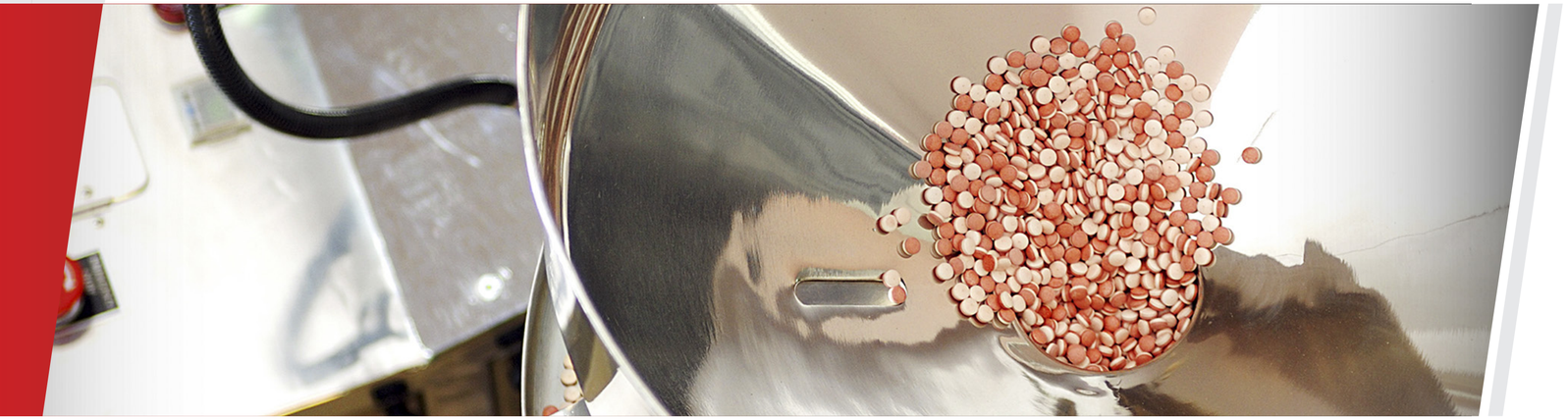
SCANTECH LASER

SOLUTIONS FOR PHARMA

Welcome
to our catalog

We serve our customers, our colleagues and our communities by integrating sustainability into our work every day. We believe it's not just the right thing to do, but it's also good business.

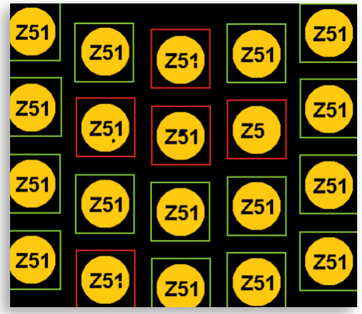


Overview - Applications

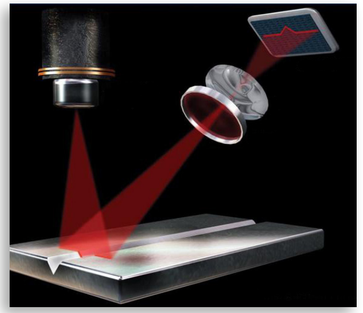
Soft Gel Laser Printing

Paper Box Laser Batch Coding

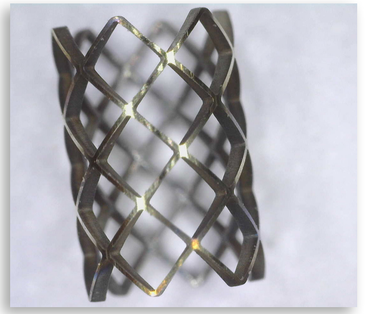
Glass Vial QR Code Marking



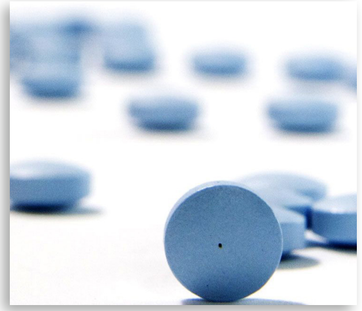
Tablet Inspection



Tablet Surface Laser Inspection



Stent Laser Cutting



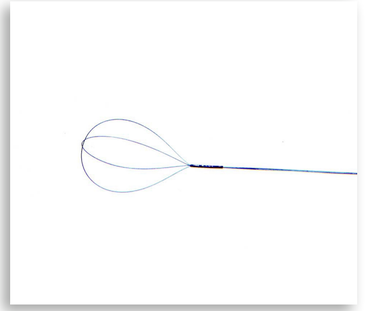
Tablet Laser Drilling

Glass Bottle Laser Marking

Blister Batch Coding

Plastic Container Laser Marking

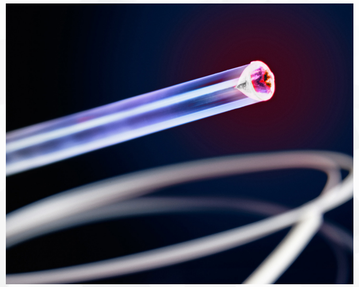
Tablet Laser Printing



Nitinol Basket Laser Welding

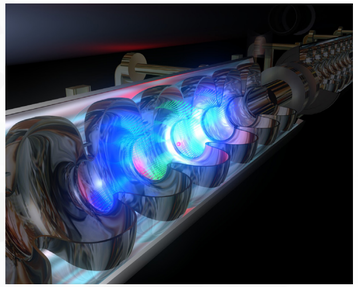
Laser Technology

Fiber Laser



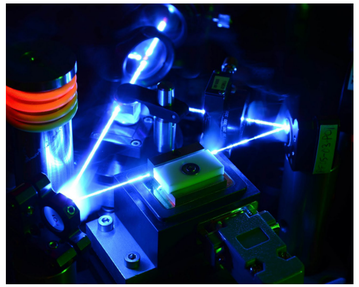
Belonging to the solid state laser group, they generate a laser beam using seed laser and amplifying it in specially designed glass fibers, which are supplied with energy via pump diodes. Suited for Metals & Coated Metals.

CO_2 Laser

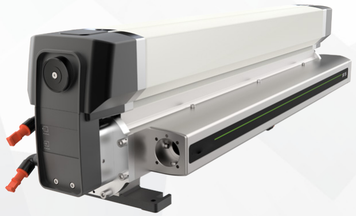


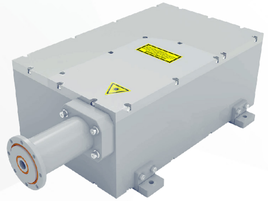
These are gas lasers based on a carbon dioxide gas mixture, which is stimulated electrically. CO_2 lasers have a very good beam quality and offer a relatively high efficiency. Suited for the Metals, Wood, Acrylic, Glass, Paper, Textiles, Plastics, Foils & Films, Leather.

UV Laser



UV laser is a colder wavelength compared to other wavelength which reduces overheating while processing as its absorption ratio on material is higher even at lesser power using small pulses at high repetation rate.





Fiber Laser

A fiber laser is a laser in which the dynamic increase medium is an optical fiber doped with uncommon earth components, for example, erbium, ytterbium, neodymium, dysprosium, praseodymium, thulium and holmium. They are identified with doped fiber amplifiers, which give light amplification without lasing.

Fiber lasers are packed small and robust, alignment is always intact, and effectively deplete thermal energy. They come in many variants, offering innovation to other kind of lasers yet giving their own particular novel preferences. The fiber-based laser design is highly adaptable.

Fiber Laser Types

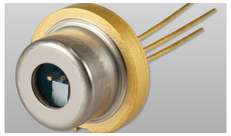
Single Mode: High intensity beam on a small focused spot diameter of below 20 microns gives precise high quality cutting and marking.

Multi-Mode: Low intensity beam on a large focused spot size diameter of more than 25 microns gives less accuracy and quality for cutting and marking applications.

Q-switched Fiber Laser: A Q-switched fiber laser emits high-intensity pulsed output beam light of high peak power energy concentrated into very powerful nanosecond short pulses. In pulsed lasers by the Q-switched technique to get stable and regular short pulses in the nanoseconds range.

Mode Locked Fiber Laser: A Mode Locked fiber Laser can use this technique to produce ultra-short optical light pulses of very short duration.

Quasi Continuous Wave Fiber Laser: QCW is Continuous Wave mode of Fiber Laser and in this mode it generates high peak power which is 10times more than average power. It shows that this single Laser can fulfill the both application of Pulsed and CW mode. Due to less duty cycle it overcomes the effect of Thermal Lensing or Overheating.



Laser Diode

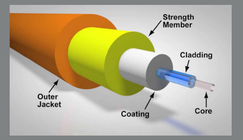
It is a semiconductor device similar to a light-emitting diode in which the laser beam is created at the diode's junction. Laser diodes are the most common type of lasers produced, with a wide range of uses that includes laser light beam illumination.

Photons Generation

The excited photons that are emitted from the laser diodes are created in and sent down a fiber cable. The fiber laser uses an optical fiber, somewhat similar to fiber optic lines used in telecommunications, to create and transfer the photons (light).

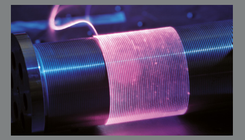
Fiber Flexibility

To completely utilize the flexibility of fiber lasers, a laser with a permanently built in feeding fiber of a certain core diameter*, starting from 50 microns. The core diameter of the feeding fiber places the limit on the maximum brightness provided by the laser.



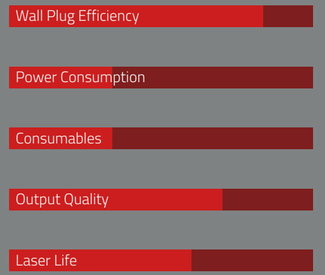
Fiber Construction

It starts with core where laser is traveled and the cladding helps to multiply the photons and further coating helps strengthen the fiber and further protected against general wear and tear.



Fiber Optic

Fiber Core is made from drawing glass. Diameter of fiber ranges from 10 µm to 2000 µm. Light is kept in the core by the phenomenon of total internal reflection which causes the fiber to act as a waveguide.



Advantages

- Phenomenal Beam Parameter Product (BPP)
- Steady BPP Over Entire Power Range
- Higher Wall-Plug Efficiency
- Maintenance Free Operation
- Easy 'Plug and Play' Design
- Higher Diode MTBF Life
- Allows Processing of Highly Reflective Materials
- High Photon Conversion Efficiency
- Alignment Free Operations

CO_2 Laser

Carbon dioxide lasers are gas lasers which discharge infrared radiation. They are utilized for an assortment of high power modern applications. All lasers comprise of three segments: energy source (otherwise called a pump), a laser medium, and an optical resonator. The pump serves to give energy which is amplified by the laser medium. This energy is transformed into light and is reflected through the optical resonator which then discharges the laser beam.

All gas lasers depend on the excitation of gases to amplify energy. Carbon dioxide lasers specifically are contained the accompanying components; Electrical current, A blend of gases, A particular optical resonator.

CO_2 Laser Types

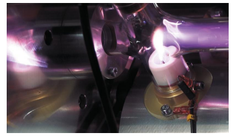
Flowing Gas CO_2 Laser: When CO_2 laser was constructed, Flowing Gas CO_2 Lasers was the first case. This is not sealed tube it requires an dynamic pumping system and gas supply to work. This is mainly used in high power lasers.

Q-Switched CO_2 Laser: It is a method by which a laser can be made to deliver a pulsed output beam. The procedure permits the generation of pulses with extremely high peak power, it would be much higher than delivered by a similar laser working in CW mode. Generated pulse width is very short i.e. Nanosecond Laser.

Mode Locked CO_2 Laser: A technique to produce an ultra-short pulsed output beam by equalizing the mode of waves. Pulses last for a much shorter time i.e. Femtosecond (10-15 Sec) or Picoseconds (10-12 Sec) Laser.

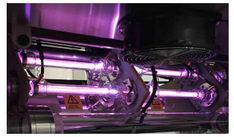
DC Excited CO_2 Laser: DC excited CO_2 Laser is made of Glass tube with blend of carbon dioxide, helium, nitrogen, hydrogen and xenon where electrical energy is passes through, resulting in a direct electrical discharge.

RF Excited CO_2 Laser: RF Lasers are encompassed in Metal housing where the CO_2 laser is excited using radio frequency resulting in better beam quality. RF Excited CO_2 Lasers is encompassed in Metal tubes. RF excited CO_2 Lasers generates pulses at extremely high repetitive rate and produces smaller beam spot which results in high quality output. Life cycle of RF Lasers is 4-5 times better than DC Excited Lasers.



Laser Excitation

Collisional energy transfer between the nitrogen and the carbon dioxide molecule causes vibrational excitation of the carbon dioxide, with sufficient efficiency to lead to the desired population inversion necessary for laser operation.

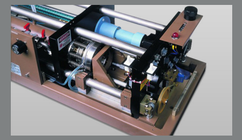


Laser Resonance

Excited CO_2 molecules between two mirrors in a resonant cavity can amplify any electromagnetic wave of the wavelength associated with the vibrational-rotational-bending energy transition of the carbon dioxide molecules.

Laser Construction

The physical design of a CO_2 laser consists of a gas filled tube sand wedged between a pair of mirrors, this tube is excited by a RF or DC electrical discharge. Contrary to popular belief CO_2 is not the only gas apparent inside these tubes.

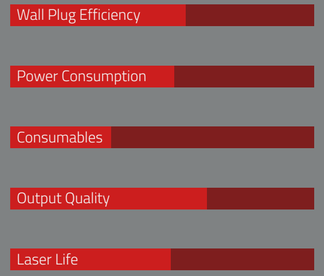


Gas Flow Construction

Gas flows across the tube as apposed to down the length of the tube, this ensure a fresh mixture along the entire length of the tube. Typical power outputs of 10kW per meter can be achieved with similar arrangement.

Sealed Off Construction

Similar to sealed HeNe lasers but with dimensions tuned to CO_2 excitation wavelength. A Sealed tube design are DC excited, power control is achieved with pulse width modulation. Typical power ranges up to 1kW.



Advantages

- Excellent Edge Finish Compare to Any Laser
- Can Cut Non-Metal Materials - Plastic, Wood etc..
- Simple Construction
- On Site Repairable
- Easy Alignment Process
- Long Life for Gas Flow Lasers
- High Absorbing Wavelength
- Highly Energy Efficient Compared to Plasma
- Recipe Based Software for Easy Operations

UV Laser

UV Laser wavelength ranges from 235 nm to 400 nm. Diode, DPSS or Nd:YAG laser are the commonly used laser to generate 1064 nm wavelength, it is than converted to Ultra Violet wavelength through third harmonic generator. It features precise temperature controller which is one of the critical part of UV laser. UV laser is colder wavelength compared to other wavelength which reduces overheating while processing as its absorption ratio on material is higher even at lesser power.

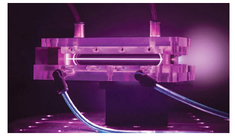
UV Laser is highly used in Holographic, Bioengineering, Photo Lithography, Tablet Printing, Fine Marking on Plastics & Metals, Nitinol Cutting and several other micro processing applications.

UV Laser Types

Diode Pumped Solid State Laser: The first is a diode-pumped solid-state laser (DPSS) Nd: YAG Q-Switch, in which duplication crystals are used to change the infrared wavelength of 1064 nm and switch it to the wavelength of the ultraviolet of 355 nm. The shape of the ray is Gaussian, so the spot will be round and with the intensity of energy gradually decreasing from the center towards the edge. The beam can be focused on spots of the order of 10 µm. The high repetition speed of the operation and the very small area on which they operate make these lasers the most suitable for micromachining.

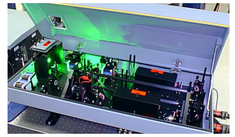
Excimer Laser: The wavelength of this laser depends on the type of gas mixture used and ranges from 180nm to over 300nm. The generated ray is not round, but has a rectangular shape with a more or less constant intensity distribution. Masks can be used to generate specific spot geometries.

Metallic Vapor Laser: The copper vapor laser is the most frequently used although vapors of many other metals can also be used. Copper vapor lasers generate radiation at a wavelength of 511 nm and 578 nm. The shape of the beam is Gaussian, which makes the laser suitable for the same range of applications as the solid-state ultraviolet laser.



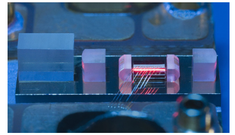
Laser Pump

The process of transferring the energy from an external source into the gain medium of Laser is called Laser Pumping. Once energy is gained by the Gain medium, it starts produce excited states in its atoms.



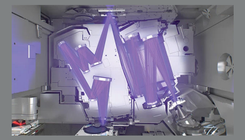
Wavelength Transformation

When standard Laser with wavelength 1064 nm is passed through a non-linear crystal, its wavelength reduces to 532 and in same way further to 355nm. That is the reason UV Laser is called third-harmonic generation Laser.



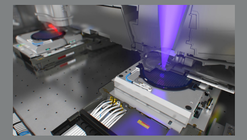
Laser Setup

UV Laser is comprised of a blue pump diode, a praseodymium crystal, another crystal for second-harmonic generation (SHG), and a cavity output mirror. It can be installed in hand-held or stand-alone system.



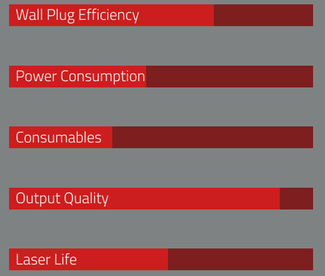
Beam Expansion

Beam Expansion minimizes the divergence of Laser beam and decrease the laser power density which reduce the risk of damaging the coatings and optical materials of optical components.



Finer Spot

High beam quality produces the finer spot and a greater depth of focus. Spot size of the beam means the smallest diameter which is spotted at focus plane of lens.



Advantages

- Higher Signal-to-Noise Ratio (SNR)
- Increased Scattered Power at Shorter Wavelength
- Triple Frequency to 1064 nm
- Higher Absorption Rate
- Cold Laser Wavelength
- Wide Range of Material Supported for Processing
- Allows Processing of Highly Reflective Materials
- Lower Power Required than Other Wavelengths
- Extremely Small Spot with High Frequency

Overview - Tablet Laser Printing

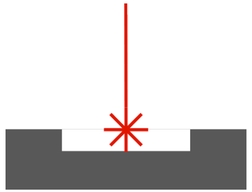
The continually changing scene of assembling pharmaceuticals requires instruments that are dynamic and simple to use. Machines for printing tablets and capsules need to acclimate to numerous shapes and sizes, and be equipped for changing data rapidly, all lessening downtime underway.

It's additionally vital to deliver at high speed with reduced rejection rate. The Laser Printing System does not use any kind of ink or consumables which gives an advantage of running cost reduction and overcomes the quality problem by ink printing like temporary marking, ink smudges, broken lettering, smear etc. It does not need any regular care like Ink printing system. Ink printing can spread, requires contact with the tablet which results in high maintenance cost. Considering difficulties, Laser Printing System was introduced with benefits from counterfeiting.

Laser Printing System imprints the desired contents on the various kind of Softgels, Tablet, Gelatin capsules and hard capsules etc. This lead a non-contact process where printing head keeps on certain distance from the object to be printed. Tablet Printing Laser System maintains high printing quality due to very small laser spot of 100-500 µm which allows extremely sharp and crisp characters. This System consists of additional inspection system so that defective tablets due to appearance or print can be rejected.

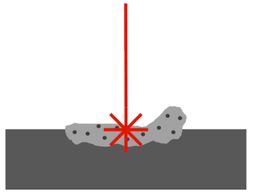
Laser Printing System can process one or two-sided on one or two colors, high or low output Capsules or Tablets. It is capable of changing multiple sizes and shapes and alter the printing data rapidly.

Laser Printing Technology



Ablation Process

The ablation process requires material to be removed from the surface creating a depression. The laser beam penetrates the material and marked area creating a visual depth. Since the material is heated and reacts with air a slight discoloration at the engraved areas is visible. This procedure is used to make dies, stamp dies, metal monogram, coin minting die, or for texturing purpose. It removes the material in multiple passes to maintain sharpness.

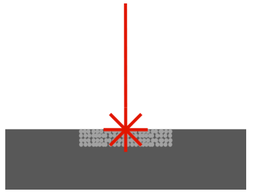


Melting Process

Laser melting or foaming process is mainly used for creating optical effects where the processed material appears lighter than the surrounding component. Laser is directed at dark plastics to create gas bubbles. These bubbles then are cooled and embedded in the material hence raised from the actual surface level which reflect light differently then the surrounding. This process is used for Animal tag marking, ID card marking or high precision texturing.

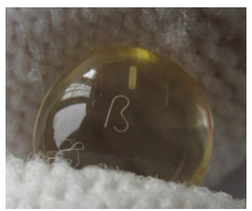
Annealing Process

Annealing is a process of creating an oxidized layer on ferrous metals through localized heating. The material surface remains even during the process as no layer is added or removed from the surface. The color of the oxidized surface depends on temperature at which the layers are heated. This technique produces high contrast and dark marking output. Specifically material like stainless steel, chrome & titanium are highly used for this technique.



Coloring Process

Localized heating of materials slowly which creates annealing effect. Different colors are produced using thermo chemical reaction by heating with different temperature, thus produces colors. The surface is reacts to material properties and oxidize. Color marking is gaining interest in the industry as it adds visual appeal to the end product. In case of Non-Metals it uses the base material properties like TiO_2 and creates a photochemical reaction which results in color.



Fundamentals of Laser Printing

UV Laser

At the point when UV laser is exposed to titanium dioxide on the tablet surface it eliminates oxygen atoms which results in uneven ratio of Ti & O. When oxygen atom is removed, grey color is produced as the proportion has maximum of titanium left on the laser exposed surface which leave extremely fine marking on the tablet. Ref. Image 1

Tablet Coating

Being UV as cold laser, its exposure to tablet coating is very tender impact and affects no other layer other than surface. The selection of parameters helps in producing optimal print quality without affecting the coating layer. Ref. Image 2 & 3

CO_2 Laser

CO_2 Laser is commonly used for processing transparent materials such as PP Films, Acrylic, Glass along with various other material types. On exposure of CO_2 Laser beam irradiates the layer thickness and converts the irradiated material to smoke which results in caving of surface coating and creates a contrast on the transparent materials. Ref. Image 5

Tablet Coating

CO_2 Laser beam when exposed to the surface of gelatin coating, the water in the coating evaporates and create bubbles and it generates frosting effect on the coating surface. It is somewhat like the laser ablation method which removes some amount of coating thickness. Ref. Image 4

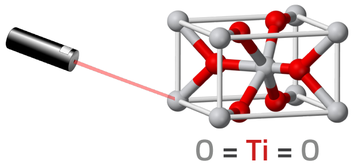


Image 1

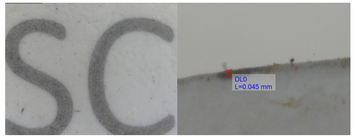


Image 2

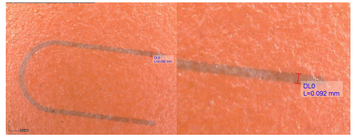


Image 3

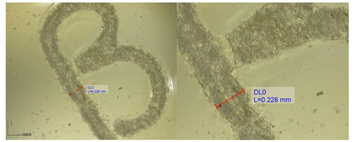


Image 4

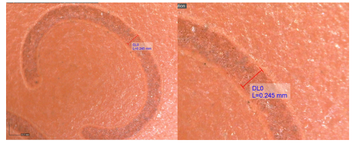


Image 5

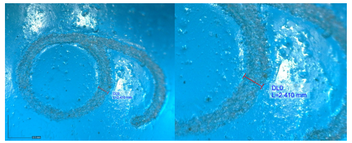
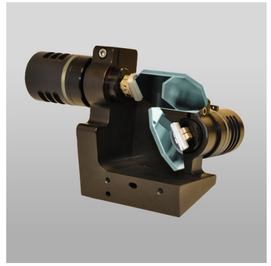


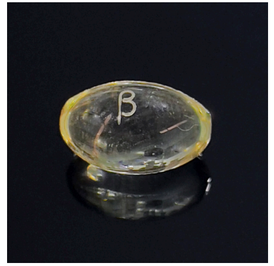
Image 6

Advantages of Laser Printing

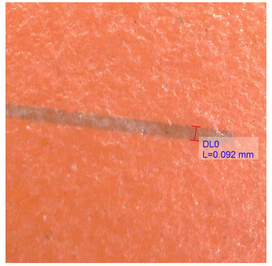
Non-Contact Table Printing Process



High Precision & High Speed Printing



Print on Curved Surface



Very High Resolution

Customize Content to Any Shape & Text

High Speed to Boost Productivity

Serialize Printing Data Changeover

Less Cleaning Cycles

Comparison of Printing Technology

Laser Printing

- No Consumables
- Lower Processing Cost
- High Reliability
- Permanent Mark
- Tamper Proof
- Non-Invasive Process
- Easy sync with existing production line
- Fast turnaround time
- Better Traceability
- Extremely Safe

Laser Vs Ink Printing

1. No printing material additives to validate and maintain quality control
2. The usual problems associated with ink printing are avoided, such as character loss, blurring, smudging and splatters
3. Avoids potential spillages of the ink medium
4. Avoids problems associated with the room environment such as temperature and humidity
5. No additional supply chain and storage requirements

Laser Vs Tablet Embossing

1. No Restriction for modification of data
2. Better for common tooling across similar sizes of different molecules
3. Significantly more information can be marked onto the tablet, including QR codes and branding
4. Remove common tableting problems associated with tablet embossing, allowing tableting speed to be increased and output improved
5. Remove common coating problems associated with embossed tablets

Overview - Tablet Laser Drilling

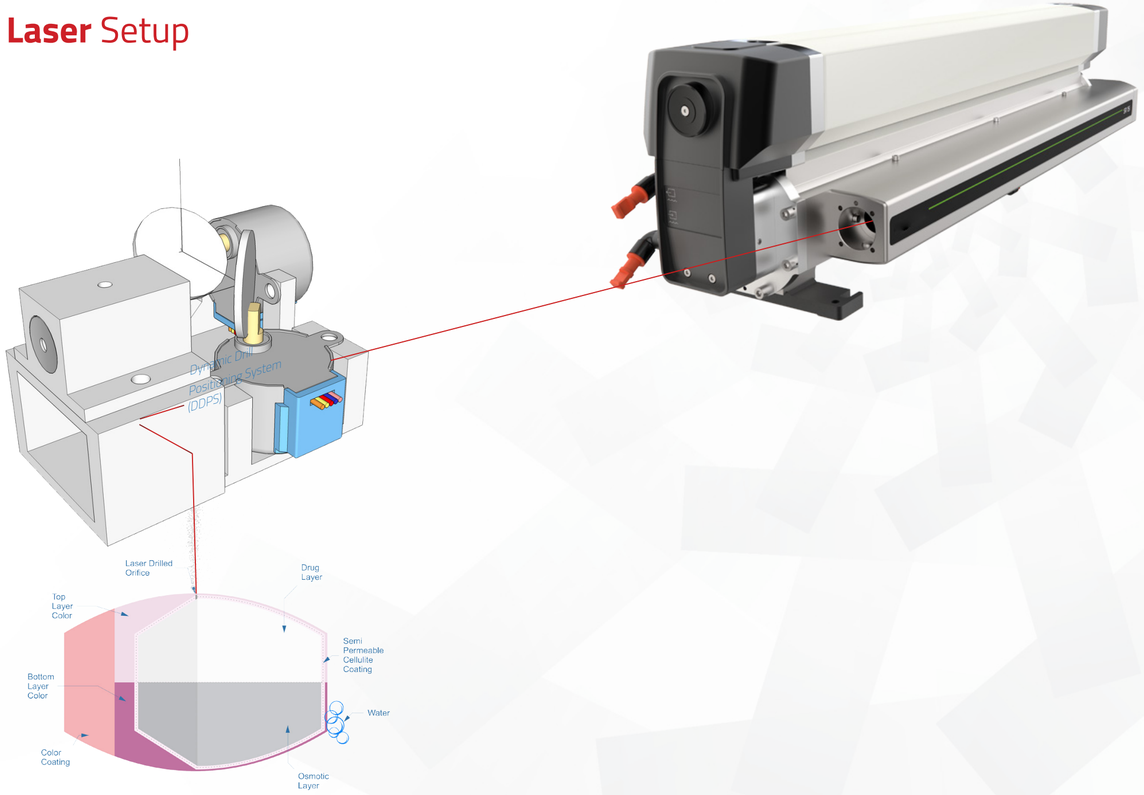
When it comes to drilling of blind and through holes laser technology offers the benefits of high flexibility and speed. By choosing an appropriate wavelength and power density of the laser beam, it is practically possible to laser drill all solid materials including metals, semiconductors, plastics, ceramics and even diamonds.

Drilling tablets with Laser is most economical and accurate method. The advantages of OROS drug release is well demonstrated like consistency in drug delivery, reduced dosage numbers, reducing side effects. OROS drug delivery system has proved importance for controlling medication delivery. Laser Drilling is advanced technology for Osmotic controlled-release oral delivery of drug also known as sustained-release (SR), extended drug release or controlled drug release.

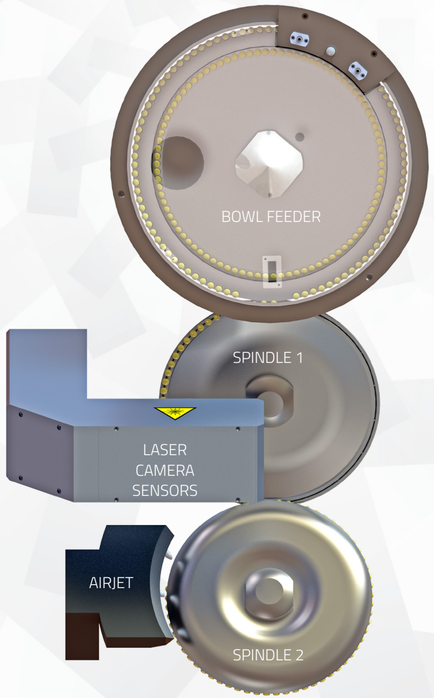
Scantech has developed an exceptional Laser System to drill a hole in tablet at extremely high speed with high accuracy. It features various modes like Manual, Semi-Automatic and Fully Automatic trouble-free operation with capability of producing hole size from 0.2 mm to 2 mm. Visual inspection at high speed measures the tablet at great accuracy and eliminates flaws in the processed tablet. Tablet drilling machine standards complies CE & CFR21. Machine ranges from batch submission to high production capability with quick changeover for multiple products and accurate whole size as per the requirement helps to release the drug by OSMOSIS Technology. Laser technique is highly preferable over mechanical technique as the quality of drill and the production speed mechanically is impossible to match.

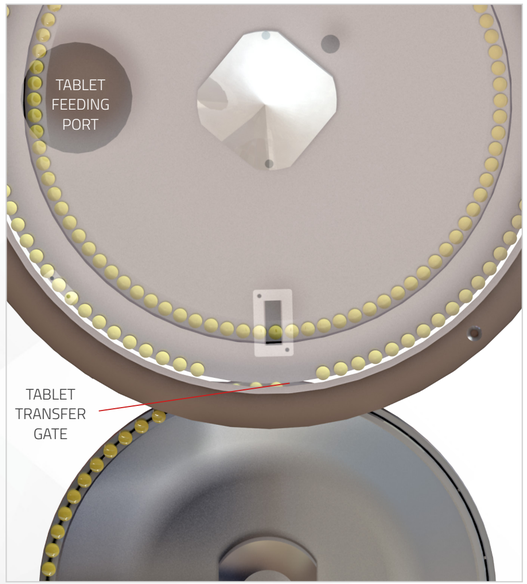
Scantech with its inception is involved in various laser technology took challenge of making tablet drilling laser system for sustain release of drug in the year 2004, since than we have not looked back and now Scantech is Pharmaceutical Industry's preferred choice for Tablet Drilling Laser System worldwide.

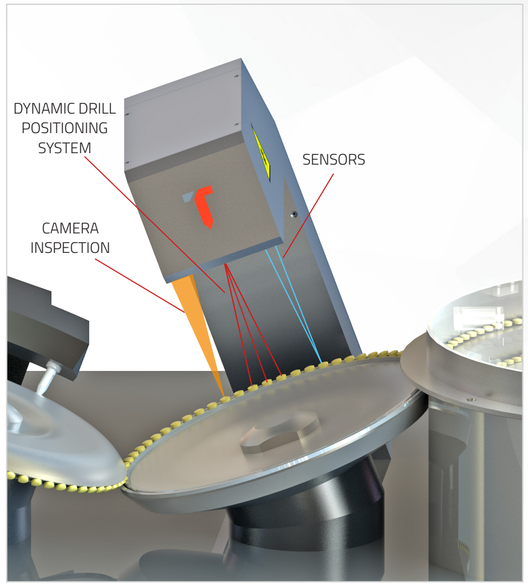
Laser Setup

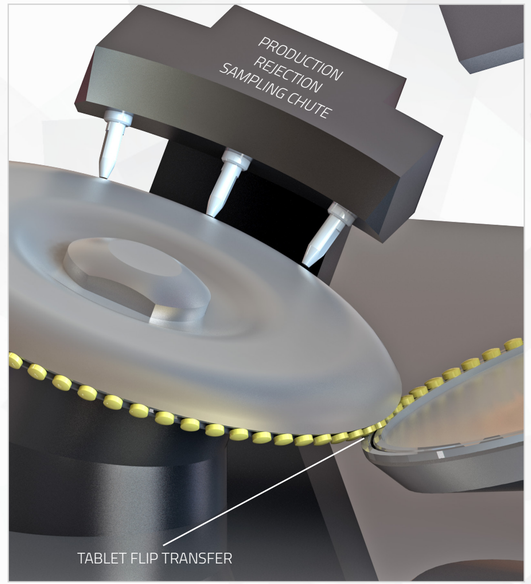


Machine Overview

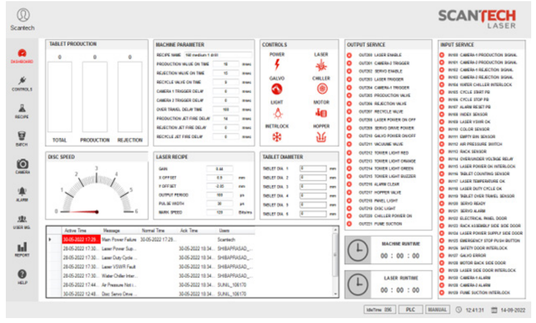








iScada Software

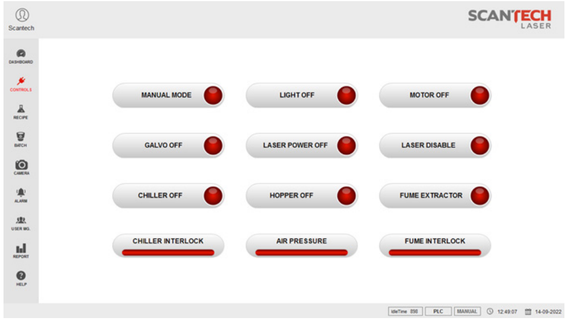


Dashboard Interface

Features:

This screen shows the status of different I/O's as well as some other parameter status like machine runtime, laser runtime, laser recipe parameters , disc speed , active user log ,Tablet Diameter, Tablet Production , etc.

This screen gives the user an interface to have an idea what is going on in the runtime mode of the machine.

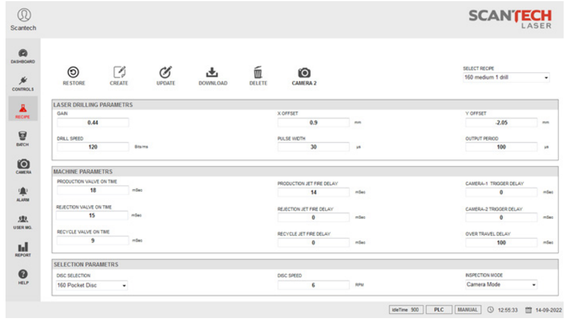


Control Interface

Features:

This screen contains different switches like laser control, motor control, galvo control, hopper control, chiller control etc., which gives user an easy interface to operate machine controls.

Also the screen contains different interlocks level whose runtime value is shown in term of graphics like chiller interlock, air pressure, and fume interlock, through which user can easily understand which interlock is active right now at the time of machine run.



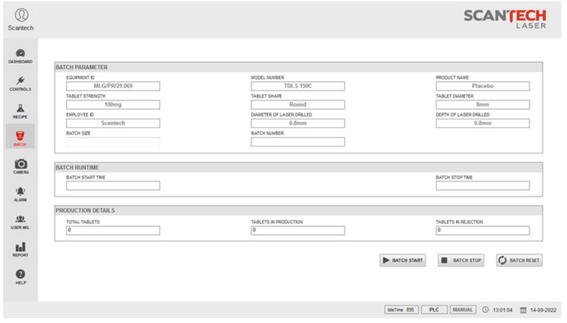
Recipe Interface

Features:

In the recipe screen we have a drop down menu name select recipe through which user will be able to select the recipe which was created earlier.

Also there are other buttons like restore/update /download/delete, with the use of these buttons user can create recipe , update it ,download it as well as delete it .

There are different parameter section in the screen with different parameters like Laser Drilling Parameters / Machine Parameters/Selection Parameters, each set of parameter contains different fields so whenever user creates a recipe these were saved automatically to the database and when user restore the recipe these fields restored automatically.



Batch Detail Screen

Features:

In this screen user create the batch, there are different sections named as batch parameters/ batch runtime / production details. User have to fill the batch parameter section details while preparing machine for a new batch run.

The screen also contains three buttons named Batch start / Batch Stop / Batch Reset, these controls were used in controlling the batch whenever user want to start or stop or reset the batch.

Note: The software features mentioned are reference for tablet drilling system. The company reserves its right to change, add or delete any of the mentioned specification without any prior notice.
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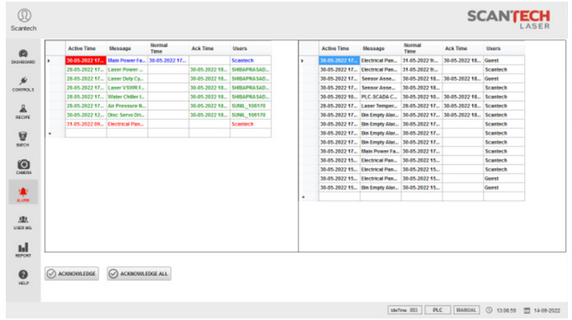
eScada Software

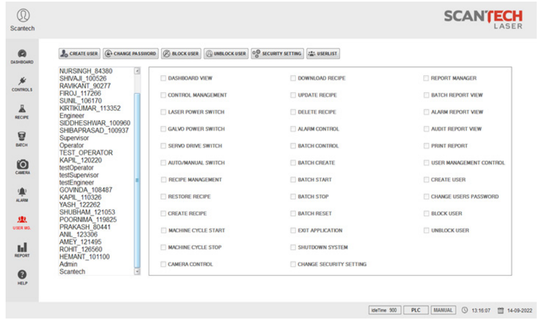


Alarm Screen

Features:

This screen shows the list of active alarms in the machine also there are two buttons given to the user in the screen so that user can be able to acknowledge the alarms individually or at all-in-one click.

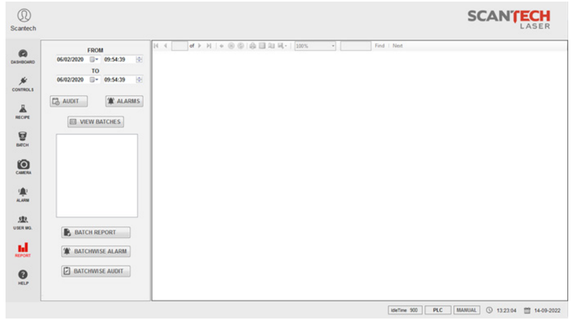
Next to it there is another panel which shows the list of already acknowledged alarms, so the interface let the user to have a complete idea of the alarms and the action that which one was acknowledged earlier, and which is active at the runtime in the single screen.



User Management Interface

Features

This screen gives the user an interface to do the settings in terms of user management like user can be able to create new user ,change current pass-word, block user, unblock user , can modify security settings, can be able to see the present user list.



Report Generation Screen

Features:

This screen gives user to view different reports like Audit Report/Alarm Report / Batch Report / Batchwise Alarm Report / Batch wise Audit Report, the screen contains the features through which user can be able to differentiate reports on the basis of date and time.

The selected reports will be shown in the left side of navigation report panel.

Help

Features:

This screen provides the operator and maintenance team with easy access to manuals, procedures, and documents directly from the SCADA screen. It stream-lines the process of accessing maintenance procedures, circuit diagrams, and other relevant documentation.

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Office

On behalf of our staff, we welcome you to our office. We are pleased that you have shown interest in us to care for your needs and we look forward to your visit. We want you to know that we are committed to provide you with the highest quality of service in the most gentle, efficient, and enthusiastic manner possible. We pride ourselves on making sample trials a pleasant experience for you, while providing you with the best solutions.

Should you have any questions about our practice, services, or policies please do not hesitate to contact our office or visit our website at www.scantechlaser.com. Our other product information are available on our website. We look forward to your visit.

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