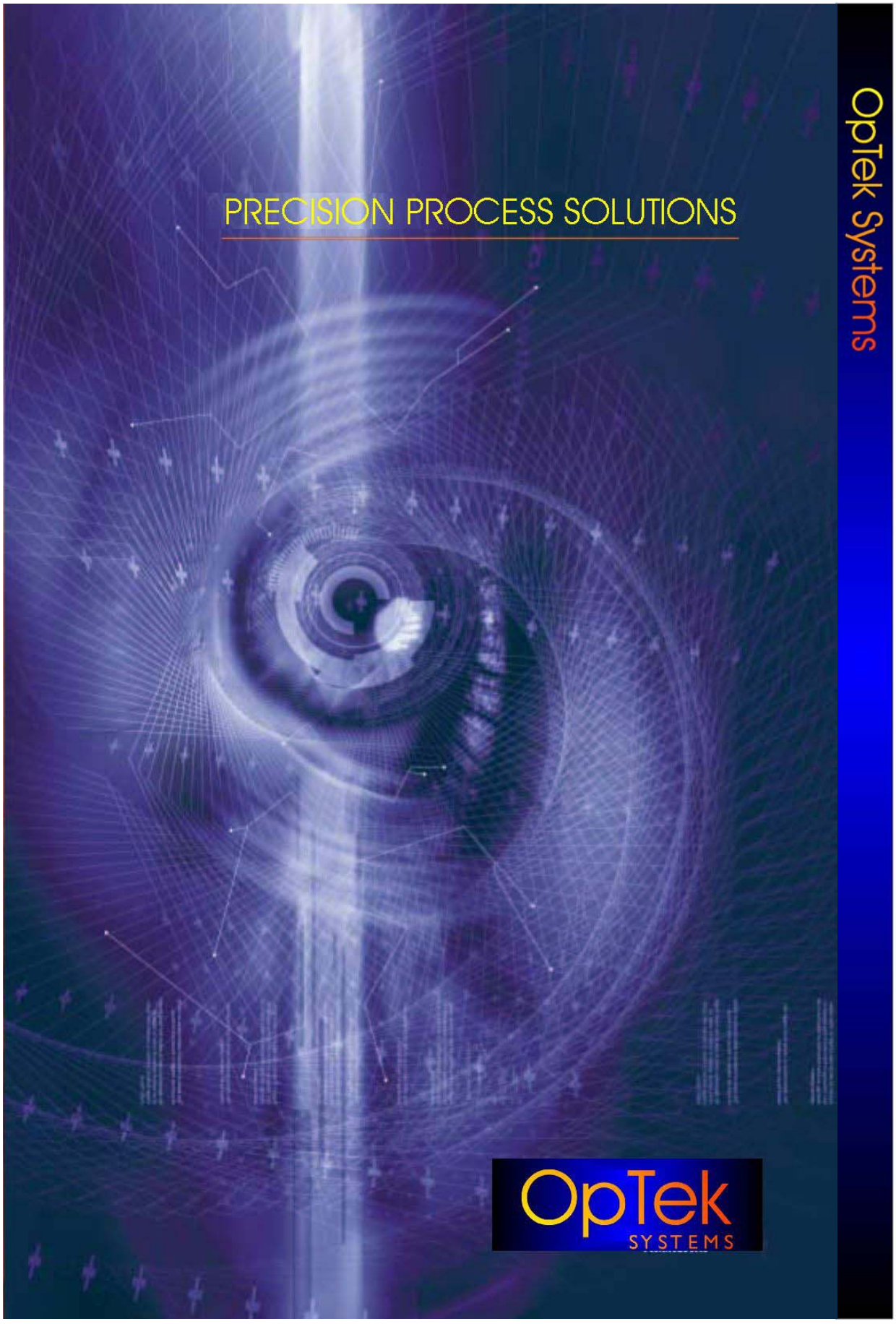
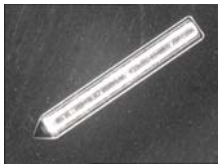

PRECISION PROCESS SOLUTIONS
OpTek Systems
OpTek
SYSTEMS



OpTek Systems in brief

OpTek Systems are world-leaders in production-line laser-systems for precision measurement and machining.

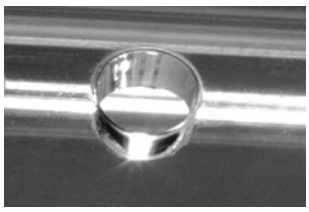
With an innovative and highly qualified staff, OpTek's business is truly global - over 80% of sales are outside the UK.

OpTek prides itself on the ability to take concepts from the proof-of-principle stage, through process development, and then transition them into reliable, production-line processes.

OpTek works with its customers to provide them with the appropriate *process* solution, and backs this up with reliable and responsive after-sales support.

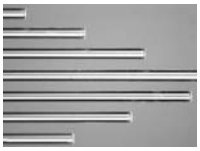
Many millions of precision-machined parts are made on OpTek machines each year and are deployed in daily use across the globe.

OpTek Systems is based in Abingdon, UK, and combines established competencies in laser and optical technology, vision systems, automation and control, parts handling and software development.



OpTek Systems HQ, Abingdon, UK

OpTek Systems



A STRATEGIC FOCUS ON INTEGRATION

By Mike Osborne, Technical Director, OpTek Systems

Companies of the 21st Century increasingly require integrated solutions to their production challenges. It is no longer adequate to have systems or sub-systems which work well in isolation, rather the combined whole must be made to work effectively and reliably.

Competitive pressures and incessant customer demand for ever-better quality means that incomplete or "dis-integrated" solutions will, either slowly or more likely quickly, become unsustainable for the business.

The dual requirements for better product quality and better manufacturing efficiency combine with a continual push for increased product functionality to provide the real challenge for industry.

Increased functionality means extracting more or better performance from the same product real-estate. This leads to demand for more, smaller, closer-packed features, and for better materials performance from the existing sub-components.

These areas of speed, efficiency and smaller feature size with precise registration are exactly those where vision and laser technology can, and is, playing an increasing role.

OpTek Systems core business addresses these challenges, combining proven expertise in a range of disciplines to provide integrated production-line solutions, realizing the benefits of the non-contact processing and measurement which lasers and vision systems permit.

With several world-firsts to our name, and with installations across the globe, OpTek are providing solutions into a wide range of industries from aerospace to pharmaceuticals, from electronics to packaging materials, from medical to optical.

I hope that this brochure gives you some idea of what we can do for you, and look forward to being able to demonstrate to you the benefits our technology can bring to your business.

OpTek Systems

OpTek Systems

A comprehensive range of automated & integrated solutions

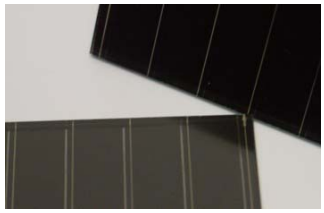
OpTek Systems provides state-of-the-art automated solutions to secure your process in a flexible, profitable and reliable way. To help you reduce costs without compromising on precision or quality, manage on-the-fly a great product diversity, adapt to rapid change and anticipate future needs, OpTek Systems solutions offer:

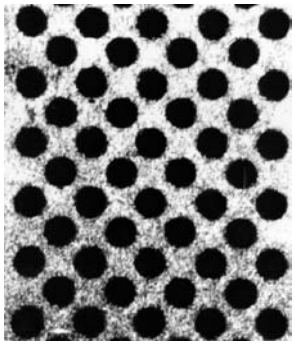
- Fully automated and integrated processes
- High precision reliability and repeatable quality level
- High productivity and line flexibility to cope with a large scope of products
- Modularity and scalability by design, making future upgrades easy

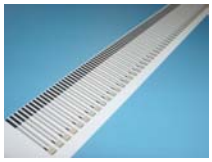
INDUSTRY SECTORS

OpTek Systems has supplied machines into a range of industries including:

- Aerospace
- Electronics
- Photovoltaics
- Packaging materials
- Pharmaceuticals
- Agriculture
- Medical
- Optoelectronics
- Automotive







OpTek Systems

A committed & experienced partner secures your process

OpTek works with its customers to provide the complete process solution.

Typically, suitably qualified staff engage with the customer at an early stage in the project design, contributing to the overall success and ensuring smooth integration of OpTek's part of the system.

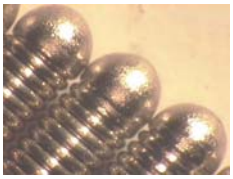
An important part of OpTek's approach is the end-goal definition. All too frequently we see examples where the failure to define and/or agree the bottom-line performance of the system as a whole results in a dispute between the supplier and customer at the point of delivery.

OpTek strenuously seeks to avoid such situations, with meticulous care taken in defining the division of responsibilities, interfaces and machine specifications. OpTek's demonstration facilities are frequently used to prove process performance and through-put prior to defining these criteria.

OpTek's talented engineers can often contribute significantly in areas which, strictly speaking, are outside their remit, bringing ideas from perspectives different to that of the customer. This has been demonstrated many times across a wide range of industries.

OpTek continues to support you and your process through machine installation and commissioning, and for the years to come.

All OpTek machines incorporate remote interrogation, diagnosis and control (where desired), allowing us to provide rapid and effective support. The modular approach to sub-systems allows us to provide rapid and effective support for all our systems.



SPEED & PRECISION

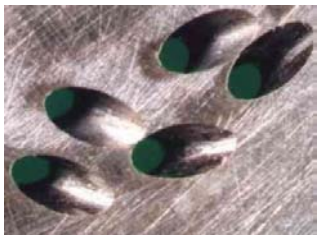
Whether in materials processing, or in measurement, OpTek's machines specialise in feature sizes in the range 0.1 to 500μm.

Features of this scale are machined or measured (or both) at production-line speeds. On substrates varying in size from sub-millimetre to many metres. Whether drilling fuel system components for race engines, or laser mapping of fighter aircraft canopies or even the laser treatment of human skin discolouration OpTek engineers have the experience.

MICROMACHINING

OpTek machines provide precision micromachining capabilities, with guaranteed resolutions to <1μm.

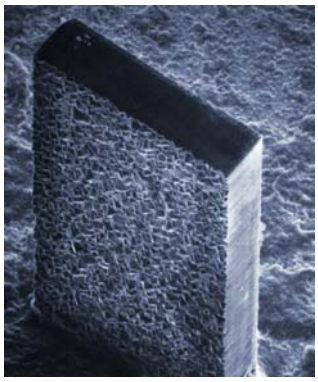
Operating at production-line speeds of up to 1200 parts per minute, OpTek machines provide an unprecedented combination of speed and precision. The team at OpTek Systems has a great many years of experience in the development of precision laser machining processes and the provision of rugged production equipment to support these.



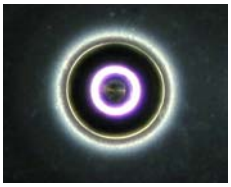
MEASUREMENT AND TEST

OpTek offers a range of remote, non-contact measurement and test capabilities. These are either supplied as part of an integrated machine, or can be added to other equipment.

With sub-micron resolutions and advanced processing software, OpTek's tailored systems provide the user with direct on-line QC on key parameters.



OpTek Systems



EXAMPLE INSTALLATIONS

OpTek Systems provides production laser micromaching equipment for a wide range of applications.

The machines supplied in the following examples all share a common factor, they are all being used in high duty-cycle production at up to 24/7.

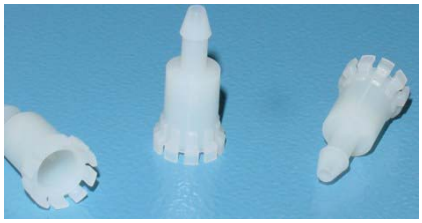
Many millions of components that have been processed on OpTek machines are in circulation around the world today.

This sample illustrates the diversity of our experience in delivering machines for the production environment:

Aerosol valve drilling

In injection moulding it is common practise to create small orifices in plastic components using small pins in the mould. This method has limitations in terms of hole size and angle; and the pins are subject to wear and breakage. The method also means that the manufacturer has to commit to a given hole size at the point of moulding the part.

For volume production of aerosol valves a common valve type is produced in bulk, which is then laser drilled with a range of hole sizes for different applications.



By removing the requirement to create the hole in the moulding process, it is possible to produce blank components for stock and then laser drill the required orifice in response to customer demand.

This type of *just-in-time* manufacturing is reducing inventories by many millions of parts. It also allows the manufacturer to respond rapidly to customer demand and different or new hole sizes can be produced in the 5-minutes taken to programme the new size into the machine with no tooling delays.

Processing 1200 parts per minute, the laser drilling machines must be robust and reliable, needing to handle large volumes of process debris.

OpTek Systems

Thin Film Capacitor Production

In common with other industries, there is a drive to reduce the size of passive electronic components. This is challenging for existing production techniques. By using novel laser micromachining, OpTek has allowed manufacturers to minimise capacitor design, as well as improving yields and performance.

The laser micromachining route also allows the simultaneous integration of other component elements, producing controlled inductive and resistive elements within the same overall miniature package.

Capable of operating with substrates little more than 1μm thick, the machines operate 24/7 with no attention save for re-loading of feed material and planned maintenance.

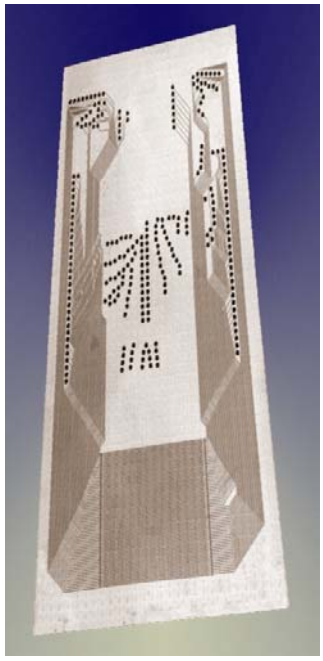
With a single machine producing several million capacitors per year, there are a growing number of these high-performance components in circulation in demanding consumer and military applications.

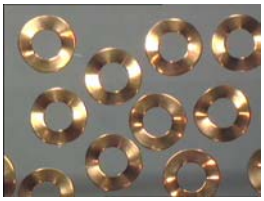
Mobile Communications

As compact communication and positioning devices become ever more sophisticated, so the need to develop the components within them increases. Hand held communication devices are produced in large volumes for the consumer market and yet contain some of the most advanced micron-electronics available.

Increasing demand for multi-wavelength operation from a single device, and the ability to operate in close proximity to other components, and at ever more tightly specified frequencies, is challenging the production of antennae.

In some device the need to create complex circuitry in conducting metal layers is addressed using fully automated photolithographic machines from OpTek Systems. Multiple machine installations operate 24/7 with minimal scheduled downtime, to handle increasing consumer demand for these products.





OpTek Systems

Laser Lensed Optical Fiber

OpTek Systems has developed a range of standard machines for laser machining lenses directly on optical fiber. A number of such machines are installed worldwide and are being used to machine lensed fiber for a variety of applications.

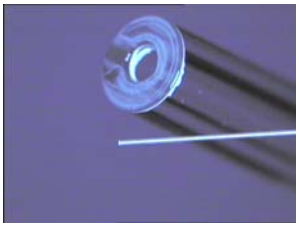
Lenses made on OpTek machines are used in almost 50% of pump laser modules produced in the world each year. Pump lasers are a fundamental component of modern broadband optical communications systems.

Due to the exceptional optical quality surface finish achieved by the OpTek laser lensing process, a significant improvement in the optical damage threshold on the fiber end is achieved. This is particularly relevant to the emerging high-power fibre lasers. Because of this, and for straight economic reasons, OpTek machines are used by the leading fiber laser manufacturers and account for more than with 80% of global production.

Quartz Tube Cutting

CW lamps and flash lamps are used in many laser and non-laser applications like welding, cutting, marking, hair removal and rapid thermal processing of silicon wafers.

The bodies of these lamps are laser cut from quartz tubing. OpTek has installed machines for automated handling and cutting of quartz lamp tubes,which offer significant commercial and technical advantage over conventional processing.

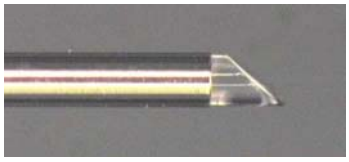


The world market leaders use this technology, and it is anticiapted that the economic savings, the reduction in porcess time, and the improvemnts in performance will lead to munufacturers transitioning 100% of their production to the laser route.

OpTek Systems

Laser Cleaved Optical Fiber

Related to the lensing systems, OpTek's family of laser cleaving machines create high quality optical facets on optical fiber. With a customer base covering Europe, the US and the Far East, these machines are utilised in routine production of a range of optical fiber products.



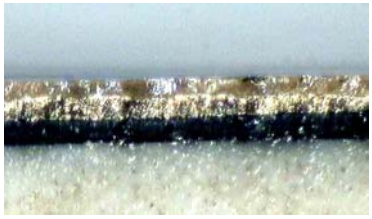
As an example, every fiber/cable to the home installation requires the use of a triplexer to decode the various signals between the home and the cable network. The worlds leading manufacturer of triplexers uses fiber cleaved on an OpTek machine.

With almost a million parts produced per year per machine, a sizeable fraction of the world demand for these components is produced in this way on machines in China and in Europe.

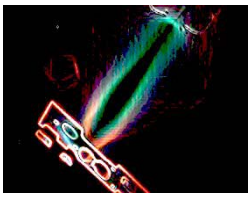
Bio Sensor Production

Modern disposable biological diagnostic tools offer almost instantaneous measurement of critical levels of, for example, blood gasses or glucose to be carried out by the patient.

The development of these detectors often requires machining of small features, such as wells, channels or facets, which typically need to be produced to exacting tolerances and with the minimum of collateral effects (i.e. minimum thermal input).



OpTek has developed processes for a number of bio-medical devices that are in routine production today.



For further information about how OpTek can help you contact:

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