinFast Group broke ground for its $500 million (Rs 4,165 crore) facility in Tamil Nadu in February 2024.This is not the first time Tesla has sent its team to India, and in fact, the EV maker has been flirting with the idea of manufacturing EVs in the country for several years.It was way back in 2015, Prime Minister Narendra Modi had visited Tesla's factory and met Elon Musk amidst his 5-day official visit to the United States of America.

Impact of EV in indian market

Tesla's entry into India could have a significant impact on the electric vehicle market in the country. It might not only increase consumer awareness and adoption of EVs but also stimulate competition and innovation in the automotive sector.Tesla's presence in India could also spur investments in charging infrastructure and renewable energy technologies, aligning with the Indian government's clean energy goals.

INDUSTRY INSIGHTS

Accelerating Laser Tech from Factory to Field




Accelerating laser technology from factory to field involves several key insights and considerations. Laser technology has evolved significantly over the years, finding applications in diverse industries including manufacturing, healthcare, defense, and communications.

1 Innovations in Manufacturing

Advanced Laser Systems: The journey begins with cutting-edge laser systems developed in manufacturing hubs. Innovations like fiber lasers, diode lasers, and ultrafast lasers are transforming precision engineering and material processing.

Automation Integration: Laser systems are being integrated with advanced robotics and automation, reducing human intervention and enabling continuous production cycles.

2 Material Science Breakthroughs

Materials Research: Research into new materials that respond better to laser processing is vital. This includes composites, ceramics, and advanced metals.

Precision and Efficiency: Enhanced laser systems offer precise control over heat and energy distribution, reducing material waste and processing time.

3 Application Development

Healthcare and Biomedicine: Laser technology is used for surgeries, imaging, and therapy. Advances in compact and portable laser devices are expanding its use in remote areas.

Defense and Security: High-energy laser systems for defense purposes, including directed energy weapons and counter-drone technology, are rapidly evolving.

Communications and Data: Fiber-optic networks driven by laser technology are enhancing global communication infrastructure.

4 Field Deployment and Practical Use

Miniaturization: Making laser devices smaller and more portable facilitates field deployment. Portable laser cutters, engravers, and medical devices are becoming common.

Environmental Adaptability: Lasers are being engineered to operate in diverse environments underwater, in space, and in extreme climates.

Training and Support: Ensuring field operators are trained in laser safety and maintenance is critical for successful deployment.

5 Regulatory and Safety Considerations

Standards and Compliance: Adhering to international laser safety standards is essential for both manufacturers and end-users.

Environmental Impact: Assessing the environmental impact of laser technologies, such as energy consumption and waste management, is increasingly important.

6 Future Trends

Integration with AI and IoT: Laser systems are likely to be integrated with AI algorithms and IoT sensors for real-time adjustments and predictive maintenance.

Quantum Advancements: Quantum technologies may enable the development of more efficient and powerful lasers.

Interdisciplinary Collaboration: Collaboration among scientists, engineers, and policymakers will drive further innovation and adoption.

In summary, accelerating laser technology from factory to field requires continuous innovation in manufacturing, materials science, application development, and deployment strategies.

"Laser technology is at the forefront of innovation, driving advancements in telecommunications, manufacturing, and healthcare."

Laser coding and marking systems are getting faster, as operators seek competitive advantage through greater productivity. In this 24/7 environment, fume and dust extraction technology is playing a vital role in keeping production lines moving, mitigating risk, and delivering both health protection and process improvement.

As **Richard Heard**, BOFA's Technical Product Manager, explains, this means an increased reliance on automation and performance data...and perhaps a change in mindset for managers when it comes to scheduled maintenance.

"We are all familiar with the phrase 'time is money', but in the world of high-volume manufacturing, it's probably more accurate to say that 'downtime is money'.

In the fast-moving consumer goods (FMCG) market, a revolution has taken hold in laser coding and marking, particularly in the food and beverage industry. It's all to do with speed. Where once the benchmark was to code around 50,000 products per hour, today laser marking lines for aluminium cans are able to operate at more than 100,000 cans ph.

The driver, of course, is increased productivity, enabled by a new generation of high efficiency fibre lasers that can ablate metal with accuracy at very high speed.
It's an evolution that makes the role of fume and dust extraction even more important, because with faster processing comes a requirement for technical innovation and greater filter capacity to capture potentially harmful airborne contaminants.

Remember, without reliable extraction systems, laser processes would simply not be able to function within the scope of workplace regulations governing the particulate exposure levels that protect human health.

The focus on speed in lasering results from the convergence of fibre laser technology and process automation. Automation enables the integration of lots of complementary systems to create one holistic solution. BOFA is part of that architecture, designing technology capable of capturing particulate at the point of laser ablation.

This is critical not just from an operative health perspective, but in ensuring that no fume or dust can travel beyond the process area and contaminate products or components, such as rollers or bearings. In this fast-moving world, return on investment is king, and unplanned downtime is the enemy. So, any unscheduled stoppage in a 24/7 operation would be hugely costly, particularly if it involved a major repair or replacement of equipment.

That's why BOFA systems are so integral to the goal of optimal productivity.

To offer manufacturers the support they need in this new era, BOFA has developed systems such as the **AD 1000 iQ**, which combines larger filter capacity with high airflow and pressure rates. Reverse flow air technology also reduces larger particulate velocity so that it falls into a drop out chamber which, along with variable air flow control, optimises the lifecycle of the pre-filter, HEPA and activated carbon filter stages.

At the same time, the onboard Intelligent Operating System (iQ) provides a visual read-out of filter condition in real-time, automatically alerts operatives to filter issues, and provides downloadable analytical data to analyse performance. This data enables routine maintenance to be more effectively planned in step with production schedules.

Interestingly, the move to much faster processing speeds has also meant a change of mindset for some managers from thinking in blocks of time for filter exchange to thinking in terms of process volumes.

And we've also been do some new thinking at BOFA. Not outside the box, but within it.

We know that high efficiency fibre lasers working aluminium can under certain circumstances create a thermal event. So, we have developed the **FireBox MA** and the **Spark Arrestor 2** to intercept and capture any hot embers before they can reach the extraction system.

In this way, we help mitigate the risk and in doing affirm our position as a friend of productivity and innovation."

HIMTEX 2024 : Transforming Manufacturing Excellence

The Hyderabad International Machine Tools Exhibition (HIMTEX) has established itself as a premier platform for showcasing advancements in the manufacturing and machine tools industry. Since its inception, HIMTEX has grown to become a significant event, bringing together industry leaders, technology innovators, and professionals from around the globe.

Inception and Early Years

2005: HIMTEX was first held in Hyderabad, India, marking the beginning of a journey that would shape the landscape of manufacturing exhibitions in the region. The inaugural event was designed to address the growing need for a dedicated platform where manufacturers could explore the latest technologies and solutions in machine tools and manufacturing processes.

2007-2009: The early years of HIMTEX saw gradual growth in both participation and visitor numbers. The focus was on providing a comprehensive exhibition that highlighted innovations in machine tools, automation, and related technologies.

Recent Developments

2020-2021: The COVID-19 pandemic impacted global events, and HIMTEX, like many other exhibitions, faced challenges. The event adapted by exploring virtual and hybrid formats to continue connecting industry professionals and showcasing innovations despite travel restrictions and safety concerns.

2022-2023: HIMTEX returned to an in-person format with a renewed focus on post-pandemic recovery and digital transformation in manufacturing. The exhibition featured enhanced health and safety protocols and embraced digital tools for a more interactive and engaging experience. The event continued to showcase cutting-edge technologies and foster discussions on the future of manufacturing.

HIMTEX 2024

2024: HIMTEX 2024, scheduled to take place from August 16 to 19 at the HITEX Exhibition Centre in Hyderabad, represents the latest chapter in the exhibition's history. This edition aims to highlight the transformative impact of emerging technologies on manufacturing excellence. Attendees can expect a dynamic showcase of innovations, live demonstrations, and insights into the future of manufacturing.

Event Highlights

HIMTEX 2024 is packed with exciting features that promise to elevate your understanding of manufacturing technology:

Innovative Exhibits: Explore cutting-edge solutions across automation, robotics, advanced materials, and smart manufacturing.

Live Demonstrations: Witness live showcases of groundbreaking technologies in action, offering hands-on experiences with the latest machinery and tools.

Innovator Showcases: Discover breakthrough products and solutions from leading startups and technology pioneers.

Expert Opinions

Gain insights from the experts who are shaping the future of manufacturing:

Keynote Speakers: Exclusive interviews with keynote speakers who will share their visions for the future of manufacturing.

Industry Leaders: Thought-provoking perspectives from top industry leaders on the challenges and opportunities facing the manufacturing sector.

Networking Opportunities

Maximize your experience at HIMTEX 2024 with our networking tips:

Strategic Networking: Learn how to connect with potential clients, partners, and industry peers.

Networking Events: Discover the various networking events and sessions designed to foster meaningful connections.

Exhibitor Spotlights

Meet the pioneers and leading companies exhibiting at HIMTEX 2024:

Company Profiles: In-depth profiles of key exhibitors and what they will bring to the table.

Featured Innovations: A look at some of the most exciting innovations that will be on display.

Visitor Information

Make the most of your visit with our practical guide:

Registration Details: Information on how to register for the event and secure your place.

Travel Tips: Advice on travel arrangements, accommodation options, and local attractions.

Venue Information: Essential details about the HITEX Exhibition Centre, including directions and facilities.

Significance in Laser world

- **Showcase of Technology:** HIMTEX provides a platform for manufacturers and suppliers of laser cutting, welding, and engraving machines to showcase their latest technologies and innovations. This allows attendees to see and experience the newest advancements in laser technology firsthand.
- **Networking Opportunities:** The event gathers industry professionals, including engineers, suppliers, and potential clients. This creates opportunities for networking, forming business partnerships, and discussing industry trends and challenges.
- **Market Insights:** Attendees can gain insights into market trends, emerging technologies, and competitive landscapes. This helps businesses stay informed about the latest developments and align their strategies accordingly.
- **Educational Workshops and Seminars:** HIMTEX often includes educational sessions where experts discuss various aspects of laser technology, including applications, maintenance, and future trends. This helps in knowledge sharing and skill enhancement.
- **Business Development:** For companies in the laser industry, HIMTEX can be a crucial platform for generating leads, meeting potential customers, and expanding their market presence.

Rocket Singh: Tales from the Laser Sales Front

Er. Keerthik Kumar began his career after graduating with a degree in Royal Mechanical Engineering from Karnataka State. His first job was in a call center working night shifts. After some time, he transitioned to sales as a medical representative, despite facing significant criticism from relatives and family.

Eventually, he moved into sales within the laser industry. Initially, he faced numerous challenges, with people treating him poorly, making him wait for long periods, and generally showing little respect. Undeterred, he continued to share his company's brochures and followed up diligently. He introduced himself as "**Keerthik Sir**" and handed out his visiting cards to everyone he met.

Keerthik mainly operated in the southern region, where he gradually built friendly and comfortable relationships with his customers. He believes that the essentials for success in sales are patience and perseverance, not formal education. Keerthik's journey also includes being involved with startups like Furnlite and Atoms as a founder and co-founder. His story is one of resilience and determination, making him a perfect candidate for "Rocket Man (Salesman of the Month)" in Laserman India magazine.

Essentials for success in sales are patience and perseverance, not formal education.

- Er. Keerthik Kumar

Global Giants : The power houses of laser manufacturing

In a world where precision and innovation were paramount, the laser manufacturing industry stood as a beacon of technological advancement. At the forefront of this industry were the Global Giants, titans whose influence and innovation had reshaped the landscape of manufacturing.

The Rise of Titans

It all began in the early 21st century. As industries worldwide recognized the potential of laser technology, a few companies emerged as pioneers. These were not just ordinary companies; they were the visionaries, the ones who dared to push the boundaries of what lasers could achieve. Among them were LuminaTech, Photon Industries, and Quantum Laser Corp.

LuminaTech, based in Germany, was renowned for its high-precision lasers used in medical and scientific applications. Photon Industries, hailing from Japan, focused on industrial lasers that revolutionized manufacturing processes. QuantumLaser Corp, an American company, led the charge in defense and aerospace applications, where precision and reliability were crucial.

Innovation and Expansion

The Global Giants were not content with their initial successes. They invested heavily in research and development, striving to create more powerful, efficient, and versatile lasers. LuminaTech developed a laser that could perform intricate eye surgeries with unprecedented accuracy, restoring sight to thousands. Photon Industries introduced a laser cutting technology that reduced waste and increased production speeds, transforming factories around the world. QuantumLaser Corp's innovations in laser targeting systems made defense operations safer and more effective.

As their technologies advanced, so did their reach. The Global Giants expanded their operations to new markets, establishing partnerships and subsidiaries across continents. Their lasers became integral to industries as diverse as automotive manufacturing, telecommunications, and even art restoration.

Challenges and Triumphs

However, the journey was not without challenges. The rapid pace of innovation led to fierce competition, not just among the Global Giants, but also from emerging players in the industry. There were also technical challenges, such as managing the immense heat generated by powerful lasers and ensuring safety in their use.

Despite these obstacles, the Global Giants persevered. They formed alliances, shared knowledge, and set industry standards that ensured the safe and effective use of laser technology. Their commitment to excellence and innovation earned them the trust of industries worldwide.

The Future Beckons

Today, the Global Giants continue to lead the charge in laser manufacturing. Their technologies are integral to the development of new fields such as quantum computing, advanced medical treatments, and space exploration. They are not just manufacturers; they are the architects of a future where lasers play a pivotal role in shaping the world.

As they look to the future, the Global Giants remain committed to pushing the boundaries of what is possible. They understand that their true power lies not just in their technological prowess, but in their ability to inspire and drive progress. And so, the story of the Global Giants continues, a testament to the power of innovation, vision, and relentless pursuit of excellence.

Top power houses of laser manufacturing world

Rank	Company Name	Country	Year Established	Unique Feature
1	Trumpf	Germany	1923	Multipurpose laser systems (welding, cutting & surface treatment
2	Bystronic	Swizerland	1964	Digitalized sheet metal processing
3	Amanda	Japan	1980	High-precision beam delivery and accurate motion
4	Mazak	Japan	1919	Innovative laser-cutting solutions
5	Prima Power	Italy	1977	LASERDYNE Smart Techniques
6	Messer	Germany	1898	Powerful laser-plasma combination
7	Salvagnini	Italy	1963	Switzerland
8	Mitsubishi	Japan	1870	Laser machines with fast CNC control units
9	Tanaka	Japan	1917	High-power machines for cutting large metal plates
10	GWeike	China	2004	Beyond Manufacture-combining, digitization with technological evolution

Laser Legacy: End user experience unfolded

Customer experiences with laser products can vary widely based on the type of product, the manufacturer, and the specific use case. Here are some general trends and feedback commonly associated with laser products from various companies:

1. Laser Printers

HP

Customers often praise HP laser printers for their reliability, print quality, and ease of use. However, some users report issues with the cost of replacement toner cartridges and occasional connectivity problems.

Brother

Brother laser printers are appreciated for their affordability, durability, and low cost of ownership. Users often mention that these printers are ideal for small businesses and home offices.

Canon

Canon laser printers receive positive feedback for their high-quality prints and robust construction. Some users, however, note that the initial setup can be a bit complicated.

2. Laser Pointers and Presentation Tools

Logitech

Logitech's laser pointers are frequently highlighted for their ergonomic design, reliability, and ease of use during presentations. Customers appreciate the intuitive controls and long battery life.

DinoFire

DinoFire laser pointers are praised for their affordability and functionality. Users like the wide range of features, including built-in timers and volume control for presentations.

3. Laser Engravers and Cutters

Glowforge

Glowforge users often rave about the ease of use and versatility of these laser cutters/engravers. They appreciate the precision and the ability to work with various materials. However, some customers mention concerns about the high price and customer service responsiveness.

Epilog

Epilog laser engravers are commended for their professional-grade quality and reliability. Users in industries like signage, awards, and custom products value the precision and robustness of these machines.

4. Laser Rangefinders

Bosch

Bosch laser rangefinders are well-received for their accuracy, durability, and ease of use. Customers in construction and DIY projects appreciate the advanced features like Bluetooth connectivity and measurement memory.

Leica

Leica rangefinders are noted for their high precision and advanced features, making them popular among professionals in architecture and surveying. Some users, however, find them to be on the expensive side.

5. Laser Hair Removal Devices

Tria Beauty

Tria laser hair removal devices get mixed reviews. Many users see significant hair reduction over time and appreciate the convenience of at-home treatments. However, others report issues with pain during use and varying effectiveness depending on hair and skin type.

Silk'n

Silk'n laser hair removal devices are generally liked for their affordability and ease of use. Users find them effective for long-term hair reduction, though some experience slower results and skin irritation.

6. Laser Levels

DeWalt

DeWalt laser levels are praised for their ruggedness, accuracy, and visibility in various lighting conditions. Customers in construction and DIY sectors find them reliable and easy to use.

Makita

Makita laser levels are appreciated for their build quality and precision. Users like the straightforward operation and the brand's reputation for durability.

General Feedback Themes

- Quality and Reliability: High-quality laser products from reputable brands tend to receive positive feedback for their reliability and performance.
- Cost: While many users are willing to pay a premium for quality, cost remains a common concern, especially for consumables like toner cartridges and for high-end professional equipment.
- Customer Support: Effective customer service and support are crucial. Positive experiences often correlate with responsive and helpful support teams, while poor support can significantly impact overall satisfaction.
- Ease of Use: Products that are user-friendly, with clear instructions and intuitive interfaces, are consistently rated higher by customers.
- Durability: The longevity and robustness of laser products are important, particularly for tools and devices used in professional settings.

These experiences highlight the importance of balancing performance, cost, and support to meet customer expectations effectively.

"In the future, lasers will be as ubiquitous and essential as computers are today."

— Dr. Arthur Schawlow, Co-Inventor of the Laser

Startup Beam: Launching Your Business with Lasers

Laser Precision Agriculture Solutions

Leveraging laser technology to revolutionize the agriculture sector, this startup idea focuses on using precision laser systems to enhance crop management, irrigation, and pest control.

Application to Showcase:

Laser-Guided Precision Irrigation Systems

This application involves the use of laser technology to optimize water usage in agriculture through laser-guided precision irrigation systems. These systems utilize laser sensors to analyze soil moisture levels in real-time and direct water flow precisely where and when it's needed, significantly reducing water waste and ensuring optimal hydration for crops.

Key Components

1 Laser Leveling Equipment

Laser leveling involves using a laser-guided system to create a perfectly level field, which is essential for uniform water distribution. The laser level emits a beam that serves as a reference for ensuring the field is even, eliminating low and high spots that could lead to inefficient water use.

2 Irrigation Controllers with Laser Guidance

These controllers are integrated with laser sensors to monitor and guide the irrigation process in real-time. They can adjust water flow rates and distribution patterns based on the topography of the field and the specific needs of the crops.

3 Sensors and Monitoring Systems

Sensors placed throughout the field measure soil moisture levels, temperature, and other environmental factors. These sensors are often linked to the laser-guided system, providing data that can be used to fine-tune irrigation practices.

4 Automated Irrigation Systems

Automation in irrigation systems allows for precise control over when and how much water is delivered. The integration of laser technology ensures that these systems can adapt to the specific layout and needs of the field, providing consistent and efficient irrigation.

"Lasers are the ultimate precision tool. They have transformed industries and continue to drive innovation in fields ranging from medicine to manufacturing."

— Dr. John O'Hagan

Key Features

1 Real-Time Soil Moisture Monitoring
Laser sensors continuously monitor the soil moisture levels across different sections of the field, providing accurate data for irrigation decisions.

2 Automated Water Distribution:
The system uses the data from laser sensors to automatically adjust water flow, ensuring each plant receives the right amount of water.

3 Water Conservation
By targeting water only where it's needed, the system conserves water, making it a sustainable solution for agriculture.

4 Increased Crop Yield
Optimized watering schedules lead to healthier crops and higher yields, benefiting farmers economically.

5 Remote Monitoring and Control
Farmers can monitor and control the irrigation system remotely through a user-friendly interface, allowing for efficient farm management.

Benefits

- **Cost Savings**
  Reduced water usage translates to lower utility costs for farmers.
- **Environmental Impact**
  Efficient water management reduces the environmental footprint of farming operations.
- **Scalability**
  The technology can be scaled from small farms to large agricultural enterprises.
- **Market Potential**
  With increasing focus on sustainable farming practices, the market for precision agriculture solutions is poised for significant growth.

As the global population grows and the demand for food increases, efficient water management in agriculture will become even more critical. Laser-guided precision irrigation systems offer a promising solution to this challenge. As technology advances and becomes more affordable, it is likely that these systems will become more widespread, playing a key role in the future of sustainable agriculture. Laser-Guided Precision Irrigation Systems exemplify how laser technology can bring innovation and efficiency to agriculture. This startup idea not only addresses critical issues like water scarcity but also enhances productivity and sustainability in farming, making it an ideal application to showcase in the "Startup Beam" section of Laserman India magazine.

Edu Laser Shaping the future through academic excellence

Edu-Lasers is an innovative educational initiative aimed at enhancing academic excellence and shaping the future of education.The term "Lasers" symbolizes precision, focus, and advanced technology in the educational context. Edu-Lasers is committed to shaping the future through a relentless focus on academic excellence. By leveraging advanced technologies and precision teaching methods, Edu-Lasers aims to create a transformative educational experience that empowers students and prepares them for success in an ever-changing world.

Advanced Learning Technologies

Utilizes the latest educational technologies to create an engaging and effective learning environment.

- Interactive digital platforms.
- Virtual and augmented reality tools.
- AI-driven personalized learning systems.

Precision Teaching Methods

Focuses on targeted teaching strategies that address individual student needs and learning styles.

- Data-driven instruction.
- Adaptive learning paths.
- Continuous assessment and feedback.

Academic Excellence

Curriculum Development

A robust and dynamic curriculum designed to foster academic rigor and intellectual curiosity.

- Integration of STEM (Science, Technology, Engineering, and Mathematics).
- Emphasis on critical thinking and analytical skills.
- Inclusion of arts and humanities for a well-rounded education.

Teacher Training

Professional development programs to equip educators with the skills and knowledge needed to implement advanced teaching techniques.

- Workshops and seminars.
- Collaborative teaching approaches.
- Ongoing support and mentorship.

Shaping the Future

Student Empowerment

Preparing students to be future leaders, innovators, and responsible global citizens.

- Encouraging creativity and innovation.
- Promoting ethical and social. responsibility.
- Providing career guidance and support.

Community Engagement

Building strong partnerships with parents, local communities, and industries to enhance educational outcomes.

- Parent-teacher associations
- Industry collaborations for real-world learning experiences
- Community service and outreach programs

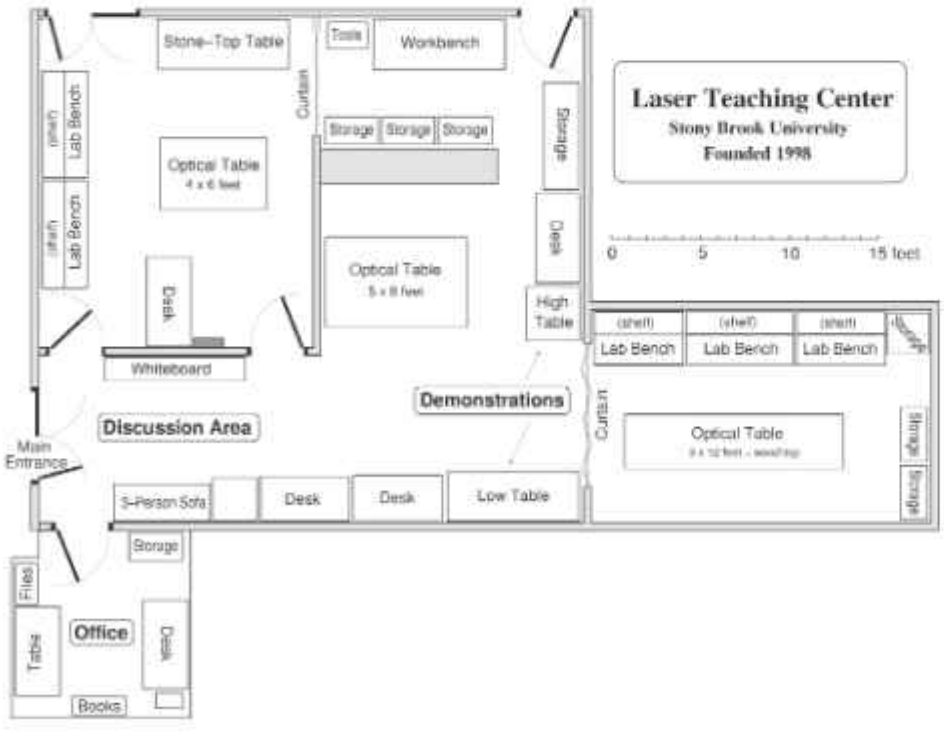
Impact and Outcomes

- Improved Academic Performance: Higher test scores, better grades, and increased student engagement.
- Enhanced Critical Thinking Skills: Students are better equipped to analyze, evaluate, and create solutions to complex problems.
- Future-Ready Graduates: Alumni who are well-prepared for higher education and the workforce, with skills that are relevant to the 21st-century economy.

The Center for Laser Education and Research: Stony Brook University

The Laser Teaching Center is a unique university-based educational environment primarily devoted to highly personalized active learning through the development of individual hands-on student projects broadly related to optics and lasers. The participants include local high school students and young undergraduates who are new to optics and research, and graduate students in an optics rotation course. We describe the history and facilities of the Center, its educational philosophy and methods, and the experience obtained in nine years of operation.

Stony Brook University



In the central area of the lab, several desks hold the computer stations that students utilize for their writing and internet research, and two tables hold a variety of additional demonstrations such as fish-tank optics, and polarized light effects. This area can accommodate groups of up to about fifteen standing students on tours. Elsewhere in the laboratory the closed room with the 4x6 foot optical table has been primarily used for longer-term experiments, including sonoluminescence, optical tweezers and Rb spectroscopy. The entire laboratory is decorated with posters somehow related to optics, including a number from past student projects. There are also two more large (2x8 foot) whiteboards (made from a cut 4x8 foot Melamine coated sheet) adjacent to the 5x8 and 3x12 foot optical tables.

Prof. Sanjay Tiwari: A Pioneer in Laser Technology Education

In the second edition of Laserman India magazine, we are proud to feature Prof. Sanjay Tiwari, who is currently serving as the Vice-Chancellor of Madhya Pradesh Bhoj (Open) University, Bhopal. Prof. Tiwari is a trailblazer in the field of laser technology education, having introduced the M.Tech. program in Opto Electronics and Laser Technology at the School of Studies in Electronics & Photonics, Pt. Ravishankar Shukla University, Raipur. This program, the first of its kind in Chhattisgarh, has significantly contributed to the advancement of laser applications in the state.

The Editor-in-Chief of Laserman India, Prof. (Dr.) N.Kumar Swamy, was a student of the first batch of this pioneering course. He has continued to carry the torch for the laser community through this magazine. Other notable students of Prof. Tiwari include Mr. Nagendra Rawat, Founder of Atoms Technologies, and numerous others like Ms. Kshama Soni and Mr. Gajendra Singh Rathore, who have all thrived under his mentorship.

Prof. Sanjay Tiwari: A Distinguished Career

Before assuming his role as Vice-Chancellor, Prof. Tiwari was the Professor and Head of the School of Studies in Electronics & Photonics at Pt. Ravishankar Shukla University, Raipur. He also led and coordinated the Institute of Renewable Energy Technology & Management at the same university, where he initiated skill development courses under the National Skill Development Corporation (NSDC).

Prof. Tiwari has guided over 21 doctoral researchers and 89 M.Tech. Optoelectronics students. His research has been widely recognized, with over 1100 citations in the last 18 years.

Academic and Research Excellence

Prof. Tiwari's academic journey includes post-doctoral and visiting research professor positions at prestigious institutions such as the University of Cambridge (U.K.), University of California, the International Center of Theoretical Physics (Italy), and IBM's Almaden Research Lab in San Jose, California. He also holds a CMI Level 5 Certificate in Leadership and Management from the Chartered Management Institute, Dudley College, UK.

He has been honored with numerous fellowships and awards, including the USIEF prestigious US Fulbright-Nehru Senior Research Fellowship, UK-India Education and Research Initiative (UKIERI) Fellowship, and SAARC Fellowship. He is a Senior Member of IEEE, a Senior Associate of Abdus Salam International Centre for Theoretical Physics Italy, and has received the Best Fulbright Alumni Award. Additionally, he is a Chartered Engineer and Fellow of the Institution of Engineers and the Institution of Electronics and Telecom Engineers.

Prof. Tiwari has twice received the National UGC Research Award from the University Grants Commission, New Delhi, and has been recognized as a Cambridge University Academic Fellow and UKIERI Award recipient by the British Council. He was also honored with the Best Young Scientist Award by Madhya Pradesh for his research contributions.

Leadership and Contributions

Prof. Tiwari has held various significant positions, including Chairman of the Central Board of Studies in Electronics for the Higher Education Directorate of the Government of Chhattisgarh and membership on the Board of Studies in Computer Science at Pt. Sunder Lal Sharma Open University, Bilaspur. He has also served on the Departmental Research Committee at the School of Studies in Electronics & Photonics, Pt. Ravishankar Shukla University, Raipur.

His involvement extends to being a member of Boards of Studies and Departmental Research Committees at prestigious universities such as Guru Ghasidas University, Bilaspur, Jammu University, Indira Kala Sangeet Vishwavidyalaya, Khairagarh, Rani Durgavati University, Jabalpur, and Sambalpur University, among others.

Innovative Programs and Global Engagement

Prof. Tiwari has introduced national innovative programs such as the M.Tech. in Optoelectronics & Laser Technology and the Bachelor of Vocation program in Renewable Energy. He established the Computer Centre Confidential at Pt. Ravishankar Shukla University, Raipur, to prepare in-house results.

He is widely traveled and has presented papers, given invited and plenary lectures, and chaired sessions at numerous national and international conferences, symposia, and seminars. His engagements include notable institutions like Imperial College London, Cavendish Laboratory at Cambridge, University of California Santa Cruz, IBM Research Center in San Jose, Gwangju Institute of Science & Technology in South Korea, and ICTP in Trieste.

Prof. Tiwari has organized over 50 seminars, workshops, and conferences at national and international levels and is a Solar Chartered Engineer by the Solar Energy Society of India (SESI) and a Fellow of the Indian Social Science Academy.

Laserman India magazine is proud to feature Prof. Sanjay Tiwari under the "Edu-Lasers: Shaping the Future Through Academic Excellence" section, celebrating his remarkable contributions to laser technology education and research.

Required Laser Machine Operator

For Padgha, Bhiwandi (Engineering Projects)
Exp. 2-7 Yrs **Salary** 3-4 Lacs PA
Location : Mumbai Suburban, Thane, Mumbai (All Areas)
Only Male minimum
Openings for - Laser Cutting, Laser machine operator, Fabrication,Reactors, Heat Exchangers
Posted by Job Search

Sr. Engineer (Laser Cutting Machine)

Shamrock Value Private Limited
Location : Raipur, Chhattisgarh
Salary: ₹35,000 - ₹60,000 Per Month
Posted by Posted by indeed.com

Laser Application Engineer

Company : Coherent Corp., Chennai India
Location : Hyderabad, Telangana, India

Graduate Engineer Trainee (GET)

Company : Magod Laser Machining Pvt Ltd
Location : Bengaluru
Salary: ₹15,500.00 - ₹21,000.00 Per Month

Laser Programmer

Company : A-Z Virtual
Location : Bengaluru, Karnataka
Salary: ₹2,16,000 - ₹2,40,000 a year
Posted by indeed.com

Laser Engineer

Company : Dynotech Instruments Pvt. Ltd.
Location : New Delhi, Delhi, India
On-site Job, Full-time
Required 11-50 employees

Laser Physics jobs

Visit : https://academicpositions.com/jobs/field/laser-physics

Upcoming Conference Events in Laser Industry

SN	Event Name	Date	Venue	Website
1	Hyderabad International Machine Tool & Engineering Expo	16-19 Aug 2024	HITEX Exhibition Centre, Hyderabad	https://himtex.in/
2	SPIE Optics + Photonics 2024	18-22 Aug 2024	San Diego, California, US	https://spie.org/op_coms
3	Laser Ioinzation Spectroscopy of Actinides-LISA Final Conference	1-4 Sept 2024	CERN Meyrin, Switzerland	https://indico.cern.ch/event/1358967/
4	Photon 2024	3-6 Sept 2024	Swansea, United Kingdom	https://www.iop.org/physics-community/iop-conferences
5	EOSAM 2024-European Optical Society Annual Meeting	9-13 Sept 2024	Naples, Italy	https://www.europeanoptics.org/events/eos/eosam2024.html
6	The 25th China International Optoelectronic Exposition (CIOE 2024)	11 - 13 September 2024	Shenzhen World Exhibition and Convention Center, China	https://www.cioe.cn/CIOE/2024/GoogleAD/index.html
7	LANE-2024-13th CIRP Conference on Photonics Technology	15-19 Sept 2024	Fuerth, Germany	https://www.lane-conference.org/
8	FiO+LS-Frontiers in Optics + Laser Science Conference 2024	23-26 Sept 2024	Denver, United States	https://www.frontiersinoptics.com/home/about-fio-ls/
9	International Conference on Laser Ablation-COLA 2024	29 Sept-4 Oct 2024	Crete, Greece	https://cola2024.eventsadmin.com/
10	18th International Conference on Laser Applications in Life Science	11-14 Oct 2024	Muğla,Turkey	https://lals.sciencesconf.org/
11	Optica Laser Congress and Exhibition	20-24 Oct 2024	Grand Prince Hotel Osaka Bay, Japan	https://www.optica.org/events/
12	International Conference on Optics and Laser technology	24-25 Oct 2024	Paris, France	https://www.scitechseries.com/optics
13	5th International Conference on Optics, Photonics, and Lasers - Hybrid (OPL-2024)	25-27 Nov 2024	Barcelo Valencia HOTEL, Spain	https://opticsconference.org/
14	7th Laser, Optics and Photonics Summit (Optics Meet 2024)	16-17 Dec 2024	Osaka, Japan	https://spectusconferences.com/optics-photonics-conference/
15	13th International Conference on Photonics, Optics and Laser Technology	22-24 February 2025	Porto – hybrid, Portugal	https://photoptics.scitevents.org/
16	International Expo & connect on Lasers, Optics and Photonics	24-26 March 2025	Paris, France	https://www.lopconnect2025.org/#home
17	CLEO 2025-Conference on Lasers and Electro-Optics	4-9 May 2025	Long Beach, California, United States	https://www.cleoconference.org/home/about-cleo/
18	World of Photonics Congress 2025	22-27 June 2025	Europe	https://world-of-photonics.com/en/congress/
19	LASER World of PHOTONICS 2025	24-27 June 2025	Trade Fair Center Messe München	https://world-of-photonics.com/en/trade-fair/
20	Optica Industry Summit on Laser Optics at Edmund Optics	8-9 April 2025	Oldsmar, Florida, United States	https://www.optica.org/events/industry_events/2025/optica_industry_summit_on_laser_optics_at_edmund_optics/

LASERMAN INDIA

CALL FOR CONTRIBUTIONS

We are thrilled to announce that preparations for the second edition of Laserman India Magazine, set to be released in **Sept** 2024, are well underway!

As we continue to explore the ever-evolving landscape of laser technology, we invite experts, enthusiasts, and professionals from across the industry to contribute articles for this upcoming edition.

WHAT WE'RE LOOKING FOR

Our magazine is divided into several sections, each designed to cater to various interests within the laser technology sphere. We are seeking submissions for the following sections:

- Industry Insights: Deep dives into the latest trends, innovations, and challenges facing the laser technology industry today.
- Research & Development: Original research, case studies, or reviews of significant advancements in laser technology.
- Applications & Use Cases: Exploration of laser technology applications across different industries, including but not limited to manufacturing, healthcare, communication, and entertainment.
- Opinions & Interviews: Thought-provoking opinion pieces on the state of laser technology and interviews with leading figures making an impact in the field.
- Emerging Technologies: Articles focused on the intersection of laser technology with other emerging technologies like artificial intelligence, quantum computing, and nanotechnology.
- Tutorials & Guides: Educational content aimed at both beginners and advanced practitioners, offering practical advice, tips, and step-by-step guides.

SUBMISSION GUIDELINES

To ensure the highest quality and relevance of content, we ask all contributors to adhere to the following guidelines:

- Relevance: All articles must be directly related to laser technology and its applications.
- Originality: Submissions must be original, unpublished work and not under consideration for publication elsewhere.
- Quality: Articles should be well-researched, fact-checked, and written in clear, concise English. Technical accuracy is paramount.
- Length: Articles should be between 500 and 2,000 words in length, though exceptions can be made for in-depth pieces.
- Formatting: Please submit your article in a Microsoft Word document or a Google Docs link, using Times New Roman, 12-point font, and double-spaced formatting.
- Images & Graphics: High-resolution images and graphics that enhance the article are highly encouraged. Please ensure you have the rights to use any images you submit.

HOW TO SUBMIT

Email: lasermanindia@gmail.com
website: www.lasermanindia.com
Contact No.: 9827788538

Laser Enthusiasts: Introducing Mr. Priyank Joshi

"Laser enthusiasts" refers to individuals who have a strong interest or passion for lasers and their various applications. These people are often fascinated by the science and technology behind lasers, and they may be involved in activities such as researching, experimenting, or using lasers in different fields such as engineering, medicine, manufacturing, entertainment, or hobbyist projects. Laser enthusiasts can range from professionals working in industries that utilize laser technology to hobbyists who enjoy exploring laser-based projects and innovations in their spare time.

In this column, Laserman India magazine introduces Mr. Priyank Joshi, the National Sales Manager at TRUMPF. A technical professional dedicated to helping companies find suitable laser solutions for their application challenges, Mr. Joshi is at the forefront of promoting advanced laser technologies in various industries. One of Mr. Joshi's key focus areas is in the realm of electromobility. The battery pack, which combines all components of a battery system, represents the heart of an electric car. TRUMPF provides a unique complete solution for electromobility that meets the stringent requirements for tightness, crash safety, productivity, and flexibility. This advanced solution enables precise welding of all interior components and the battery housing, ensuring process reliability through an intelligent sensor system.

Lasers are indispensable tools in battery pack production, offering innovative solutions for the integration and production of the cooling system. The precision of lasers allows for the manufacturing of sheet metal components in the battery pack using TRUMPF's networked system solutions. For instance, the battery tray is laser cut, reshaped, and laser welded, ensuring high precision and durability.

Mr. Priyank Joshi plays a crucial role in promoting these advanced laser applications in India. His efforts help Indian companies leverage TRUMPF's state-of-the-art laser technology to enhance the production quality and efficiency of battery packs for electric vehicles. By introducing these cutting-edge solutions, Mr. Joshi is contributing to the growth of electromobility in India, facilitating the transition to sustainable and high-performance electric vehicles. In addition to his work in battery welding, Mr. Joshi has been instrumental in demonstrating the versatility of laser applications across various sectors. Lasers are used for cutting, welding, marking, and surface treatment, making them essential in the manufacturing of automotive components, electronics, medical devices, and more. Through his expertise and dedication, Mr. Joshi ensures that TRUMPF's clients receive tailored laser solutions that meet their specific needs, driving innovation and efficiency in their operations.

Laserman India magazine is proud to feature Mr. Priyank Joshi, acknowledging his significant contributions to advancing laser technology and promoting its applications across industries in India.

Mr. Priyank Joshi plays a crucial role in promoting these advanced laser applications in India. His efforts help Indian companies leverage TRUMPF's state-of-the-art laser technology to enhance the production quality and efficiency of battery packs for electric vehicles.

"Lasers have revolutionized surgery by offering a less invasive alternative to traditional methods, resulting in quicker recovery times and improved patient outcomes."

— Dr. Susan Greenfield, Medical Laser Specialist

Laser illumination Regional Spotlight: Hyderabad

Hyderabad, the capital city of the Indian state of Telangana, is a vibrant hub known for its rich cultural heritage, rapidly growing tech industry, and diverse economic activities. In the context of laser illumination, Hyderabad has been gaining attention due to several factors:

Tech and Research Hub

Hyderabad hosts a number of prestigious research institutions and universities, such as the Indian Institute of Technology (IIT) Hyderabad and the International Institute of Information Technology (IIIT) Hyderabad. These institutions contribute to research and development in advanced technologies, including photonics and laser applications.

Industrial Growth

The city's thriving IT and electronics industries provide a strong foundation for innovation and adoption of advanced technologies, including laser systems. The presence of numerous tech parks and multinational companies fosters a conducive environment for startups and established companies alike to explore new technologies.

Cultural and Entertainment Applications

The city's cultural richness and active entertainment industry create opportunities for the use of laser illumination in events, shows, and exhibitions. Laser light shows and projections have become popular for public events and celebrations.

Healthcare and Medical Research

Hyderabad is also a significant center for medical research and healthcare. The use of laser technology in medical treatments, such as ophthalmology, dermatology, and surgery, is becoming increasingly prevalent. The city's advanced healthcare infrastructure supports these applications.

Government and Policy Support

The Telangana government has been proactive in supporting technological advancements and innovation. Initiatives like the Telangana Innovation Hub (T-Hub) and the state's focus on becoming a major tech destination help attract investments in emerging technologies, including laser systems.

Hyderabad, like many cities around the world, experienced significant changes due to the COVID-19 pandemic, including in the field of laser illumination and related technologies.

Academic & Professional Conferences

Hyderabad often hosts international conferences and exhibitions related to photonics, laser technology, and other advanced fields. These events provide platforms for knowledge exchange, networking, and showcasing new developments in laser illumination and related areas.

The city's infrastructure, talent pool, and supportive ecosystem make it an ideal location for exploring and implementing laser illumination technologies. Whether in research, industrial applications, medical uses, or entertainment, Hyderabad offers a promising environment for growth in this field.

Hyderabad, like many cities around the world, experienced significant changes due to the COVID-19 pandemic, including in the field of laser illumination and related technologies. The periods before and after the lockdown brought different challenges and opportunities:

Before Lockdown

Steady Growth in Tech and Innovation
Prior to the lockdown, Hyderabad was witnessing a steady growth in its tech and innovation sectors. The city's strong presence in IT and research, coupled with government initiatives like T-Hub, provided a conducive environment for the development of advanced technologies, including laser illumination.

Active Industrial and Research Collaboration
Companies and research institutions in Hyderabad were actively collaborating on projects related to photonics, laser technology, and optics. These collaborations were often facilitated by a vibrant academic ecosystem, with institutions like IIT Hyderabad and IIIT Hyderabad playing key roles.

Healthcare Advancements
The city's medical infrastructure was increasingly adopting laser technologies for various applications, including ophthalmology, dermatology, and minimally invasive surgeries. There was growing interest in exploring new laser-based medical treatments.

Cultural and Entertainment Sector
The use of laser illumination in cultural events, festivals, and entertainment shows was becoming more popular, with laser light shows and projections being featured in various public and private events.

During and After Lockdown

Disruption and Slowdown
The lockdown and subsequent restrictions led to disruptions in various sectors. Research activities slowed down due to limited access to laboratories and facilities. The manufacturing sector, including industries involved in producing laser systems, faced challenges due to supply chain disruptions.

Shift to Remote Work and Digital Solutions
The tech industry, including companies working on laser technologies, adapted by shifting to remote work and digital collaboration tools. This transition led to an increased focus on software development, simulations, and virtual prototyping.

Healthcare Focus
The pandemic put immense pressure on the healthcare system, leading to a temporary shift in focus towards COVID-19-related healthcare needs. However, the importance of non-invasive and precision medical treatments, including those involving laser technology, remained relevant.

Post-Lockdown Recovery and Innovation
As restrictions eased, there was a gradual recovery in research and industrial activities. The pandemic highlighted the need for innovation in various fields, including healthcare and remote communication technologies.

The laser illumination sector began exploring new applications, such as disinfection and sterilization, leveraging UV laser technology.

Digital and Hybrid Events
The cultural and entertainment sectors started experimenting with digital and hybrid events, where laser illumination and virtual projections played a significant role. This adaptation allowed for continued public engagement despite social distancing measures.

Key Takeaways

- **Innovation Resilience**
  Despite the challenges posed by the lockdown, Hyderabad's innovation ecosystem demonstrated resilience, with continued interest in advanced technologies.
- **New Opportunities**
  The pandemic created new opportunities for laser technologies, particularly in healthcare and remote interactions.
- **Evolving Cultural Landscape**
  The use of laser illumination in digital and hybrid formats for cultural events showed the versatility and adaptability of the technology.

Mr. Vinoth Sasidharan
Marketing Manager
HIMTEX, Hydrabad

> I can create a motivated and inspired team that drives success in the laser industry.

Q: Can you share your journey in the laser industry and what inspired you to pursue a career in this field?

Mr. Sasidharan: My journey in the laser industry has been both exciting and rewarding. I was initially drawn to this field because of its cutting-edge technology and its potential to revolutionize various industries. The precision and versatility of lasers intrigued me, and I was eager to be part of something that had such a wide range of applications—from manufacturing to medical treatments and beyond. Over time, I had the opportunity to work on diverse projects, from developing new laser systems to optimizing existing ones for efficiency and effectiveness. Each project taught me something new and deepened my passion for this field.

Q: What truly inspires me is the constant innovation in the laser industry.

Mr. Sasidharan: There's always something new to learn and develop, whether it's improving laser precision, increasing energy efficiency, or finding new applications for laser technology. Being part of a field that is continually evolving keeps me motivated and excited about what the future holds.

Q: What were some of the key turning points in your career within the laser industry?

Mr. Sasidharan: There have been several key turning points in my career within the laser industry that have shaped my professional journey. 1. Joining My First Laser Technology Firm: The first major turning point was when I joined a leading laser technology firm early in my career.

Q: What were some of the key turning points in your career within the laser industry?

Mr. Sasidharan: There have been several key turning points in my career within the laser industry that have shaped my professional journey. ***1. Joining My First Laser Technology Firm:*** The first major turning point was when I joined a leading laser technology firm early in my career. This experience provided me with hands-on exposure to advanced laser systems and introduced me to the intricacies of laser applications across various industries. ***2. Working on a Breakthrough Project:*** Another pivotal moment came when I was part of a project that aimed to develop a highly efficient laser system for industrial cutting. This project required innovative thinking and collaboration with a multidisciplinary team. The successful completion of this project not only boosted my confidence but also earned me recognition within the industry. ***3. Transitioning to a Leadership Role:*** A key turning point was when I transitioned from a technical role to a leadership position. Leading a team of engineers and researchers allowed me to influence the direction of projects and drive innovation in laser technology. It also gave me the opportunity to mentor younger professionals, which has been incredibly fulfilling. ***4. Expanding into New Applications:*** Lastly, expanding my work into new and emerging applications of laser technology, such as medical devices and environmental monitoring, marked a significant shift in my career. This diversification not only broadened my expertise but also kept me engaged with the latest advancements in the industry.

Q: How do you motivate and inspire your team in the laser industry?

Mr. Sasidharan: Motivating and inspiring a team in the laser industry involves a blend of clear communication, recognition, Clear Vision and Goals, Continuous Learning, Recognition and Rewards, Collaborative Environment, Supportive Leadership and Innovation Encouragement and fostering a collaborative environment. By combining these strategies, I can create a motivated and inspired team that drives success in the laser industry.

Q: What are the biggest changes you've seen in the laser industry during your career?

Mr. Sasidharan: The laser industry has seen significant advancements and transformations over the years. Some of the biggest changes include: Technological Advancements, Increased Automation, Expansion of Applications, Miniaturization, Cost Reduction, Environmental Considerations, Regulatory and Safety Standards, Advances in Laser Materials Processing, Advances in Laser Materials Processing. These changes have collectively pushed the boundaries of what is possible with lasers, making the industry more dynamic and influential across various sectors.

Q: What trends do you predict will shape the future of the laser industry?

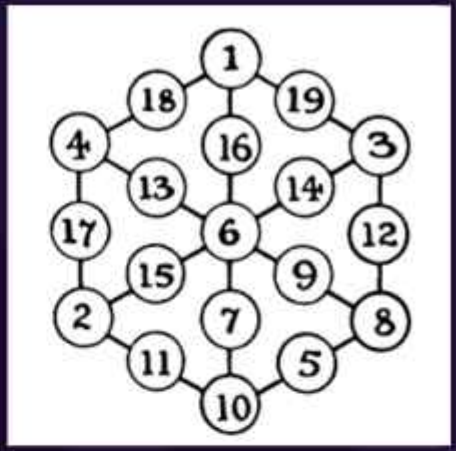
The future of the laser industry is likely to be shaped by several key trends, driven by technological advancements, market demands, and global challenges. Some trends to watch Continued Growth of Fiber Lasers, Rise of Ultrafast Lasers, Integration with Artificial Intelligence (AI) and Machine Learning, Expansion of Laser-Based Additive Manufacturing, Green Laser Technology, Advancements in Quantum Cascade Lasers (QCLs), Miniaturization and Portability, Growth in Medical Laser Applications, Increased Focus on Laser Safety and Regulation, Emergence of New Laser Materials and Wavelengths. These trends suggest a future where lasers play an even more integral role across a wide range of industries, driven by advancements in technology, a focus on sustainability, and the pursuit of precision and efficiency.

Q: How do you stay inspired and continue to innovate in the laser industry?

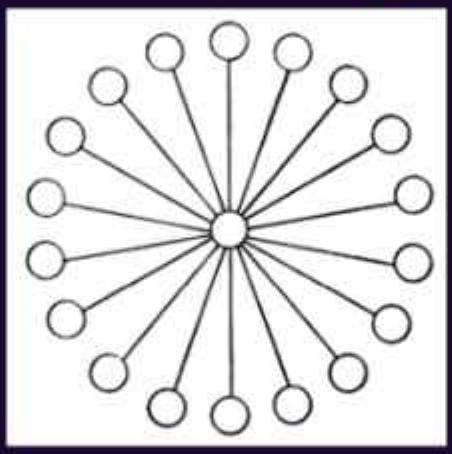
Mr. Sasidharan: Staying inspired and continuing to innovate in the laser industry requires a combination of curiosity, continuous learning, and a proactive approach to challenges. Some strategies that can help like Continuous Learning and Skill Development, Networking and Collaboration, Hands-On Experimentation, Monitoring Industry Trends, Customer Feedback and Problem-Solving, Cross-Industry Insights, Creative Thinking and Brainstorming, Embracing Challenges, Mentorship and Teaching, Personal Passion and Curiosity. By combining these strategies, I can maintain a high level of inspiration and continue to drive innovation in the laser industry, ensuring that your work remains relevant and impactful.

THE MAGIC HEXAGON

In the illustration it will be seen how we have arranged the numbers 1 to 19 so that all the twelve lines of three add up to 23. Six of these lines are, of course, the six sides, and the other six lines radiate from the center. Can you find a different arrangement that will still add up to 23 in all the twelve directions? There is only one such arrangement to be found.



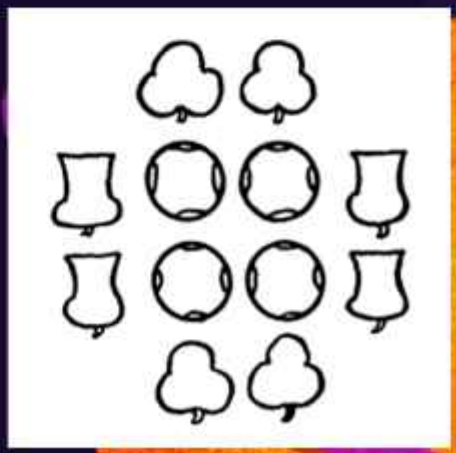
THE WHEEL PUZZLE



Place the numbers 1 to 19 in the 19 circles, so that wherever there are three in a straight line they shall add up to 30. It is, of course, very easy

ROSES, SHAMROCKS, AND THISTLES

Place the numbers I to 12 (one number in every design) so that they shall add up to the same sum in the following seven different ways-viz., each of the two center columns, each of the two central rows, the four roses together, the four shamrocks together, and the four thistles together.



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