SPI Lasers

01489 779 696
www.spilasers.com

VERSATILITY COMES AS STANDARD

SPI LASERS BY APPLICATION

In this infographic we explore eight of the applications of SPI Fiber Lasers, perfectly showcasing their impressive versatility; these are – ablation, additive manufacturing, cleaning, cutting, drilling, engraving, marking and welding. These are not the only applications of SPI Lasers, but it will give readers an idea of their versatility.

ABLATION

The process of laser ablation involves the precision removal of layers of solid metals and various other materials. The most common use of ablation is to remove materials with a Fiber Laser pulse, but a continuous wave laser can also be used with high laser beam intensity levels.

Benefits

There are many benefits of laser ablation including low heat output, absolute accuracy and precision and lack of disturbance to surrounding materials (e.g. glass, metals, plastics or silicon).

Applications

Laser ablation in manufacturing is being used in the electronic semi-conductor industry and with microprocessors. Particularly popular uses are for liquid crystal displays, plasma displays, solar cells and touch sensitive panels. Designs are kept secret to prevent copyright infringements. Laser ablation is widely used in thin film removal (the low heat avoids damage to the underlying metal) and is also ideal for etching precious metals onto ceramics. Laser ablation can also be used in medical procedures such as unsightly vein removal.

ADDITIVE MANUFACTURING

Additive manufacturing (often also referred to as 3D printing) starts with a 3D CAD software design which is an intricate digital blueprint for the work the laser will need to complete. The laser will apply/print material (e.g. metal powder) in super-fine layers to the design of the CAD drawing. Through this process of "addition" the finished product will eventually be created "layer by layer".

Benefits

Benefits of additive manufacturing include complete freedom of design which provides the complete ability to design complex and unusual shapes. One-offs and prototypes can easily be produced. Parts produced using additive manufacturing are typically strengthened as they avoid welds used in traditional manufacturing. There is a green message too as additive manufacturing produces less waste of raw materials.

Additive manufacturing can be used with a wide variety of materials, such as chocolate, glass, metals (e.g. gold, silver, stainless steel, steel and Titanium).

Applications

Additive manufacturing includes parts/components manufacture and the repair/manufacture of tooling. Rapid prototyping – the production of proof of concepts and one-off designs are also popular. The technique is used in the medical field (e.g. printing of blood vessels, body parts, soft tissue, stem cells, etc.) There are so many applications of additive manufacturing; it is too much to scope the full extent in this infographic.

CLEANING

Laser cleaning as the name suggests involves the use of lasers in the cleaning of surface debris and other layers of contamination without causing damage to the surrounding required materials.

Benefits

Fiber Lasers from SPI Lasers avoid damage to surrounding materials, which other laser types (e.g. Gaussian) can cause. The cleaning process is extremely precise, contactless and avoids any mechanical input. This process is chemically free (which is great for the environment) and less abrasive than traditional techniques.

Applications

Laser cleaning is useful in the cleaning of mould tools, which attract debris and contamination over a period of time. Laser cleaning can also be used to clean print rolls, remove oil and grease, to descale metal sheets and also to clean larger objects such as bridges and aircraft, etc

CUTTING

Laser cutting involves the use of a laser to cut a wide variety of materials, e.g. metals, plastics, etc. The strength of the laser beam can be varied to suit the thickness and characteristics of the material being cut.

Benefits

SPI Fiber Lasers enable high speed and highly efficient pinpoint accuracy cutting of a variety of materials. Cutting is completed at lower cost with lower power usage in what is an ultra-fast and higher quality process. Various material thickness levels can be cut all the way from micro machining through to thick cutting.

Applications

There is a massive variety of applications for laser cutting, examples include metal sheet cutting, tube cutting, hydro form and body cutting. Tasks such as micro machining can be delivered; reflective materials can be used as well as the cutting of complex designs and items such as electronic stencils and stents for use in the medical industry.

Materials cut include ceramics, gemstones, graphic composites, metals, pewter, plastics, silicon and precious metals in the jewellery industry (e.g. gold and silver), etc.

DRILLING

Laser drilling is simply the use of laser technology to create a laser beam which drills holes in a wide range of materials, SPI Fiber Lasers are ideal for laser drilling usage. The laser drilling process will vary considerably depending on the material thickness and the amount of holes which need to be drilled.

Benefits

There are many benefits to laser drilling, these include drilling at steep angles and the ability to work with difficult to machine materials. The production of complex shapes and very small items is also made possible. The process is entirely non-contact and produces very accurate and high quality results.

Applications

Drilling applications include the manufacture of injection nozzles, drilling ventilation and cooling holes (e.g. in turbines) and in the production of filters – the list of potential applications for drilling is potentially unlimited. Drilling can be applied to a variety of materials including ceramics, graphite composites, metals (including coated metals), plastics, etc.

ENGRAVING

Engraving is a very popular application for SPI Fiber Lasers. The depth of engraving varies according to the material used and the power and duration of the laser beam. Laser engraving is effectively using a laser beam to perform the same operation as a chisel would complete manually.

Benefits

There are many benefits associated with laser engraving, a fundamental one being the lack of physical contact between the laser and the subject. Lasers offer precision engraving and are perfectly capable of completing even the most complex of design patterns. Fiber Lasers in particular offer benefits over other laser types, particularly with deeper engraving due to the levels of control which can be exercised.

Applications

Typically there are two main types of engraving, light (between 5μm and 25μm) and deep. Metal is frequently used for engraving; example metals used include aluminium alloys, pewter, silver, stainless steel and tool steel.

MARKING

Laser marking gives the opportunity to mark a variety of materials in black and white or colour. Operating at very high speed, SPI Fiber Lasers can accurately mark in an almost unlimited number of ways.

Benefits

Buy an SPI Fiber Laser for its versatility including marking. A Fiber Laser process that is extremely cost effective, produces high quality results in a simple to manage process. Laser marking is a very efficient and fast process that offers a high degree of control and can easily be incorporated into other manufacturing processes (e.g. cutting, welding, etc.)

Applications

There are a vast number of applications for Fiber Laser marking. Examples of marking include the addition of a barcode/QR code or a hallmark on a piece of jewellery.

Marking can be used to add a dark contrast on a light background (or vice versa – light mark on a dark background), or used in night and day marking e.g. a sign, which must be readable 24 hours a day) or a number of colours can also be marked. Marking is particularly prevalent in the marking of PCB boards, the list of marking uses is vast and this infographic only scratches the surface!

Marking can be applied to plastics, metals, ceramics and a variety of other materials – any manufacturing material can be marked.

WELDING

Welding is another application that can be applied and is irrespective of the material or its thickness. Laser welding has already replaced many human welding tasks, which require a high level of skill and are more prone to error.

Benefits

Laser welding has many benefits but perhaps amongst the most important is precision, which is important with all welding but is made easy with SPI Fiber Lasers. Laser welding allows precision welding to less than 0.1mm thickness as well as the creation of complex joins and absolute consistency which is difficult to achieve using traditional techniques. Laser welding creates stronger joins which are error-free and even allows for dissimilar metals to be welded together. The lower levels of heat of Fiber Laser welding cause less (if any) disturbance to surrounding materials, which is difficult to avoid traditionally.

Applications

Fiber Laser welding can be used on a large variety of applications but is especially used in high-volume welding tasks where quality and consistency are vital even when hundreds of units are produced. All kinds of materials can be welded including various metals (even dissimilar ones) and plastics. Laser welding is actively used in fuel cells, batteries, fine wire creation (e.g. in medical devices) and in welding precious metals such as sterling silver in the jewellery industry.

WITH SPI LASERS – "VERSATILITY COMES AS STANDARD"

In conclusion it's worth us mentioning that with SPI Lasers "versatility comes as standard". It's our Company Mantra and something we believe passionately about. We are sure you can see from the range of applications our Fiber Lasers serve that they really do offer incredible levels of versatility.

SPI Lasers

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To discover just how versatile our Fiber Lasers can be, and how they could benefit your business call us on **01489 779 696**