

Welding | Cutting | Drilling



JK™
Lasers

Lasers for Industry



GSI

Part of the GSI Group

™



JK™
Lasers



Rugby, UK



Bedford, USA



Suzhou, China

For over thirty years, JK™ Lasers, part of the GSI Group, has provided innovative industrial lasers and laser processing solutions for the Medical Device, Aerospace, Automotive, Electronic and Semiconductor industries.

Based in Rugby, England, JK™ Lasers manufacture and supply a range of world-class Fiber and Nd:YAG lasers, which can be offered to industrial integrators as manufacturing process tools and to OEMs for integration into systems.

With decades of industry knowledge combined with an extensive portfolio, JK™ Lasers can help manufacturers to choose the most suitable laser solution for their specific cutting, welding and drilling requirements.



Product Range

The range of industrial products from JK™ Lasers has been developed to operate 24/7 in the most demanding environments. Using over three decades experience in industrial laser processing, JK™ Lasers has developed a range of solid state and fiber laser products that continue to work year after year, with minimal maintenance and near zero downtime.



Fiber Lasers



Fiber lasers offer a new and exciting complementary technology to the world of industrial Lasers. JK™ Lasers has a strong tradition in bringing leading technology to the market whilst delivering products that are rugged, easy to integrate and optimised for industrial applications. The JK™ FL range of fiber lasers has been designed from the ground up to give industrial laser users the optimum solution for their applications.

CW Nd:YAG Lasers



CW Nd:YAG lasers are the established technology for the highest levels of shop floor reliability and ease of use for laser welding and cutting applications. The JK™ series of CW lasers can be supplied with the patented Luminator™ fiber delivery options and laser processing tools. These ensure safe and reliable 3D manipulation of the laser beam and high performance product interaction in the workpiece.

Pulsed Nd:YAG Lasers



Pulsed Nd:YAG lasers are ideally suited to challenging laser cutting, welding and drilling applications. Pulsed lasers are able to deliver small and precisely controlled amounts of energy to the workpiece, whilst achieving a minimal heat affected zone (HAZ) during micro-welding and cutting processes.

Process Tools



The JK™ Lasers range offers customers the combination of high power and a very flexible delivery system. The JK Luminator™ fiber provides dynamic, rugged and reliable beam delivery to the modular range of Luminator™ cutting, welding and drilling heads. The user can locate the laser remotely from the workstation and optimise the spot size, focus arrangements, gas options and viewing ancillaries.

Scan Head System



The JK™ Scan Head and associated Scan Head User Interface (SHUI) complements the range of JK™ fiber and Nd:YAG lasers. The scan head solution has been fully integrated into the LaserView™ SE and FiberView™ SE software, providing seamless programmability of the scan head and laser parameters through a single screen, allowing for precise cutting and welding.

Case Study

Flexure Arm

A disk drive flexure arm holds the ferrite reader that floats over the spinning magnetic media in a hard-disk drive.



How is it processed?

High speeds of positioning and the ultra-close proximity of the ferrite reader means that this component must be accurately assembled from 3 or 4 pieces of stainless steel ranging in thicknesses from 20µm ->200µm.

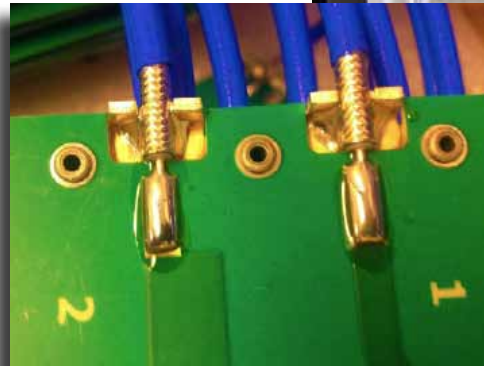
Pulsed lasers provide the discrete laser energy that is necessary to create each weld. The ability to produce pulse shapes for each weld location and relative thickness means that each weld is tailored to its target and the welding rate can reach over 150 welds/second.

For this application, high beam quality fiber delivered units are able to achieve the small weld diameters that are required. Inert gas can also be fed to the weld area to produce clean, smooth, oxide-free welds.



Electronic

Lasers can be seamlessly integrated into automated manufacturing systems, to create highly reliable welds at a rate that is demanded by the electronics industry. For batteries and devices with enhanced cell chemistries, the laser's ability to create robust seals delivers even more value.



Laser Welding

Welding | Cutting | Drilling



Aerospace

Welding aerospace components using traditional techniques can be a time consuming process, due to the intricate nature of the parts and the demand for a clean, cosmetic appearance. The products in the JK™ Lasers range can deliver multiple spot welds in a matter of seconds, focussing to a spot size diameter of $<100\mu\text{m}$ to create very strong joints.



Medical Device

Micro-welding using a JK™ fiber laser can produce the high strength, hermetic joints that are essential for many medical components. With safety and aesthetics of the utmost importance in this industry, the cleanliness and controllability of laser processing means that it offers an excellent replacement for conventional welding methods.



Automotive

Lasers can consistently produce the strong, seamless welds that are vital to ensure the operation and safety of many automotive parts. Products from the JK™ Lasers portfolio provide a suitable solution for this fast-paced industry, with typical weld times of less than a second achievable.

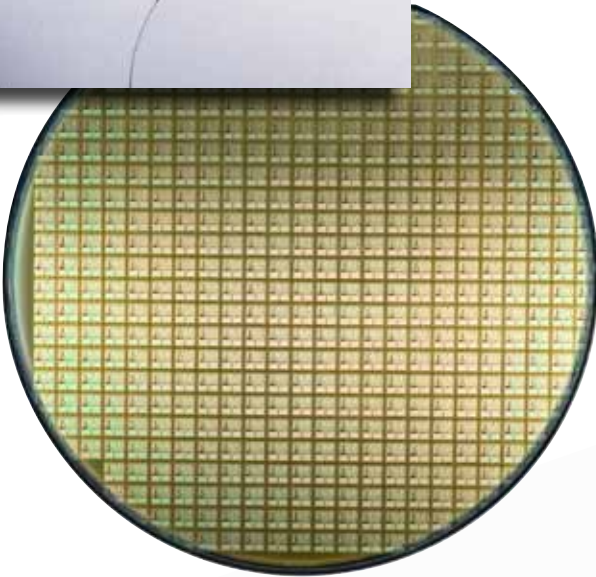
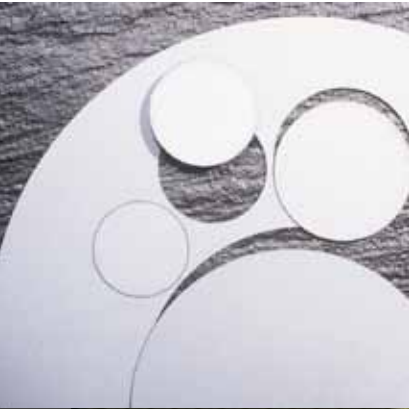


Laser Cutting

Welding | Cutting | Drilling

Semiconductor

The products from JK™ Lasers are capable of processing a range of materials of varying thicknesses, both faster and with smaller kerf widths. This means that they are able to match the primary requirements of the semiconductor sector - quick processing times with minimal cracking and heat affected zones (HAZ).



Medical Device

As fiber lasers are able to work in areas with a tolerance of only several microns, they are a suitable cutting tool for small medical devices. Using an industrial laser, manufacturers can achieve the clean, dross free cuts that are demanded by the industry, with smooth surface qualities and negligible heat affected zones (HAZ).



Automotive

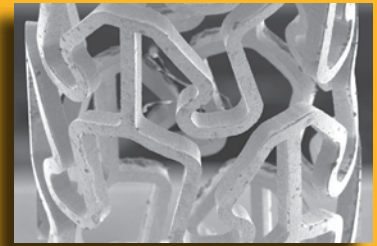
Due to the pace of the automotive industry, manufacturers require high quality aesthetic results in the shortest possible timescales. Unlike conventional cutting methods, lasers are faster, more economical and provide a quality cosmetic finish.





Case Study

What is a medical stent?



A stent is a medical device that is placed within a blood vessel or artery that has become weakened or blocked, providing stability to the structure and promoting the flow of blood.

How is it processed?

Stents are small devices with typical tube diameters of 1-100mm and wall thicknesses of approximately 100µm. For these cutting applications, lasers are an ideal solution as they can work in areas requiring a very small tolerance of only several microns.

For medical purposes, the laser cut must have a very good surface quality with no dross and a small kerf width. To achieve this manufacturers must choose a laser with a high beam quality and very good power stability.

With the JK™ fiber laser range, dross free cuts with 20µm width can be achieved with a very high contour accuracy of less than 5µm. Average cutting speeds for 0.5mm thick 316L stainless steel, with a single mode laser output are typically 0.5m/min.



Electronic

Lasers are capable of cutting complex shapes only a few microns in width, making them well suited to the intricate manufacturing processes required by the electronics industry. The JK™ series of industrial lasers can be integrated into systems to cut devices both quickly and with high reliability, allowing manufacturers to match the rapid throughput and aesthetic qualities demanded by the industry.

Aerospace

The JK™ Lasers portfolio of products can be used effectively to process aerospace components that have been designed to withstand high temperatures. The high standard of reliability, quick set-up times and reduced tooling costs mean that laser cutting makes economical sense in this industry.



Case Study

What is a gas turbine?

A gas turbine, as commonly found at the heart of an aeroplane jet engine, works most efficiently when operating at high temperatures, but these can exceed



the melting points of the materials. To overcome this, some of the cold air drawn off from the compressor stage, is fed into the hollow sections of turbine blades, combustor rings and nozzle guide vanes.

Many small, carefully shaped holes allow it to flow out over these surfaces, cooling and insulating them.

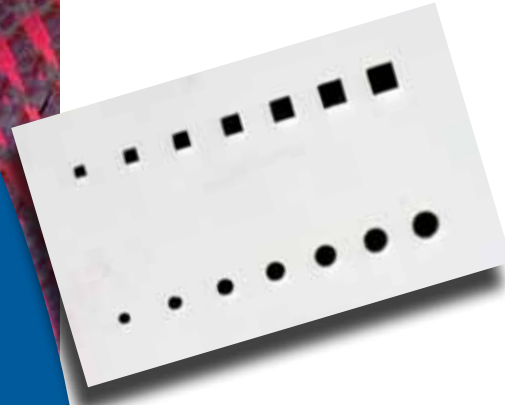
How is it processed?

These holes can best be drilled by a pulsed solid state laser. Using lasers with high beam quality allows for smaller holes to be drilled that achieve the tight constraints applied by the aerospace industry. A laser with a wide operating range of processing parameters provides increased manufacturing flexibility, especially for the larger parts. High quality pulsed lasers are also able to penetrate the ceramic based thermal barrier coatings (TBC) applied to some components to further raise their operating temperature, removing the need for a separate TBC removal step, during manufacture.



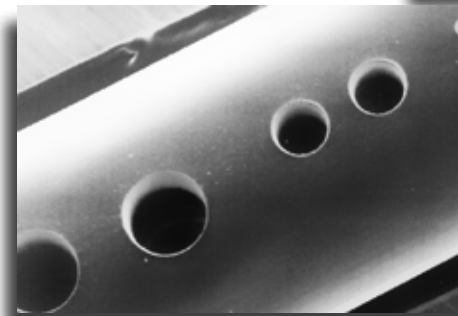
Semiconductor

Lasers provide the precision and versatility needed to penetrate a vast range of materials, including silicon wafers and delicate disk drive arms. The accurately controlled heat input supplied by the laser can produce small diameter holes, with no cracking or distortion of the component. Combined with rapid setup times and less tooling, lasers provide an economical solution.



Medical Device

When speed and precision are a priority, laser drilling is an ideal solution. The JK™ Lasers range can be used to drill clean holes in medical components that are only several mm in diameter. Once the most suitable parameters have been set, lasers can drill highly reliable holes, enabling bulk processing at a fast rate.



Laser Drilling

Welding | Cutting | Drilling



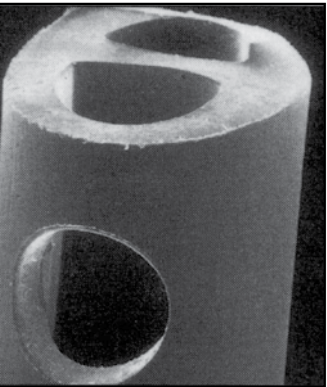
Aerospace

Aerospace components are commonly manufactured using metal alloys that are coated with a thermal barrier. Due to their high peak powers, good beam quality and ability to focus to precise spot sizes, lasers from the JK™ range are capable of penetrating these materials to drill clean holes of various sizes.



Automotive

Laser drilling is a process that lends itself well to the automotive industry. As lasers can be integrated into manufacturing systems and have their parameters easily programmed, manufacturers can expect consistent results at a much quicker production rate. As laser drilling is a non-contact process no damage is caused to either the workpiece or the component, resulting in reduced costs.



Support and Service

Welding | Cutting | Drilling

The relationship between JK™ Lasers and its customers is based upon more than just the specifications of its products. It can develop the best process for your applications and help you to get the most out of your laser.

The JK™ Laser difference identifies that finding a lasting laser solution is about far more than answering those initial questions. Engineering, Applications and Support teams are dedicated to providing an unbeatable level of customer service, even before the laser has been purchased and throughout the life of the equipment.



Global Support

Technical Support Agents for JK™ Lasers are strategically distributed across the globe and backed up by experienced service teams based at local support centres. This ensures that wherever your laser is located, there will be someone that is working in your time zone on hand to answer your queries.



Maintenance Contracts

To ensure that you get the very most out of your laser and to provide the peace of mind that your investment is in the best condition, JK™ Lasers provide arranged maintenance contracts.

Should a problem occur, customers who possess a maintenance contract can expect to be given priority concerning the speed of attendance and resolution of the issue. Contracts can be tailored to specific needs, a Technical Support Agent would be pleased to discuss this further.



Product Training

Unplanned downtime can be reduced if the training of your Maintenance and Process Engineering staff is delivered by the Technical Support team at JK™ Lasers. Core training will provide employees with an invaluable understanding of the products, from the perspective of those that have been involved in their manufacture.

Applications Laboratory Support

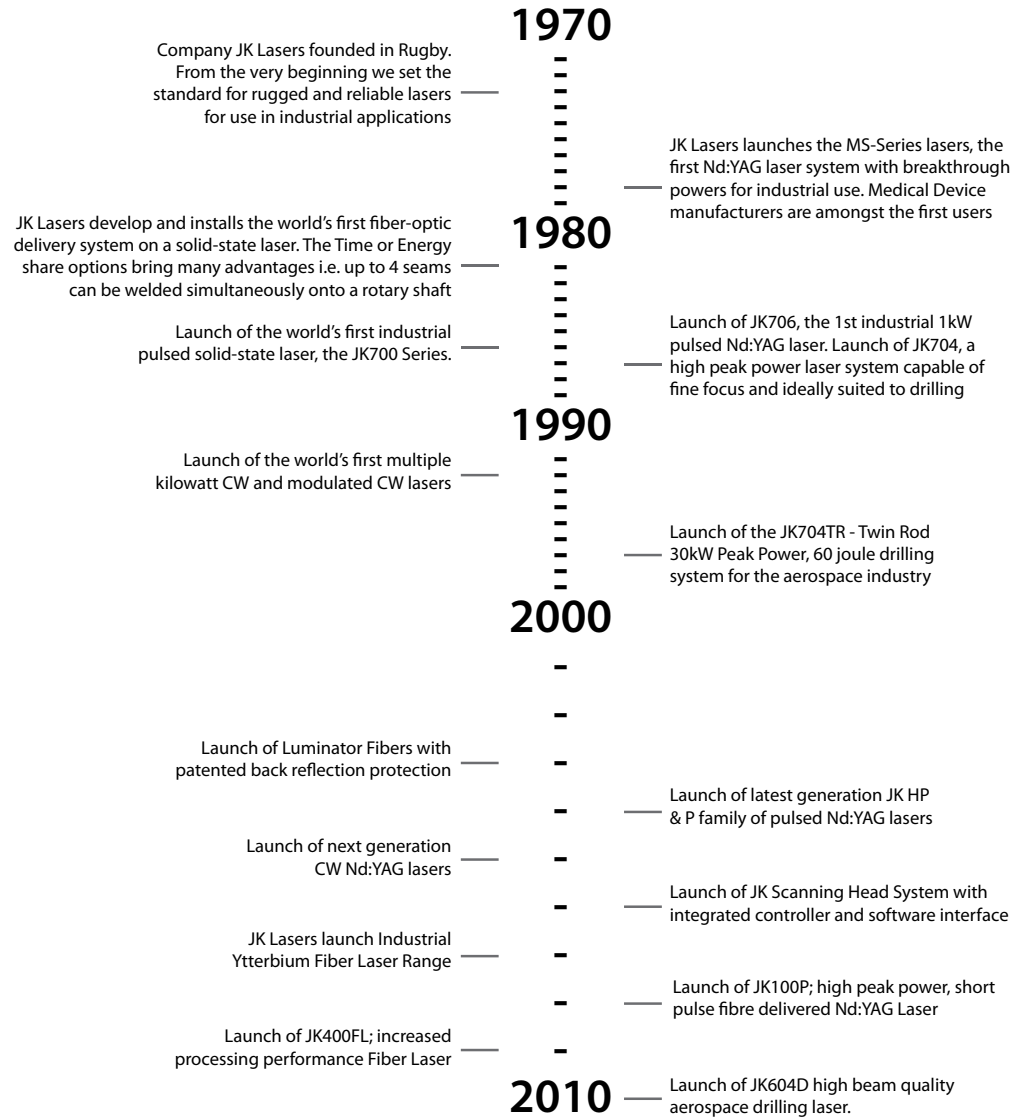
The state-of-the-art applications laboratories in Rugby and Suzhou are equipped with the very latest in work handling equipment, allowing the Applications team to demonstrate processing performance to a production level standard.

Facilities include a database of completed applications work for reference and a comprehensive on-site metallurgical test laboratory, where material processing performance can be scientifically analysed and demonstrated.

Before you even choose to purchase a laser, the Applications team will have identified the optimum parameters and set-up for your manufacturing process. If you opt to purchase a laser, you can rest assured that integration into your own system will be extremely straightforward.



JK Lasers History



Product Center:

JK Lasers - GSI Group
United Kingdom
Tel: + 44 (0)1788 570 321
Fax: + 44 (0)1788 541 904

Germany:

JK Lasers - GSI Group
Tel: +49 (0)4172 980 9193
Fax: +49 (0)4172 96 23 80

China:

GSI Precision Technologies (Suzhou)
Tel: +86 512 6283 7080
Fax: +86 512 6283 7087

Americas:

GSI Group
Tel: +1 781 266 5700
Fax: +1 781-266-5112

Italy:

Excel Technology
Tel: +39 039 793710
Fax: +39 039 2781032

Japan:

GSI Group
Tel: +81 3 5825 8855
Fax: +81 3 5825 8858

www.jklasers.com

sales@jklasers.com