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## Modular thread whirling with turbo options

Tooling manufacturer Horn has introduced tools for thread whirling, having six or nine inserts, providing an efficient, cost-effective way to produce single- and multi-start external threads and profiles. Very short cycle times are achievable when they are used on sliding-head Swiss-type lathes and the process offers other significant advantages over single-point thread cutting. With its base carriers and ring cassettes, the new type M271 modular tool system offers a multitude of combinations tailored to the various Swiss-type lathes and drive units on the market.



The S271 high-precision system allows customers to choose between conventional whirling with six or nine indexable inserts per ring cassette or the new Horn turbo whirling method, which uses nine precision-ground, double-edged indexable inserts. Three are for roughing, the remainder being finishing inserts, and all are tailored to the thread profile and material to be machined. Each cutting edge is subject to equal load, an additional factor in extending tool life.

Inserts are held accurately in place by a Torx screw, achieving maximum rigidity and precise indexing. Thus handling is optimised during insert replacement in the new modular whirling heads or conventionally in Mono block tools.

A tool configurator, which is available on the Horn website at [www.phorn.de/en/products/milling/thread-whirling-tool-systems](http://www.phorn.de/en/products/milling/thread-whirling-tool-systems), facilitates choosing the right combination of machine, drive unit and tool. The correct cutting data is also provided thanks to the new HCT cutting data calculator, which can be accessed via the same page.

Horn has introduced a modular thread whirling system and turbo whirling options with three roughing inserts and six finishing inserts per tool cassette. During turbo whirling, the former inserts machine the workpiece to the defined external diameter while the finishing cutting edges ensure that the thread flanks are geometrically flawless.

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# What the doctor ordered

Roger Barber reports from the impressive Renishaw facility in Miskin, South Wales

Global precision engineering company, Renishaw plc is one of the most successful British companies, having grown from a small innovative R&D and engineering company in 1973 to a global player with over 4,000 employees today.

Renishaw was established by David McMurtry (now Sir David McMurtry), chairman and CEO and John Deer, deputy chairman. The company's first product, the touch-trigger probe, had been invented by Sir David to solve a specific inspection requirement for the Olympus engines used on the supersonic Concorde aircraft. This innovative product led to a revolution in three-dimensional co-ordinate measurement, enabling the accurate measurement of machined components and finished assemblies.

Throughout Renishaw's history, it has made a significant commitment to research and development with typically around 14 to 18 percent of annual sales invested in this key area. This has enabled the company to diversify into sensors for CNC machine tools which are used for automating machine setting operations and in-process part measurement, position encoders for accurate motion control, laser interferometry for machine performance evaluation, systems to produce dental crowns and bridges, Raman microscopes for spectral analysis of materials, gauging technology, additive manufacturing and rapid prototyping, laser measurement and surveying systems and medical devices for neurosurgical applications.

Last autumn, the Gloucester-based company opened a new Healthcare Centre of Excellence at its Miskin site, located close to Cardiff, South Wales. The Centre, which was formally opened on 29th September by The Rt Hon Carwyn Jones AM, First Minister of Wales, provides a facility for the manufacture of custom medical devices, as well as education and training for the life sciences community. The Renishaw Healthcare Centre of Excellence is a unique facility that highlights the company's continuing technology advances for the healthcare sector, including patient-specific implants, dentistry and neurosurgery. It contains a mock non-sterile operating theatre and facilities for education, training, workshops and lectures, plus a facility for



the manufacture of Class 3 custom medical devices produced on Renishaw metal additive manufacturing (3D printing) machines.

Renishaw believes that it is extremely important that neurosurgeons have a familiar and comfortable environment in which to practise using its latest technology. The mock operating theatre suite within the Healthcare Centre of Excellence mimics a real-life hospital setting, but without the complication of a sterile environment. In the state-of-the-art suite, which is lead-lined to enable X-ray use, surgeons can be trained to perform highly complex stereotactic neurosurgery procedures using the Renishaw range of neurological products. The suite also includes video and audio technology that allows the live streaming of training to the adjacent lecture theatre or to the neurosurgeon's support team that may be located in another country.

Stereotactic neurosurgery is a technique used by neurosurgeons to locate surgical targets within the brain in a minimally invasive way. Surgeons would most commonly use this technique in procedures including deep brain stimulation (DBS), stereoelectroencephalography (SEEG) and biopsies.

The manufacturing facility within the Healthcare Centre of Excellence produces custom medical devices under an ISO13485 quality management system. Here Renishaw's extensive manufacturing knowledge combines with its latest metal

additive manufacturing machines to enable the precision production of dental frameworks, craniomaxillofacial patient specific implants, jigs and guides.

Renishaw is a world leader in the design and manufacture of metal 3D printing systems which are made at the Miskin site in a production hall adjacent to the Healthcare Centre of Excellence, the only such products made in the UK. The site, purchased from Robert Bosch Limited in September 2011, has now been fully refurbished by Renishaw and the 460,000 sq ft facility also includes the manufacture of metal components, electronic sub-assemblies and healthcare R&D activities.

The close proximity of Renishaw's manufacturing operations to the Healthcare Centre of Excellence is seen as being highly beneficial for collaboration between engineers and healthcare professionals, as they work together on current and future healthcare challenges. A demonstration area within the Centre also showcases Renishaw's full range of metrology and healthcare technologies, including Raman spectroscopy instruments, neurological products and therapies, dental scanners and frameworks, molecular diagnostics and additively manufactured implantable devices.

**Renishaw presents implant technology for oral and maxillofacial surgeons**  
Renishaw attended the British Association of Oral and Maxillofacial Surgeons (BAOMS)



You need to be regulated for approval for in-house design. Alternatively, you need the hospital to take on the design element and send you the file.

"We created the Adept program and we are we are developing it further in order to offer it to hospitals. It can currently only design cranium plates and orbital floors. A lot of cranium plates need to be designed with splits in them for more flexibility. More digital design is needed in order to send the file to manufacture.

Annual Scientific Meeting at the International Convention Centre in Birmingham from June 28th - 30th. This platform for surgeons and industry professionals provided the opportunity to present the latest research and development in the field. Renishaw presented its latest developments in craniomaxillofacial implants supported a workshop run by three surgeons with whom it has collaborated.

This year marked Renishaw's third appearance at the conference, where it exhibited additively manufactured implants and guides. The implants are designed using information acquired from a patient's MRI or CT scan, produced on a Renishaw additive manufacturing system and offered in three finishes; clean, satin and mirror. The implants and guides can be used in many oral and maxillofacial applications.

Renishaw's stand featured demonstrations of its new implant design software, ADEPT, to show first-hand how easy-to-use the software is and how it can improve a hospital's working practices.

"3D printed implants and guides are still considered a relatively new technology for craniomaxillofacial applications," explains Ed Littlewood, marketing manager at Renishaw's Medical and Dental Products Division. "However, a growing number of UK NHS hospitals are now using additive manufacturing to improve predictability, efficiency and safety. An increasing number of surgeons are commissioning the design and production of additively manufactured bespoke implants and guides."

### The importance of digital design

During the visit to Miskin, Bryan Austin, director & general manager of the Dental Products Division for Renishaw, explained the importance of digital design in the area of medical and dental applications:

"One of the big challenges in subcontract manufacture is that you need the data in order to make the part. There are few hospitals that have digital design capability.



"We supply subcontracting of dental implants and also supply solutions to companies that want to take this on. We also look after sales of additive manufacturing equipment to end users.

"We have an advantage over our competitors in that we manufacture under a 13485 quality management system up to Class 3 for implantable devices. This means that we can not only demonstrate to potential customers what the AM equipment can do but also the regulatory quality environment that it has to be done in. If you buy a machine from us, we can also give you all the information you need. We are the only metal additive company that does that. 3D printing is not as simple as people make out. It's not just a question of pressing a button and a part comes out."

For more information, visit [www.renishaw.com/en/metal-3d-printing-for-healthcare-24226](http://www.renishaw.com/en/metal-3d-printing-for-healthcare-24226)

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## Mirror finish for medical implants

Nothing lasts for ever, at least not in endoprosthetics. Even the very best quality of implant has only a limited life. One of the main factors in this is the quality of the surface finish. OTEC Präzisionsfinish GmbH has extended the range of applications for automated grinding and polishing processes to medical engineering. This means that a new dimension in surface finishing can be achieved during the manufacture of medical implants.

Different types of implant place vastly differing requirements on the surface finish. Depending on the field of application, there are a number of criteria which determine the quality of the product: a highly accurate fit, a homogeneous surface, pronounced or minimal edge rounding. Combined with the complexity of the shapes normally involved, these factors have made reliable automated processing virtually impossible, until now.

### A perfect surface extends the life of replacement joints

As a result of several years' work, OTEC Präzisionsfinish GmbH has developed special parameters for the drag finishing and disc finishing processes to meet the particular requirements of implant



A perfect surface extends the life of replacement joint

manufacturing. This makes it possible to achieve fast and economical surface finishing combined with consistent quality. Workpieces of any shape and weight can be deburred, ground, smoothed and polished in a very short time. This is performed by moving the workpieces through a customised composition of abrasive media, whereby the workpieces themselves are either loose or fixed in a rotating holder.

In the case of hip or knee joints, a homogeneous, very smooth and highly polished surface is demanded of the contact areas. For this purpose OTEC has developed a special dry process for drag finishing. In this process the workpieces are clamped in suitable holders and dragged through the appropriate grinding and polishing media in a number of stages. Clamping the workpieces prevents them from damaging each other. The processing results depend on determining the ideal clamping angle. This enables Ra values of 0.03  $\mu\text{m}$  to be achieved.

### A mirror finish but with precise edges

Bone screws and dental implants are made of special stainless steel or titanium alloys. In order to obtain a good fit, unrounded but burr-free edges are required as far as possible. A smooth, polished surface is conducive to easy insertion and removal. Furthermore, the smooth surface simplifies the process of disinfection immediately before use. OTEC has developed a way to fulfil all three requirements in a single process. By using a disc finishing machine it is possible to create a smooth, highly polished surface without any significant edge rounding. After this single-stage process the workpieces are light in colour, have a pristine finish and exhibit a much higher quality. In this process Ra values of 0.03  $\mu\text{m}$  can be attained.



A mirror finish with precise edges is no problem with a process developed by OTEC

In contrast to this, bone plates usually require a considerable degree of edge rounding and the surface should be as smooth and homogeneous as possible. Here, too, a disc finishing machine is used, albeit with different process parameters. This enables all traces of stamping and chip removal operations to be removed in a very short time and produces a smooth, high-quality surface.

So-called otoplastics parts for hearing aids or hearing protectors are made from special plastics in a rapid manufacturing process. This manufacturing process creates a rough surface which does not provide the accurate fit and comfort required for insertion into the human ear. OTEC has developed a process with which the ear moulds can be ground in a disc finishing machine in a relatively short time. The special design of the machine gives a very high-quality

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smooth surface finish in a process that is gentle on the material. This means that sensitive workpieces can be processed very quickly and reliably without fear of damage, eliminating the need for complex and time-consuming manual polishing and the quality variations associated with manual processes.

## From consultation to series production

In order to best fulfil the requirements of each individual application, it is essential to determine the ideal combination of all relevant process parameters. This includes amongst other things the choice of process, the composition of the processing media, the speed of rotation, the processing time and, in the case of drag finishing, the clamping angle.

For both processes OTEC supplies machines in a variety of sizes, from bench top units to fully-automatic plants. As for the choice of the right medium, potential customers are invited to have a sample of their product processed free of charge at OTEC's finishing centre. This service is available to customers all over the world.

Systems for separating the finished workpieces from the processing medium



The right mixture for precision: disc finishing machine from OTEC

and for reprocessing the water used complete the OTEC range of products.

OTEC is a medium-sized manufacturer of drag finishing, disc finishing and stream finishing machines. Founded by Helmut Gegenheimer in 1996, the company has steadily established itself on the market by developing innovative new machine

concepts and numerous patented processes.

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## Economical 5-axis cell for producing medical components

Sheffield-based Tecomet, formerly Symmetry Medical, has installed three Hermle trunnion-type 5-axis machining centres for manufacturing stainless steel medical components. The machines were supplied between March and July 2016 by sole UK agent, Geo Kingsbury. Full production started in early October 2016 and quickly ramped up to around-the-clock, high volume manufacture.

In view of the vast product range, two of the Hermle C 400 machining centres have 87-tool magazines, allowing all component variants to be produced without changing cutters, so minimising downtime. The other machine has a standard, 38-tool magazine and is reserved for larger batch quantities.

Components are produced from two grades of 316 stainless steel forgings produced on the Sheffield site. Generally they undergo two operations, although some require only one. Programs are long, as the components have complex shapes to match the human anatomy, and some cycles run to 300,000 lines of code.

Machining operations are mainly 3-axis

with the other two positioned and clamped, while some components require 4+1-axis cycles. They involve taper milling, slotting, drilling and tapping and take between 25 and 90 minutes.

Tecomet production engineer Steve Jackson says: "Hermle C 400 machines were chosen for this latest production cell because we know how good they are.

"We installed a pair of smaller C 22 U 5-axis machines a couple of years ago to produce medical instruments and the installation has proved very successful.

"We have also been impressed with the service from the UK agent, Geo Kingsbury. The support is second to none. If we have a problem on a machine or need help with an application, they are on it like a flash."

The Hermle C 400 is one of a new line of machines that are of equivalent high quality to other 5-axis models built by the German manufacturer, but are offered with fewer options. This lowers the price, so the 850 x 700 x 500 mm capacity machine costs approximately the same as the 450 x 600 x 330 mm capacity, fully-featured C 22 U but



offers well over three times the working volume.

Through-spindle coolant delivery, essential for machining stainless steel, is provided as well as tool measuring and breakage monitoring. Minimal idle times result from 6 m/s<sup>2</sup> acceleration to 35 m/min rapids in all linear axes. Trunnion swivel is 25 rpm through +91 / -139 degrees, while C-axis positioning is at 35 rpm. Control is provided by a Heidenhain iTNC 530.

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## Helium free MRI machines hold key to greater access

By Austen Adams, MD of Avingtrans PLC's energy and medical division

Advances in imaging technologies has been one of the biggest boons to medical science of the last century. From the first clinical X-ray in 1895 to the development of CT scanning in 1972 and MRI technology in 1981, the ability to carry out non-invasive imaging inside the human body has become a key aid to diagnosis, and even treatment, across a range of conditions.

Where MRI (Magnetic Resonance Imaging) really scores is in the fact that not only does it provide very clear images of soft tissues within the body, but that it also doesn't require patients to be exposed to potentially-dangerous, over the long term, radiation to obtain those images.

MRI imaging works as the human body is mostly made up of water. Those water molecules, H<sub>2</sub>O, contain hydrogen nuclei (protons) that can be pulled into alignment when passed through a magnetic field. MRI machines use powerful magnets to align the nuclei before a variable magnetic field is generated, causing the atoms to resonate known as Nuclear Magnetic Resonance (NMR). The nuclei then produce their own rotating magnetic fields, which the scanner detects to create the image. In short, protons in different body tissues return to normal spin patterns at different rates, allowing the scanner to differentiate between tissue types. The scanner settings can also be adjusted to produce contrasts between different tissue types and show different structures in three dimensions.

Cambridgeshire-based Stainless



Stainless Metalcraft has provided the machine hardware for nearly half the world's MRI machines

Metalcraft made prototype fabrications for the very first MRI scanners in 1981 and to date, the company has provided the machine hardware for nearly half the world's population of MRI machines. This includes both pre-clinical scanners (for use in scientific research such as drug discovery) and clinical scanners (for use on humans).

Demand for MRI machines around the world is increasing as clinicians seek to increase access to diagnostic imaging to

more communities, while the number and types of conditions MRI images can be used to diagnose is also expanding quickly. For example, as well as musculoskeletal problems, eye and inner-ear conditions, strokes and aneurysms, there is a growing body of evidence to suggest that MRI scans can be used to detect autism in siblings and is more effective than existing chemical tests at identifying prostate cancer.

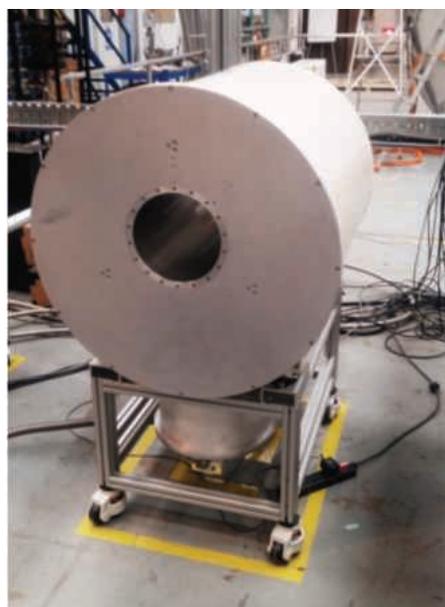
The challenge in both bringing MRI technology to more patients and improving diagnoses lies in making MRI technology more affordable.

The key to overcoming this lies with the development of non-cryogenic MRI scanners.

Current scanner designs use liquid Helium to cool the superconducting magnet coil to a temperature of 4.2 Kelvin (-269 °C). A typical scanner uses 1,700 litres of liquid helium, which needs to be stored safely and on older, non-recondensing systems, regularly topped up. If the magnet should 'quench', transitioning from the normal operating superconducting state to an electrically resistive state, the liquid Helium becomes gaseous and expands to around 740 times its initial volume, displacing air in the room. This can potentially create an asphyxiation risk and so all scanning centres currently require specialist ducting to be installed as a safety feature, to duct away the



7 tesla magnet with 170mm diameter room temperature bore



7 tesla magnet with 240mm diameter room temperature bore

gas. All of this limits the choice of location and adds to the cost of running the machines.

Helium is also an expensive, finite element, with the majority of the world's helium being created by radioactive decay and obtained from subterranean natural gas sources. It can't be artificially synthesised and is non-renewable, so the challenges are clear.

Having been involved with the MRI industry from the beginning, Stainless Metalcraft's parent company, Avingtrans PLC, recently acquired a company that may hold the answer. Scientific Magnetics, a spin off from Oxford Instruments, joined our energy & medical division in February this year and is a world leader in the development of cryogen-free superconducting magnets. It is already home to a low helium, whole body MRI magnet, as well as a range of horizontal cryogen-free pre-clinical magnet systems that offer high field stability and can be installed virtually anywhere there is an electric power supply.

While the technology has been proven in laboratory tests, Scientific Magnetics expertise combined with Stainless Metalcraft's production manufacturing

capability means we are now well set to bring this game-changing technology to a wider market.

And the potential is almost endless. From mobile MRI scanners that can be used in difficult to reach geographies or easily moved between wards to for use with vulnerable patients, such as neonate babies; to affordable, accessible MRI scanning centres in shopping centres or even on cruise ships, removing cryogenic gases, and helium in particular, from the MRI process looks set to free the technology, allowing physicians to diagnose and treat more patients quickly and cost-effectively.

Stainless Metalcraft forms part of Avingtrans PLC's energy and medical division, which offers a one-stop shop for the design, manufacture, installation and maintenance of systems for the oil and gas, nuclear, power, renewables, environmental and medical markets.

The division has facilities in Chatteris, Cambridgeshire; Aldridge, West Midlands;



Rotherham, Yorkshire; Oxford and Buckingham.

A lower-cost facility in Chengdu, China is also dedicated to volume customers' products. Supported by a 'Safe Low Cost' philosophy, customers benefit from global value sourcing while retaining the quality controls and strategic support of the division's UK operations.

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## Gated hot runners help GB Precision boost medical tool productivity

Birmingham-based precision engineering firm, GB Precision provides complex bespoke solutions including multi-impression mould tools, as well as components and sub-assemblies to customers in demanding industry sectors such as medical and pharmaceutical packaging, aerospace and F1.

One recent challenge tackled by the company was for a rapid-cycle, multi-impression medical packaging mould tool where the specified moulding material, a high performance, engineering polymer, had a known tendency to "string" during the moulding process.

From the outset, the customer had specified the use of a hot runner system for the tool, however, as director Paul Turner observes: "There are hot runner systems and hot runner systems and you tend to get what you pay for. The original specification had assumed quite a simple system, which, although it would have been perfectly adequate for a less challenging application, would, in this case have resulted in a reduced cycle time and a narrower

moulding window, due to the nature of the material being moulded."

During discussions with the customer, GB Precision was able to convince it that incorporating a gated hot runner system would allow the optimisation of the tool design with regard to filling and cavity orientation and so reduce the moulding cycle-time. The customer had been looking for a 10 second cycle, but in the event the tool was able to operate on a much-reduced cycle, with the moulding window also substantially increased and material wastage reduced.

Paul Turner explains; "By providing our engineering expertise at the tool design stage we were able to provide our customer with long term benefits in his tool's productivity. We were able to show that the initial additional cost of incorporating the more complex valve gated hot-runner system would be quickly outweighed by savings in accurate mould control, setting optimisation and waste



A hot runner tool at GB Precision

reduction, which is particularly important in medical applications, where scrap often cannot be re-used."

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# Deep hole drilling subcontract service expands

If a component has to be drilled with one or more holes of large length-to-diameter ratio, a manufacturer has two options: buy a deep hole drilling machine and the associated tooling or send the parts out to a specialist subcontract shop. Either way, TBT UK in Coleshill is frequently the go-to company for these services, especially if the work is complex, involves drilling multiple holes at compound angles and includes additional machining operations.

Managing director Mark Ramsay says: "Since it was founded in 1966, our German parent company, TBT Tiefbohrtechnik (TBT), has consistently been at the forefront of deep hole drilling technology, both for off-centre, block-type work and for concentric bar-type applications.

"Our company was one of the first to introduce computer-controlled machines. It develops control software on a continuous basis and has built machines with over 30 CNC axes.

"It was also a pioneer in adding in-cycle milling and threading operations, so a manufacturer does not have to re-clamp a part for subsequent operations. Handling time is saved and accuracy is improved in terms of hole position, diametrical tolerance and straightness."

All this functionality is available to both purchasers of machines and to people using the 1,700 square metre subcontract facility in Coleshill, where 10 machines provide a wide range of economical production solutions to suit different applications. They range from simple to complex and involve drilling holes from 0.9 to 200 mm in diameter and up to 4 m long (dependent on diameter-to-depth ratio) in components weighing up to a maximum of 24 tonnes.

Mark Ramsay explains: "Our subcontract division is undoubtedly one of the leading deep hole drilling facilities in Europe. We were led into this area soon after the TBT UK subsidiary was set up in 1984, at which time customers that had a requirement for deep hole drilling in their components but could not justify the purchase of their own machine came to us for a subcontract service.

"This coincided with the growth of, amongst others, the oil and gas industry and we found ourselves drilling deep holes in complex components in difficult materials including nickel based alloys to very



demanding delivery schedules. This led to further work in the industry, which continues to be important to us, as the requirement for ever more complicated drilling plays to our strengths."

One reason for increasing component complexity was the advent of powerful CAD systems able to design such parts and the widespread introduction of 5-axis machining centres capable of producing them. The trend was also obvious in mould and die manufacture, another important sector for TBT UK, as waterways in mould tools for example are becoming ever more convoluted and require CNC drilling at precise and often compound angles.

By the mid-90s, subcontract work had grown to become more than 50 percent of TBT's turnover in the UK and the proportion has been steadily increasing ever since. It prompted a move in 2003 from Kenilworth to the current, considerably larger premises with higher capacity craneage in order to cope with the ever-increasing size of workpieces. The company was able to cope with increasing demand and the relocation also allowed investment in a large, table-type TBT machine to expand the size of work that could be handled.

Today, projects going through the subcontract shop at any one time could range from a single mould tool to thousands of medical or engine parts. Often the

materials machined are exotic, from Duplex, Super Duplex and other high-end stainless steels to nickel-based alloys including Waspaloy, Hastelloy and Inconel.

The facility, which contains a comprehensive variety of machine types and sizes as well as different technologies to tackle the diverse work, is well equipped to double as a showroom. Additionally, it is a source of used deep hole drilling machines for customers that cannot always justify the cost of new equipment. An area is set aside for used machines, which are purchased on spec and rebuilt, and for refurbishing machines to order.

According to Mark Ramsay, automation of TBT machines is becoming increasingly common for high volume production and frequently repeating cycles, especially if a machine has more than one spindle. A gantry-mounted or pick-and-place robot loads and unloads components and a tool magazine can be fitted to allow automatic exchange of mills and other cutters for ancillary operations. More recently, auto change of the gun drills themselves has become process-stable after years of research and development by TBT into ways of handling these unwieldy tools reliably.

Retrofit of automation equipment to a user's machine, with full CE marking and warranty on parts and labour, is carried out in Germany at the main factory in Dettingen.

Control system retrofits are performed in Coleshill, as are all service activities for the UK market. Spares are available for machines built by the company since its inception in 1966.

Apart from machine sales, refurbishments and retrofits, TBT manufactures and supplies a wide range of types and sizes of deep hole drills with a variety of cutting edge and chip breaker geometries. In addition to new tool sales, the company retips and regrinds customers' tooling.

The drills are not only used on TBT's own machines. With their precision, superior performance and internal coolant supply to the cutting edge, certain variants for drilling shorter holes are well suited to use on conventional machining centres and lathes. They support the requirement for manufacturers to introduce one-hit production on a single machine platform wherever possible to reduce manufacturing costs and enhance component quality.

TBT is a member of the multinational Nagel Group, which also manufactures honing and superfinishing machines and tooling. Unsurprisingly, TBT UK has equipment in Coleshill for providing this ancillary subcontract honing service for bores in the size range 25 to 250 mm diameter by up to 4 m deep.

Looking to the future, Mark Ramsay concludes: "Aerospace is a small part of our business at present, but sustained growth in this sector in the UK should increase our deliveries into the supply chain."

"Automotive is also a significant market for TBT with the constant drive for environmentally clean and fuel efficient vehicles.

"Oil and gas is important for our subcontract shop and now shows signs of recovery after a long period in the doldrums. A driver for growth will be technically advanced deep hole drilling solutions to make production more economical for traditional petrochemical



companies looking to compete commercially with fracking of shale oil and gas.

"The renewables sector often needs our services, for example drilling of wind turbine shafts, and remains relatively buoyant.

"The big one will be nuclear when, almost inevitably, new power stations are built to meet the energy needs of a low-carbon world. Deep hole drilling of heat exchangers and other components are perfect applications for us."

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# New cross table deep hole drilling machine for tool and mould manufacturing

A single machine for economic deep hole drilling, milling and tapping

During this year's Moulding Expo in Stuttgart, the German-based company TIBO Tiefbohrtechnik GmbH presented the new type KTE cross table deep hole drilling machine. Tibo's previous supply range covered single and multi-spindle deep hole drilling machines for round components. The range of the machine maker from Swabia is now complemented by the type KTE machine series, which is suitable for deep hole drilling in cubical components.

Applications for the KTE series include the tool and mould making industries, where deep hole drilling is performed to create coolant passages in the tools. The KTE cross table deep hole drilling machine allows for cooling channels with a diameter between 2 mm and 40 mm to be drilled at a depth of 1,000 mm and beyond. Required closing threads can also be created quickly and reliably, using the milling and tapping kit. When it comes to control technology, Tibo, as always, chose components of high quality, equipping the KTE series with the latest CNC control equipment 840d sl by Siemens. The clamping table features a travel path of 800 mm for the x-axis and 350 mm for the y-axis as well as a load bearing capacity of at least 3,500 kg.

The modular system that is familiar from Tibo's single fluted and BTA deep hole drilling machines also allows for other

combinations of drilling range, drilling depth and table size. The large universal clamping table with precision lifting elements and direct position sensors leaves nothing to be desired when it comes to positioning accuracy and repeatability. An optionally available rotating tailstock also allows for reversed centric drilling of round components. This means that the cross table deep hole drilling machine series KTE can be used for both eccentric deep hole drilling for all kinds of components and for reversed centric deep hole drilling, making it the new all-rounder by the high-quality supplier from Germany.

### Deep hole drilling solutions for every requirement

Whether it's the oil and gas industry or renewable energies, hydraulics and pneumatics, automotive, aeronautical, shipbuilding or wherever highly precise and durable deep hole drilling machines are needed, Tibo can provide optimum custom solutions.

### Oil & gas

Whether its drill collars, drillpipes or submersible pumps, Tibo deep hole drilling



machines will allow high-precision drilling operations with minimal runout in alloys typical for the applications such as nickel steels. The machines come with additional features specially developed for the task, for example chip breakage monitoring for reliable cutting which is integrated as standard.

### Automotive and vehicle construction

Camshafts, crankshafts, transmission shafts, drive shafts, flanged shafts, injection nozzle bodies, fuel rails, valves, con-rods or piston pins, there is hardly any other industry in which so many deep hole drilling applications are encountered. This is in addition to large quantities and maximum output in the shortest possible time. Tibo deep hole drilling machines deliver solutions here that are as precise as they are efficient. Consequently, when through-holes are present, for example in camshafts and common rails, it is also possible to drill simultaneously from two sides. All over the world, Tibo customers rely on deep hole drilling machines that have been specially developed for this task with designs that incorporate up to 12 spindles, including fully automated part handling by, for example, synchronised chains, overhead gantries and robot loading. This allows cycle times that are almost 50 percent quicker.

### Shipbuilding

In the manufacture of ships' rotor shafts in particular, but also in the case of numerous components for pumps and powertrains, the field of shipbuilding involves challenging



deep hole drilling tasks that can be done with great precision, reliably and efficiently with Tibo deep hole drilling machines.

## Medical technology

Medical implants such as bone nails, medullary nails, bone screws or stents, most of which are made of titanium or stainless steel alloys, require maximum precision deep hole drilling with minimum runout. Parts with very thin walls are exactly those that present a real challenge, but that can also be brilliantly and reliably overcome with Tibo deep hole drilling machines.

Tibo Tiefbohrtechnik GmbH is a company with operations throughout the world that has specialised in the design and production of modular deep hole drilling machines. Founded in 1994, and with headquarters in the town of Pfullingen in Baden-Württemberg to the south of Stuttgart, it is one of the leading suppliers of single-spindle and multi-spindle gundrilling and BTA deep hole drilling machines for a broad range of applications.

Embedded into a medium-sized group with currently 13 companies, and more than 1,000 employees, its customers benefit from shortest reaction times in all aspects of their



deep hole drilling machine. As a south German machine constructor, TIBO manufactures exclusively in its own plant at the Pfullingen headquarters. Its suppliers also manufacture mainly locally, which means the company can proudly proclaim that its machines are made in Germany. Together with its collaboration partner Gehring Technologies, it is able to offer complete process solutions from deep hole drilling right through to honing.

Since all components are normally available from stock, speedy project realisation is ensured. The average time from the placement of an order to delivery is just four to six months.

Tibo deep hole drilling machines have

been in use on all five continents for decades. The company supplies custom and optimum solutions for customers specific deep hole drilling work.

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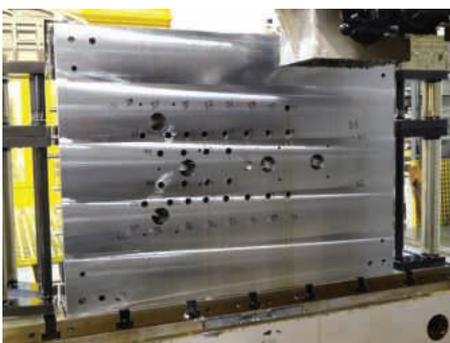
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# Mollart opens supply chain to North American automotive sector

In response to a major surge in automotive die and mould contracts, mostly from North America, Mollart Engineering has enhanced its full integration of specialist multi-axis deep hole drilling software able to increase application and programming capability for multiple side approach, compound angle and specific interconnecting hole and feature targeting.

The software integration increases the capability of Mollart's Chessington operation to work directly from 3D models, access the data and write programs more efficiently and with high degrees of accuracy, while also enhancing the ability to more easily incorporate elements of a workpiece such as porting features. These operations can involve drilling, counterboring, reaming, threadmilling and small feed hole drilling as well as the production of sealing faces in addition to milling and profiling. These are carried out on the installed Matrix DHD, Prismabore PRB40 and Centeplex multi-axis, dual-spindle special purpose drilling and milling centres plus a range of Mazak Integrex turn/mill centres.

Operations director Mike Pragnell says: "We have enhanced our processing capability to include one-off manufacture of moulds and dies in steel and aluminium incorporating multiple cooling and venting holes with complex intersections. Our new software provides highly accurate program data to ensure we maintain specific geometric relationships and we are currently building our library with the likes of tooling and its application data linked to material types."



Multiple cooling holes being drilled on a mould plate

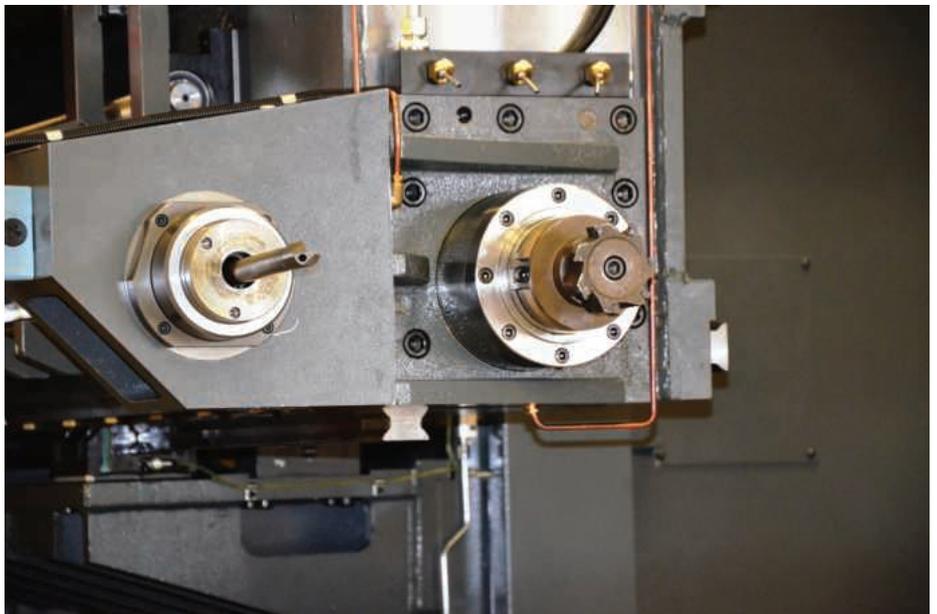


Gundrilling cooling holes in automotive die

Mollart's success in the automotive sector in North America has been achieved through its ability to offer a complete package of machining with strong internal

machine provides a single cycle production capability with a high rigidity solution to combine milling sequences on components weighing up to eight tonnes with deep hole drilling and boring capacity for holes between 6 mm and 40 mm diameter by 1,500 mm deep. Typical components machined apart for moulds and dies include multi-feature Inconel and titanium parts and the combined drilling of cooling holes needing extended depth with the same components requiring milled feature.

Meanwhile, the Mollart Matrix DHD, a 4-axis deep hole drilling centre with 3 mm to 30 mm diameter by 1,000 mm drilling specification is targeted to meet deep hole drilling requirements with high levels of versatility. The Matrix machine is ideal for a



Mollart Prismabore PRB40 a 5-axis, two-spindle gundrill and milling centre

application team support based on a successful deep hole drilling machine tool background plus its own specialised toolroom service. This has led to current orders for the rough and semi-finish machining plus multiple hole drilling covering up to 30 dies in a month in sizes up to 2.5 m by 2.5 m by 300 mm being shipped.

The Prismabore PRB40 deep hole drilling machine was developed to provide a machining centre approach to deep hole drilling operations. The 5-axis, two-spindle

number of applications such as the production of water feed cavities in die and mould bases, off-centre hole and pattern hole drilling under CNC control as well as lighter duty secondary features such as counterboring and threadmilling. Table dimensions are 2,700 mm by 1,200 mm with a maximum loading up to 15 tonnes.

Mollart's capability to combine deep hole and conventional machining centre type applications within a single cycle has also been served through its 6-axis Centeplex.

The Centeplex has the capability to perform milling, drilling, boring and threading and extends the conventional horizontal spindle approach by inclining both the gundrill and milling spindles by 25 degrees. These are mounted under/over (shotgun style) and the +/- 15 degrees programmable swivel action creates an additional compound angle production capability. The machine has a deep hole drilling capacity between 6 mm and 80 mm diameter by up to 2,000 mm in depth. The ISO50 milling spindle is powered by a 22 kW motor with automatic toolchange. A 14 tonne table capacity will accept work up to 2,000 mm by 2,750 mm.



Mollart 6-axis Centeplex has under/over gundrill and milling spindles

## US automotive group orders a further five gundrilling machines

One of the largest independent automotive manufacturers in North America has placed an order with Mollart for gundrilling machines worth \$3 million. The five machine order for delivery in 2017 was won against US and European deep hole drilling competitors for producing oil feed holes in automatic transmissions.

Sales director Ian Petitt says: "The order increases job security at both our Chessington, Surrey, machine tool design and build facility and in our welding and fabrication areas based in the Resolven subcontract manufacturing plant in South Wales where the bespoke high pressure coolant and filtration systems are manufactured."

Mollart previously delivered nine gundrilling machines to the company in 2015. Ian Petitt adds: "The proven performance and up times being achieved



One of previous gundrilling machines under final testing for the same customer at Mollart Engineering's Chessington factory

following installation was also a major factor in the customer's decision to place the contract in the UK."

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# RDL is a Star subcontractor

When RDL Technologies Ltd was formed in 2000, the Leicester company had a vision of supplying high quality subcontract manufactured components. Seventeen years later the company is recognised as one of the UK's leading turned parts subcontractors, something that is largely supported by sliding head turning centres from Star Micronics GB.

In June 2003 RDL began its relationship with Star GB by purchasing its first Star sliding head machine, an SB-16C. This was followed in 2007 by the installation of a new Star SR-20RII increasing its capacity from 16 mm to 20 mm. In 2010, two more Star machines entered the machine shop, a second SR-20RII and a 9 axis Star SV-20 sliding head. In 2011, machine capacity was again increased from 20 mm to 32 mm with a Star SR-32JN and this was followed in 2014 by another Star SR-32JN together with SV-32. This gradual increase in dimensional capacity has now taken another step forward with RDL buying a new Star ST38 machine.

Lewis Lockwood, production control manager at RDL, says: "With 14 Star machines, this acquisition was the next natural step for us as it now gives us capacity up to 40 mm diameter. We can do multi-axis milling and balanced turning and it's a lot more powerful than anything else we've got in the machine shop."

Looking at the turret configuration as an alternative to platen tooling stations, Brian Chamberlain, senior programmer at RDL Technologies says: "This configuration gives extra flexibility. There are so many different tools and tool holders available for the turret and this allows us to do so many different things. We can do gear hobbing, gun drilling, polygon turning. The machine is something between a sliding head and a fixed head machine. Primarily it's a sliding head centre with a 350 mm stroke on Z1, but it also has a secondary Z3 axis that allows you to use it as a fixed head. We also have a JBS system on the machine, so we can clamp the JBS, clamping the bar and turning with Z3 and this improves the concentricity of the parts you are turning.

"With a sliding head sometimes, you turn the part and it's very difficult to go back as the material falls out the guide bush and you don't have the traditional support. However, when you have another Z-axis you don't have that problem. You can turn with Z1 and machine in a conventional manner."

Referring to the milling capacity of the powerful new Star ST-38, RDL is machining rectangular support blocks from round bar



on the ST-38. Lewis Lockwood continues: "Most people would think that the part was machined on a machining centre, but we can do it on the Star ST-38. Machined from EN16T, which is quite heavy duty, it shows the capability of the machine when machining this high tensile material. By doing it on the ST-38, we could machine the job through the night, which makes it more profitable for the company.

"We have another job that used to be machined on our Star SR-20II and then finished machined on a machining centre. We can now machine this type of part in a single setup on the ST-38, saving us considerable setup and machining time as well as enhancing precision."

Star Micronics GB is the wholly owned UK and Eire subsidiary of Star Micronics Co Ltd, which produces sliding-headstock lathes at its ultra-modern Kikugawa plant in Japan with headquarters located in Shizuoka. The GB subsidiary, in addition to supplying its parent company's multi-axis, sliding-headstock mill-turn centres, is also the sole UK agent for the entire range of FMB automatic bar feeders and JBS compensating guide bush systems from Germany.

Star Micronics is dedicated to supplying specialist CNC sliding head lathes. With a state of the art technology centre in Derbyshire, and an expert team of turning applications engineers, its sliding head lathes offer accuracy, repeatability, reliability and lower cycle times on turned parts.

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# Turning to Siemens

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has announced that it is now supplying, supporting and stocking Doosan lathes with Siemens 828 Controls and onboard ShopTurn conversational programming software.

Similar to its Siemens Control launch and roll-out programme for vertical machining centres, that the company initiated back in 2015, Mills' roll-out strategy for Doosan lathes will, in the first instance, focus on selected horizontal single turret machines starting with its popular and best-selling Lynx and GT2100/GT2600/GT3100 lathe ranges.

The introduction of Siemens-controlled lathes will increase the attractiveness of the Lynx and GT-series machines further especially amongst those UK and Irish precision component manufacturers who, in the past, decided against acquiring a Doosan lathe because it could not be supplied with their preferred control.

This move by Mills will enable the company to penetrate the Siemens control user market that was hitherto out of reach and, more importantly, will mean that manufacturers no longer need to compromise when it comes to investing in a high-quality, ultra-reliable and cost-competitive lathe.

Tony Dale, Mills CNC's technical director says: "We have always supplied Doosan lathes with the latest Fanuc Controls and will continue to do so. However, a significant proportion of UK and Irish manufacturers, especially those involved in machining high-precision aerospace components, prefer the Siemens Control systems.

"A few years ago, Doosan launched and began supplying Siemens controlled lathes to selected markets in Asia and Europe most notably Germany. The reaction within these markets to the initiative has been, and is, extremely positive.

"The steady growth in demand for Siemens controlled lathes here in the UK and Ireland has been the catalyst behind us now selling and stocking these lathes and we are confident that we will soon be acquiring and growing share of the Siemens' user market as a consequence."

To help Mills achieve its ambitions, the company has recently created a new resource at its technology campus facility in Leamington. The aptly-named 'control centre' is a dedicated and discrete facility located in Mills' machine tool demonstration area that will be used to help visitors and customers understand more about the different CNC control system options available on Doosan machines. The company's CNC training arm, the CNC Training Academy, has also been strengthened.



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## EMAG expands its modular product range

The success story of EMAG's modular machines continues. The modular machine concept was introduced by EMAG in 2011 and has become a favourite within the market. Starting with a focus on the development of vertical turning machines, in recent years, there has been the integration of the EMAG Group's full technology portfolio into this new machine model. Now, in addition to vertical pick-up turning centres for chucked and shaft parts, there are also machines for gear cutting, induction hardening, and hard machining. Combined with the TrackMotion automation solution, EMAG now offers these modular machines as modular building-blocks for entire production lines. In 2016 EMAG introduced two new modular standard machines to the EMAG product portfolio.

The modular machines are already optimised for maximum productivity due to its fully automatic manufacturing system which includes EMAG's "pick-up" technology, self-loading working spindle and integrated parts storage unit. In addition, there is a work turret with 12 tool positions, fully designed and manufactured by EMAG, and considered one of the best on the market. When combined with the machine base made out of Mineralit® polymer concrete, the result is an extremely compact machine tool that ensures top quality results and maximum productivity. As if these impressive features aren't enough, EMAG is now introducing the new VL 3 DUO, a dual-spindle machine that is redefining productivity.

### Compact, fast and precise

When you see the VL 3 DUO for the first time, you'll be immediately impressed by how compact the machine is.

Andreas Frank, product manager for modular machines at EMAG,



says: "Only 19 m<sup>2</sup> (204.5 ft<sup>2</sup>) is required for the full setup of the VL 3 DUO. For a dual-spindle vertical pick-up turning centre that's an outstanding figure especially considering that the machine features a storage unit for up to 400 workpieces and is completely automatic. These features make the VL 3 DUO one of the most compact and high-performance systems for chucked components in production."

With its range of parts up to 150 mm (5.9 in) in diameter, the VL 3 DUO is ideal for functions in transmission component manufacturing, for instance in the machining of blanks for gear production.

Andreas Frank continues: "Transmission components such as gears have to be produced in very high quantities. This is where the VL 3 DUO scores highly, especially with its short chip-to-chip times of about five seconds, depending on the workpiece geometry. It reduces idle times to a minimum and guarantees maximum productivity."

The new dual-spindle machine also impresses with its machining capability. It features two 18 kW main spindles offering up to 142 Nm torque. The offer is complemented by options including driven turret tools and measuring stations located outside the machining area. The extremely

robust machine design with recirculating roller guides offers an optimal basis for great surface finishes and minimal tool wear, and a direct measuring system that ensures a high degree of precision in all axes.

### A modular solution for the machining of gears

The VL 3 DUO forms part of the modular solutions which distinguishes itself through its modular design. This design makes the configuration of complex manufacturing systems simple. The VL 3 DUO is easy to integrate, as shown in the machining of gears, for example. The soft machining process of a gear covers four operations: turning OP 10 and OP 20, hobbing OP 30 and chamfering as well as deburring OP 40.

Andreas Frank says: "With the VL 3 DUO we are aiming, of course, at the first two operations, i.e. OP 10 and OP 20, in particular. These are ideal for the VL 3 DUO." The other operations can be carried out on gear-cutting machines, deburring machines and grinding machines for hard machining. All of these machines are also covered in the EMAG portfolio. The possibility and ease of configuring a production line with these machines is only one of the many advantages offered by this type of machine.



### Vertical hard machining of transmission components

While the VL 3 DUO provides maximum productivity for the soft machining of blanks for transmission components, the new VLC 200 GT guarantees cost reductions in the hard machining of planetary gear carriers.

The VLC 200 GT allows for the use of a variety of technologies for hard machining on a single machine, such as hard turning and grinding. Flexibility was a top priority with the VLC 200 GT, and consequently the machine's work area can be setup perfectly to suit each component being machined. The user can rest assured that the best technology for machining the workpiece will



be available every time, whether that is a turning turret or a block tool holder for hard turning or grinding spindles for external and internal machining. This means processes are optimised.



For example, the bore of a gearwheel can be finish-ground with a CBN wheel, while the end faces are hard turned. In both cases optimal surface finishes and the most advantageous cycle times are guaranteed. The machining quality is monitored by a measuring probe located between the machining area and loading station. In short, the VLC 200 GT brings not only cost reductions on all levels but also optimal machining results. This ensures a win-win situation for the user.



### From the raw part to the finished product

The simplicity with which the modular machines can be linked together using the TrackMotion automation system, the wide range of technologies offered, and the high productivity and quality of the individual machines make EMAG one of the most innovative suppliers of turnkey manufacturing systems in the marketplace. Anyone requiring this kind of manufacturing solution should contact EMAG UK.

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# Tradition-conscious family business uses CNC technology for machining

Suchanke GmbH is a family company, run by Ingo Suchanke, founded in Rheinfelden (Baden) 35 years ago. The company successfully stands its ground with customised, high-quality products for manufacturers from the processing and printing industry, but also for those from the area of vehicle construction and general engineering. Ingo Suchanke considers the direct, cooperative and trust-based communication with customers and employees as well as the priority of quality work crucial factors for long-lasting, successful business activities.

One key step was the investment in modern CNC processing technology. The commissioning of the Emco Maxxturn 110 x 2500 MY turning machine in 2011 and its versatile fields of application convinced the machining experts in Rheinfelden. Two years later, the managing director ordered two additional Maxxturn turning and milling machines. Apart from the quality of results, the flexible application potentials and the good price-performance ratio offered by the Maxxturn machines, it is also the service provided by the CNC turning machine partner that satisfies him.

### Innovative thinking

Since 1997, Ingo Suchanke has been assisting his father Gerd as a managing director. During this period, when national and global economic turbulences have



affected the mechanical engineering industry, he and his team, consisting of eleven members, have mastered all challenges.

Ingo Suchanke says: "In 1981, my father started with the orders of one single customer who has been commissioning us with the manufacturing of printing and embossing rollers. The company has been convinced by our quality work for decades now so that it is still one of our high-revenue business partners. By now we have expanded our range of technologies and hence also the solutions for our customers.

"The same applies to our clientele, our production area, our team of employees and, last but not least, our equipment with

modern machines. We have become more independent and more future-proof. Rollers for the production of embossed wallpapers, vehicle interior, wooden structures and other materials with profiled surfaces are our core competence. However, the pattern on the turned metal part falls within the responsibility of the designers and engravers. To ensure that these turned parts run with as little vibrations as possible and hence flawlessly, precision is always one of the main requirements. Until now we have always done well by exceeding these requirements instead of just executing the order specifications. Our rollers produced with high precision can also be re-engineered and re-used with a new engraving."

Ingo Suchanke continues: "The cylindrical roller has to match the material to be embossed, the mechanical forces acting on it as well as influences such as temperature, lifespan specifications or rotational speed. That is why most of these orders are custom products; series of no more than 70 pieces are the exception. The customer provides us with the design drawing and material data. We are in contact with them before and during the production. And our reliability, along with our expert experience, has paid off over the decades. In a similar way, this applies to the relationship with our employees: As a family business, we attach great importance to solidarity and fairness. Very soon, many of our colleagues are going to celebrate their 20th work anniversary."



The primarily stainless and high-strength materials are very expensive. Typical materials include St52, C45, 42CrMo4 as well as Hastelloy no. 4893 and 4856. Suchanke's employees mostly know the tools and cutting data to be used for the respective material or find these in the EDP documentation.

Ingo Suchanke says: "By now we have a lot of experience with the typical jobs of our regular customers, the respective materials and cutting data specifications. And if a client completed the data sheet with a material appearing extraordinary to us, we ask again. The same applies if parameters like the circumference of a roller, for instance, are stated with values according to which we have not yet produced. Thus, we work together to ensure that errors and the resulting costs are avoided. If repairs are necessary, we take care of them."

### New development stage with CNC technology

In 1989, the company moved into the newly-built production hall in Rheinfelden. According to the junior manager, it was a key moment in the history of the family company that had seen growth in his first



nine years. After another eight years, in 1997, modern process technology was introduced by a new CNC processing machine, followed by an Emco Maxxturn 110 MY in 2011.

Ingo Suchanke says: "These were highlights in our history. Everyday practice has shown us the many possibilities of the machine and taught us how to use them. We realised that we can do far more with this machine than with the traditional turning machines and also far more than expected. We were able to offer an expanded, more differentiated service profile, received enquiries that were more demanding from both a technical and an

economic point of view and have won new customers, from the furniture and automotive industry, for instance."

The news about the new CNC turning machine with milling options quickly spread among Suchanke's interconnected customers. The next capacity expansion was implemented in Rheinfelden as early as in 2013 with the acquisition of another Maxxturn 110 x 2500 MY as well as a Maxxturn 110 x 3500 MY.

Of course, the managing directors had thoughtfully considered their decision for Emco. Ingo Suchanke concludes: "I checked the offers of several providers and looked around at trade fairs, but Emco's division manager was very committed in demonstrating the live operation of the respective machine, which means he wanted to show us how it runs at the premises of a user in everyday practice. This user, a Swiss company, was very satisfied with the machine tool. The service and price-performance ratio add up as well."

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# Cennox boosts R&D performance with in house machining capacity

As a leading company in banking and retail support services Cennox plc, based in Camberley, Surrey, is at the forefront in the battle against card skimming at cashpoints, developing components and systems that help banks stay one step ahead of the criminals.

To maintain its lead, Cennox has an active research and development program that requires numerous parts to be machined with relatively short lead-times. In addition it also has production parts to produce in order to back up the service it provided to banks in repairing damaged cashpoints. In the past, all of this machining work was put out to subcontract, but as demand grew the cost and delays that this created was impacting on productivity. So the decision was taken to investigate bringing machining in-house.

Iain Ferguson, technical and operations support manager, explains: "We were faced with two challenges, the cost and delays of subcontracting all of this work and the fact that we had no experience at all of machining. As we would be starting from scratch we needed to find a machine tool supplier that would work with us to bring this project to fruition."

After investigating the market, Cennox chose Matchmaker CNC to supply the machine it required as well as providing extra support in pulling together a tooling and CAD/CAM package (Sharp CAM). The

choice of a Matchmaker VMC 1020 vertical machining centre, with its 1,100 by 560 mm table that allowed multiple setups to be in place at any one time was a big advantage to Cennox as some components require six operations and to have them all on the table simultaneously improved productivity and manufacturing costs considerably. Typical savings over subcontracting these parts is running at around 75 percent per component, with initial batches running at around 400 off, and ongoing batches between 20-30 off this is a major saving. Added to that is the elimination, almost completely of lost time while waiting for parts to be processed by a subcontractor, resulting in reduced lead times.

Given Cennox's lack of machining experience, part of Matchmaker's role was to provide some ongoing support through its applications engineering department, working alongside experienced R&D machinist/programmer, Craig Wilson, who was brought in to Cennox for this project.

Iain Ferguson says: "The help we received from Matchmaker was excellent. Craig machined our first parts in a cycle time of one hour 20 minutes and then tweaked the program, reducing that to 45 minutes per part and we were happy with that. Then,



sitting down with Matchmaker's applications team we have reduced cycle time even further, producing each part in 34 minutes."

Making use of the capability of the Matchmaker VMC 1020 the productivity at Cennox, compared to what was being achieved through subcontract is dramatically improved. With its 8,000 revs/min, 7 kW spindle and 10 m/min cutting feedrate capability and its Fanuc OiMD control system, it is making short work of the volume of parts required. Typically, its subcontractor would use two machines to produce 12 parts/day for Cennox. Now, with the single Matchmaker VMC 1020 in-house, Cennox is producing the same number of units per day with a marked improvement on dimensional accuracy and overall quality.

Iain Ferguson concludes: "Considering that our starting point was that of no machining experience whatsoever, we were probably a unique proposition for any machine tool company, given the size of our business. We therefore had to place a lot of trust in Matchmaker to supply us with a machine and support that would deliver what we needed. That trust was well placed, as we now have a machining facility that we are confident can produce anything that our design department comes up with and, deliver it in a very timely manner. The machine has delivered everything that we expected and the support from Matchmaker has made the whole project run smoothly from start to finish."



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## Advanced Mikron high-speed machining centres

Increased process stability, quality, and productivity are just some of the advantages precision mould and die makers can expect from GF Machining Solutions' Mikron MILL S 600 U 5-axis machining centres, now equipped with new high-precision HVC140 StepTec spindles.

The new Mikron MILL S 600 U machining centre is designed for mould and die makers looking to achieve high accuracies and to maintain unrivalled process reliability during lengthy and prolonged machining runs for example when machining high-precision multi-cavity moulds.

The machining centres, with their rigid base construction, combine high dynamic direct-drive technology with a range of design and build features and integrated on-board software. This ensures thermal stability and, as a consequence, guaranteed high precision and process optimisation.



These SMART software modules include: Ambient Robust which monitors and regulates thermal variation detected in the machine's base and drives; OSS (Intelligent Operator Support System) which helps customers optimise their machining processes based on workpiece specifications/dimensions and their specific machining priorities, speed, accuracy and surface finish; ITC/ITC 5AX (Intelligent Thermal Control) which eliminates the need for, or reduces the time required for warm-up cycles.

In addition, the Mikron machines are equipped with StepTec's HVC140 spindles which deliver high power and speed (13.5 kW/42,000 rpm), and feature proven OptiCool technology.

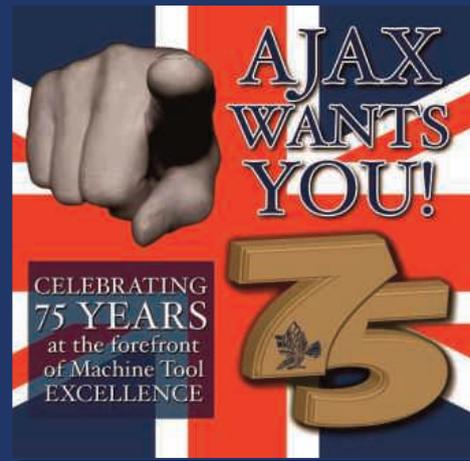
### StepTec spindles

The StepTec Opticool spindle system, with its enhanced polar thermal balance, controls the temperature of the machine's spindle and spindle bearings to improve part accuracies and surface finishes.

This spindle system, working in conjunction with the machines' Smart Technology software helps reduce spindle warm-up cycle times and ensures high accuracy and process reliability.

Also contributing to the spindle's performance is an all new bearing design using ultra-high precision ceramic hybrid bearings. As a result of the incorporation, radial and lateral stiffness are increased by 16 percent and 60 percent respectively and low radial and axial run-out, as well as repeatability, at the tool interface of less than two microns are achieved.

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# Making things better

## How developments in robotic machine tending will help secure the future of UK manufacturing

by Matt Rollins, ABB product line manager for machine tending products

Machine tending is any task which involves loading/unloading a primary machine. Machine tending is common across a wide range of manufacturing sectors. Many UK companies are still using human operators to manually load and unload and start and stop machines. However, increasing global adoption of smart technologies coupled with shortage of skilled operators is bringing change.

### Smart factory technology is the big game changer

The common theme is that existing technologies are brought together so that companies can produce quicker, better and more flexibly. Robot automation is a key smart factory technology. There is a misconception that smart factory technologies are only suitable for mass production typical of automotive. Growing trends for individualisation lead to a need for flexibility. There is a £1.5 billion potential UK market for manufacturing technology equipment.

The take up of robots in UK general manufacturing lags behind our leading international competitors. In 2015, 8,651 robots were used for machine tending applications in the UK, compared to 101,588 in Germany and 108,301 in Japan. There are, however, 608,920 engineering companies in the UK many of which are SMEs.

### Why is the UK lagging behind?

Misconceptions around robotic automation ABB surveyed 221 UK-based manufacturing companies in 2013 and the results showed a number of reasons why there is a reluctance to invest in robots. Robots were considered: only suitable for high volume production; not flexible enough to handle multiple products; automation is complex and requires a high level of skill to operate; installation is disruptive, time consuming and costly; payback doesn't fit in within acceptable ROI timeframe.

### Introducing ABB standard machine tending solutions

A range of standardised solutions designed from the ground up as machine tending



solutions which address all of the aforementioned challenges. These have evolved over ten years with almost 1,000 units in operation. Integrated into one neat package are: robot and robot controller; HMI; feed conveyor belts; buffers; vision system. Cells are standard items with proven reliability and ease of use which can be installed and commissioned in as little as a day.

### Benefits of robotic machine tending

There is a reduced need for skilled workers through improved utilisation of the existing workforce. One person can now supervise many machines and is no longer tied to a single machine. Operators can learn new skills through their involvement in programming. There is an improved working environment and automation also improves health and safety through a reduced injury risk.



Automated machine shops have machine utilisation of 80-90 percent. This compares with 45-50 percent for manual-based machine shops. It opens the opportunity for continuous 24-hour production and reduces time lost between batches compared to manual-based systems. Faster production helps to significantly improve cycle times.

### Low volume production processes

Part recognition and intuitive HMI makes

programming easy. Vision system enables products to be recognised in range of orientations. Easily adaptable, new products can be introduced in as little as ten minutes. Robotic machine tending also provides the flexibility to run much smaller batch sizes.

### Competitiveness

Robotic machine tending eliminates the need for a dedicated operator per machine. Operators are now free to perform other higher value tasks whilst supervising multiple machine tending cells. Production costs are reduced by producing more products from the same machines whilst additional batches can be run overnight and flexibility also enables a greater range of products in a short turnaround.

Flexibility and fast changeover offers ability to quickly respond to sudden variations in orders. Standardised pre-packaged cells, eliminates concerns around lifetime operation and support. Quick and easy to set up, cells can be in operation within a day.

### Conclusion

UK machine shops often ask: Why should I automate? Would you like up to twice as much productivity from your machines? Reduced production piece price? To be more competitive? To reduce wastage and materials sent for scrap? The ability to produce more? A safer and more attractive working environment?

These are the messages we're trying to educate the machine tending industry with today.

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# Lathes can be automated without specialist knowledge

Machine tool manufacturer DMG MORI has introduced a mobile robotic cell to automate its CNC turning centres. Called Robo2Go, it loads raw billets from a tray and unloads machined components automatically. The unit can be relocated easily by pallet truck to serve up to four different lathes sequentially on a shop floor.

Operation requires no specialist knowledge of robots, as graphics-based programming is via a Powertool app running directly in DMG MORI's proprietary machine tool control interface, CELOS. All the operator has to do is enter the dimensions of the workpiece, select the chuck and gripper, choose one of the pre-defined workpiece tray arrangements and start the automatic process.

Silvio Krüger, CEO of DMG MORI Systems, says: "As no expert knowledge is needed, this intuitive way of programming a robot is especially suitable for small and medium-sized enterprises that want to exploit the competitive advantage of flexible, unattended production.

"Reluctance to automate has been

noticeable in this customer segment, partly because of a lack of programming knowledge and also due to uncertainty that the robot would be fully utilised.

"It caused some to regard such an investment as too risky, but the simplicity of Robo2Go has overcome this obstacle."

The low-cost equipment allows free access to the working area of the lathe for setting up. Once the system is working, a laser scanner prevents the operator from approaching the machine or robot, so there is no need for physical guarding. If a person encroaches on the periphery of the defined safety area, robot motion slows, while close approach halts movement instantly.

The robot is available with a maximum load capacity of 10 kg, 20 kg or 35 kg. Workpiece diameter can be between 25 and 125 mm and length is from 50 to 250 mm. Workpiece tray weight capacity is 700 kg. Included in the purchase price of the cell are



an automatic door for the lathe, automation interface, CELOS Powertool app and commissioning.

A video of Robo2Go in operation can be seen at: <https://www.youtube.com/watch?v=9mIFLnU8EcE>

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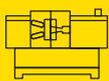
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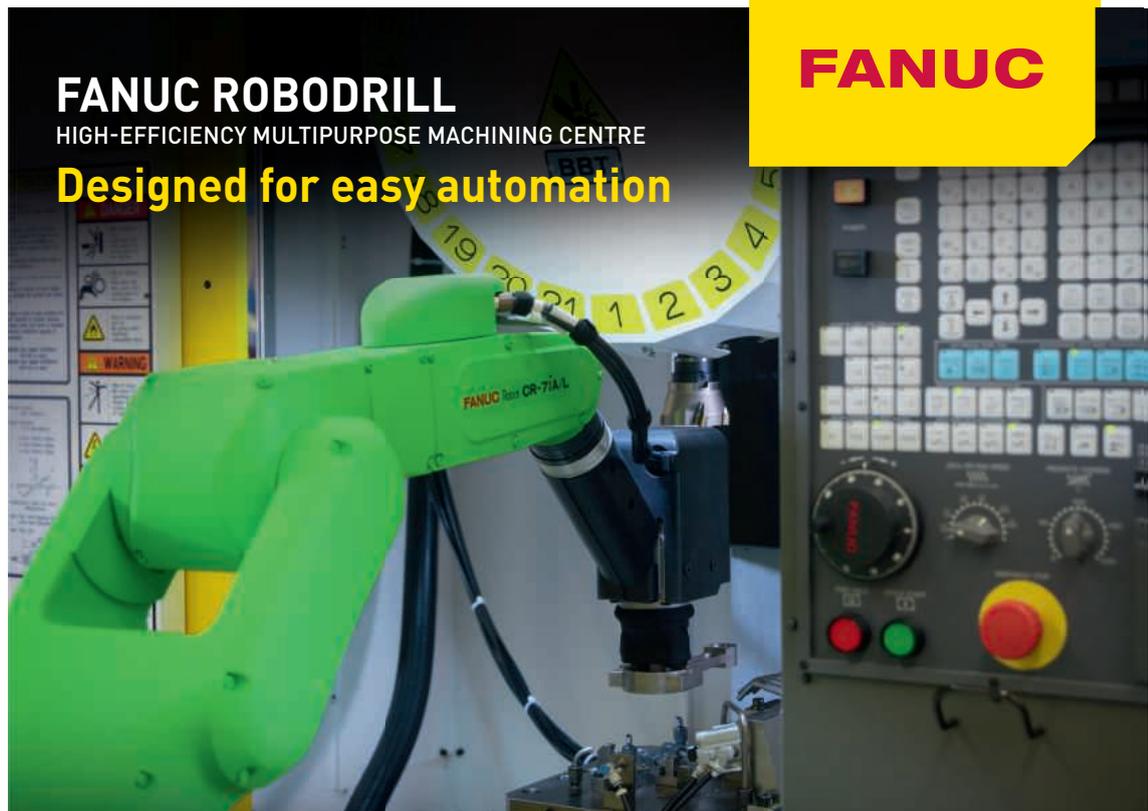
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# Sheet metal storage system raises subcontractor's productivity by a quarter

Sheet metal subcontractor Keller Blechtechnik, based in Endingen, Southern Germany, has increased its productivity by more than 25 percent thanks to ongoing investment in automated storage, retrieval and handling of material. At the same time, material availability has improved and scrap has been drastically reduced.

The firm, which employs over 40 people, was started as a forge and blacksmith's workshop in 1901 by the great-grandfather of the current managing partner, Harald Keller. He joined the company in 2001 and has overseen a rapid progression towards the supply of sheet metal parts and assemblies to customers in such diverse industries as automotive, food production, medical, pharmaceutical, agricultural, solar and general mechanical engineering.

The extensive customer base continually presents challenges due to the wide range of different materials that need to be supplied. Previously, they were stored at several different locations, which made planning, transport and handling time-consuming. Today the situation is very different. With the help of KASTO, Keller created a made-to-measure storage and material flow solution that he designed as the final project of his technician's training course.

The automated sheet metal storage and loading system fitted to the laser cutting

machine is supplied directly with material from a KASTO Unitower B 3.0 computer controlled sheet metal storage system, which has 89 pallet storage locations.

The pallets hold 3,000 x 1,500 mm sheets and can accommodate a stack 90 mm high of different sheet types, mainly steel, stainless steel and aluminium in thicknesses from 0.5 mm to 20 mm. Each location has a load capacity of three tonnes, so around 270 tonnes of sheet metal are available for immediate delivery.

The storage system offers high availability, so the company can react quickly to customer needs and priorities. To transfer system pallets to and from storage and to supply sheets directly to the loading system of the laser cutting cell, the system has one station with a transverse carriage and one with a longitudinal carriage. To allow unpacked sheet to be loaded and unloaded by forklift truck or crane, the transverse



carriage is equipped with a hydraulic piston lifter.

The longitudinal carriage has a drop-off position for transfer of system pallets to and from storage and the return of pallets that are no longer needed during laser cutting. Both stations and carriages have an optical contour monitor to ensure safety in any pallet loading status and prevent malfunctions.

The operating gantry crane is responsible for pallet and sheet handling. It operates at a maximum speed of 22 m/min in the vertical direction, while pallet push/pull speed is 20 m/min. The KASTO EasyControl can be operated automatically or manually and handles order management for the complete storage system. There is also an interface to the laser cutting machine's loading system to ensure smooth material transfer.

Martin Stöckle, sales team leader at KASTO, describes the ingenious solution



installed at Keller Blechtechnik: "By using the standard versions of the Unitower B 3.0 sheet storage tower and adapting the arrangement of the transverse and longitudinal stations, we were able to design a very compact system.

"The space available was limited due to the layout of the laser cutting cell and other equipment. So we suggested installing the tower store behind an existing wall to transport the pallets to the loading system area by the shortest possible route."

This minimises delivery times, so the laser cutting machine can be operated almost continuously during the 1.5 manned shifts and unattended for the remainder of the 24 hours. Overall, a significant increase in productivity of around 25 percent has been achieved compared with previous material storage practices. In addition, the ability to keep track of the material inventory has enabled the company to optimise its stock levels and reduce scrap.

Harald Keller concludes: "As well as increasing productivity by a quarter, the risk of material damage caused by frequent handling and transportation has been minimised. Additionally, working conditions for our staff are safer and more convenient.

"We have improved the utilisation of the laser cutting system thanks to shorter idle times and have eliminated transport from external storage locations and hence the need for weather protection.

"We now have a compact, cost-effective, 3D storage solution for a wider range of materials and therefore better availability to respond quickly to customer requirements."

KASTO develops and produces semi-automatic and fully automated bar stock and sheet metal storage systems to meet a wide range of requirements: from compact, standalone storage towers up to fully automated high-rack honeycomb systems with thousands of storage cassettes.

KASTO's product range also includes sawing centres or combined storage solutions, which handle all storage, handling, sawing, marking, palletising and bundling processes completely automated, starting with the loading of raw material to the robot-assisted commissioning of then cut parts. Customers from a variety of industries like steel service centres, mould and die, automotive, oil and gas, aerospace as well as general workshops therefore benefit from the full range of equipment for

the provisioning, production and distribution of material from a single supplier.

In order to provide the best possible support to users in all parts of the world, KASTO has established a comprehensive marketing and service organisation and collaborates with long-standing and experienced partners worldwide. Furthermore, the sawing and storing technology specialist has subsidiaries in France, the United States and the United Kingdom. The company's overseas sales have been growing steadily year-on-year and already account for over 50 percent of total revenue.

KASTO were represented in the UK by Rivers Machinery for over 30 years. In 2005, Rivers Machinery was bought out by KASTO GmbH, and KASTO Ltd was formed.

In 2009, KASTO Ltd relocated from its southern base in Southampton, to Milton Keynes, in order to have a central location to all of its customers.

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## Interpack sees launch of new FANUC flexible robot controller

FANUC, the global manufacturer of factory automation solutions, introduced a new robot controller, which will facilitate the integration of automation and robotics processes, at this year's Interpack in Germany.

The controller, known as the J-30iB, uses core FANUC robot technology to provide an easy-to-operate solution that can increase productivity and decrease downtime for manufacturers.

The J-30iB is able to coordinate multiple machine axes operating simultaneously, helping to facilitate complex project engineering and servo axis positioning integration tasks.

The controller's flexibility means it can be applied to any automation or robot integration requirements, while providing a consistently high level of precision and control. It is also compatible with existing software functions of FANUC robots, including industrial field bus systems.

FANUC's newest controller will be available in three standard configurations. It

can also be configured for individual automation requirements.

Thomas Schneider, product manager, material handling and vision at FANUC, says: "The J-30iB controller will help manufacturers improve their business agility and productivity due to its complete motion control and flexibility of application."

Andrew Armstrong, sales and marketing manager, adds: "All FANUC controllers operate on the guiding principles of precision, control and ease-of-use, and the J-30iB model will be no different. In addition, it also offers manufacturers the flexibility to use it on any existing automation or robotics systems, while simplifying complex, multi-axes machine motions without the need for extensive programming."

At its new state-of-the-art headquarters in Ansty Park, Coventry, FANUC UK brings together world-leading capabilities in industrial robots, machine tools and plastic injection moulding machines to facilitate the complete integration of factory automation



systems for UK manufacturers.

FANUC UK works in partnership with FANUC Europe Corporation to provide a range of customer support services, including sales, product support, parts, repairs, and training, as well as development of bespoke engineering systems. FANUC UK is a subsidiary of FANUC Europe Corporation and employs approximately 107 staff.

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# Grooving insert can be indexed six times

A six-edged, indexable grooving insert for turning has been added to the Horn family of carbide tooling. The 64T precision sintered inserts are available with a grooving width of up to 3.29 mm, with geometry .00. Grooving depths up to 3.5 mm is possible and maximum workpiece diameter is 65 mm.

As a neutral grooving insert, the 64T can be used on either the left or right-hand holder measuring 16 mm x 16 mm, 20 mm x 20 mm or 25 mm x 25 mm with internal cooling. A clamping screw system holds the insert accurately in the pocket ensuring rigidity and repeatability.

The new grade, EG55 high-performance coating considerably improves tool life and makes the grooving insert the perfect all-round choice for machining most types of steel as well as a wide range of other materials.

Application areas being promoted initially are grooving and parting off for widths of 1.0 mm and 1.5 mm, turning circlip grooves from 0.57 mm to 3.29 mm wide, and grooving using full radius inserts with radii of 0.5 / 0.6 / 0.8 / 1.25 / 1.5 mm.



The new Horn 64T six-edged grooving insert

### Modular thread whirling with turbo options

Tooling manufacturer Horn has introduced tools for thread whirling, having six or nine inserts, providing an efficient, cost-effective way to produce single- and multi-start external threads and profiles. Very short cycle times are achievable when they are used on sliding-head (Swiss-type) lathes and the process offers other



Horn has introduced a modular thread whirling system and turbo whirling options with three roughing inserts and six finishing inserts per tool cassette

significant advantages over single-point thread cutting. With its base carriers and ring cassettes, the new type M271 modular tool system offers a multitude of combinations tailored to the various Swiss-type lathes and drive units on the market.

The S271 high-precision system allows customers to choose between conventional whirling with six or nine indexable inserts per ring cassette or the new Horn turbo whirling method, which uses nine precision-ground, double-edged indexable inserts. Three are for roughing, the remainder being finishing inserts, and all are tailored to the thread profile and material to be machined. Each cutting edge is subject to equal load, an additional factor in extending tool life.

Inserts are held accurately in place by a Torx screw, achieving maximum rigidity and precise indexing. Thus handling is optimised during insert replacement in the new modular whirling heads or conventionally in Mono block tools.

A tool configurator, which is available on the Horn website at [www.phorn.de/en/products/milling/thread-whirling-tool-systems](http://www.phorn.de/en/products/milling/thread-whirling-tool-systems), facilitates choosing the right combination of machine, drive unit and tool. The correct cutting data is also provided thanks to the new HCT cutting data calculator, which can be accessed via the same page.

Horn Cutting Tools Ltd. Ringwood, is the wholly owned UK subsidiary of Horn S.A. Luxemburg, Europe's leading supplier of grooving tools and a world leader in precision grooving technology. The company was incorporated in the UK in 2008, having previously traded as Horn UK since 1995. Since 1996, the UK operation has had local tool design manufacturing capabilities. These were significantly increased following major expansion of the Ringwood site in 2004, and further enhanced in 2006 with additional facilities dedicated to the manufacture of customised tooling.

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## New Seco face milling cutter body doubles tool life

Seco Tools' new R220.88 face milling cutters feature inserts with eight cutting edges and optimised geometries that help reduce cutting forces and significantly increase tool life.

R220.88 cutter bodies have been designed with a 88-degree lead angle that enables large depths of cut to be taken using smaller-sized inserts, with 8 cutting edges per insert, making the range more flexible and particularly productive when machining close to workpiece sidewalls and clamping fixtures.

Designed for roughing and semi-finishing operations, R220.88 cutters are ideal for machining cast iron and steels and, as such, will be of interest to automotive component manufacturers, to name but a few.



The cutter body is made of Idun, a low-wear, corrosion-resistant, workable and tough stainless steel that provides longevity and durability. The material is also environmentally friendly as its manufacture does not involve using the nickel coating process.

R220.88 cutter bodies are available in different diameters, 50 mm to 160 mm diameter bodies use size 12 inserts, and 63 mm to 160 mm diameter bodies use size 16 inserts. Each diameter is offered with both standard pitch and a close-pitch variants to increase their appeal to manufacturers.

Size 12 R220.88 cutter bodies achieve a maximum depth of cut of 9 mm, whereas Size 16 bodies deliver an impressive 13 mm maximum depth of cut. Right-hand versions of the cutter body are available as standard with left-hand versions also being available by special request. The availability of both options enable manufacturers to use them in dual spindle machines performing simultaneous milling operations.

R220.88 bodies are compatible with Seco's SNMU inserts, which are secured by centre locks or screws, eliminating the need for wedges to secure the insert in the pocket.

The eight cutting edges on the inserts have double-the-tool-life over inserts with four edges and, as such, help reduce tool inventory and costs. With their neutral design, SNMU inserts can be applied in right-hand or left-hand milling operations.

Insert geometries available include M10 and MD13 for Size 12 - and MD10 and MD16 for Size 16. Insert grades include MK1500, MK2050, MP1500, MP2500, MS2500 and F40M.

An integrated wiper flat ensures a good surface finish for semi-finishing applications, and optimised geometries for reduced cutting forces with the M10.

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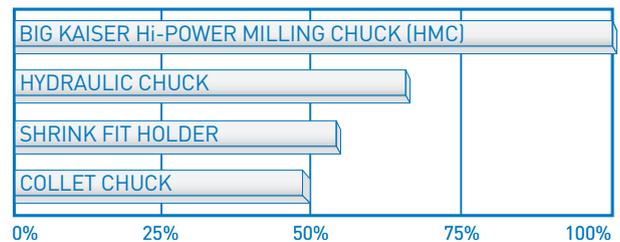
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# Walter GB customers hit the jackpot with new Tiger.tec gold milling inserts

A number of customers across varied industry sectors are already striking it rich with the new Tiger.tec Gold cutting inserts from tooling expert Walter GB in a range of rough and finish milling operations.

Recently announced by Walter GB, Tiger.tec Gold features a new and innovative titanium aluminium oxide (TiAlN) coating process that revolutionises carbide insert performance by offering staggering increases in tool life compared to inserts coated using the conventional chemical vapour deposition (CVD) process.

Tiger.tec Gold inserts additionally boast higher wear resistance on flank faces, reduced hairline cracking, a greater resistance to plastic deformation and improved process reliability.

Walter's high levels of expertise and claims of increased productivity are being proven in the field, with Tiger.tec Gold outshining tooling from competitors. This highlights how, together with customers, Walter GB will always find the best solutions.

The subcontractor to the rail and energy



industries used the new inserts in conjunction with Walter's M4000 universal milling system on a comparative finish milling operation. The 8,000 revs/min vertical machining centre was run at similar speed and feed rates (251 m/min and 751 mm/min) on the S275 brake level assembly workpiece.

However, the massive 400 percent increases in tool life and tool cost reductions of 69 percent achieved with Tiger.tec Gold also involved a 51 percent saving in cost per edge, a 78 percent reduction in tool change times and the release of effectively 13 hours of machine capacity over a year.

For 45 degree face milling of EN24T steel shafts on a 12,000 revs/min horizontal machining

centre at a supplier to the aerospace and automotive sectors, Tiger.tec Gold was run at different speed and feed rates of 180 m/min and 1,074 mm/min compared to 100 m/min and 353 mm/min with the competitor's insert.

The resulting operational cost savings of 71 percent were made up of increased metal removal rates, by more than 150 percent, and a 73 percent reduction in tooling costs, and over a year the use of Tiger.tec Gold on this operation alone would release 31 hours of machining capacity.

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# ITC extends the reach of its industry leading end-mills

The new edition of the Industrial Tooling Corporation (ITC) product catalogue now has a section dedicated to trochoidal milling; such is the industry attention to this machining strategy. Leading the new section of the 2017 product catalogue is the enhanced range of the 5021 Series of solid carbide end mills.

The new section of the ITC catalogue is packed with innovative new developments for trochoidal milling and the enhanced 5021 Series is at the forefront of this technology. The 5-flute solid carbide end mill has proven time and again to improve tool life and productivity through its ability to increase machining speeds and feeds. Previously available as square-end geometry, the Tamworth cutting tool manufacturer has now introduced a complete range of corner radii for the Cupro Coated end mills.

Currently available as a square-end option in diameters from 3 to 25 mm, the new corner radius additions to the 5021 Series include a corner radius of 0.25 and 0.5 mm on the smallest 3, 4 and 5 mm diameter tools whilst the 6 mm diameter cutter also offers a 0.75 and 1 mm radius. The larger tools that include the 8, 10, 12, 16 and 20 mm diameters all include the 0.25 mm increment corner radii up to 1.25 mm with radii above 1.5 mm stepping up in 0.5 mm increments. This gives the 20 mm cutter a huge range of radius options with 10 standard variants available from the catalogue. Of course, as a UK manufacturer ITC can process the corner radii on the 5021 Series to meet the needs of the end user.

Incorporating a harmonic flute design for reduced noise and vibration, the 5021 Series also improves tool life and surface finishes with its ingenious flute design. The combination of the harmonic flute, the extra long-life Cupro coating, the centre cutting geometry and the extended flute length makes the extended 5021 Series ideal for trochoidal milling operations on a wide variety of steels and exotic alloy materials.

The geometry of the 5021 Series and the polished harmonic flutes make the enhanced range the perfect choice for reducing temperature during machining. This is achieved by creating a consistent

chip thickness with improved swarf evacuation. This smooth machining of the 5021 Series enables the end user to reduce the engagement angle when trochoidal cutting whilst maximising the use of the full flute length to reduce cutting edge loads as well as torque and power requirements on the machine tool. This ensures consistent performance under the most demanding machining applications.

To give these benefits to customers machining deep cavities, ITC has made the 5021 Series available with an overall length from 58 to 150 mm with a flute length from 9 to 40 mm. For further information on how to improve your machining performance, reduce your tooling consumption and costs and also reduce the stress on the spindle of your machine tools, contact ITC for more information on the enhanced 5021 Series.

**Industrial Tooling Corporation Ltd**  
**Tel: 01827 304500**  
**Email: [sales@itc-ltd.co.uk](mailto:sales@itc-ltd.co.uk)**  
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# Complete tool presetting solutions with new Alfa-Sys range

The tooling and workholding division of manufacturing technologies equipment supplier, YMT Technologies, recently announced the launch of the full range of Alfa-Sys products that are designed and fully developed to aid machine shops accurately and efficiently achieve the build-up and presetting of cutting tools. The Yeovil-based company is the exclusive UK and Eire agent for the complete Alfa-Sys range that is produced at the company's impressive facility in Liechtenstein.

Supporting the end-to-end process of building and presetting cutting tools, the range starts with the Alfa-Clamp. This new tool assembly device provides a simple and



elegant solution to the needs of machine shops trying to efficiently pre-assemble the spindle tooling, cutting tool body and indexable inserts. The unit can be specified with 90 degrees or 45 degrees incremental locking points and is secured to a bench or work surface to provide a stable tooling assembly station. Quick-change spindle taper matched holders slide into the unit, with all popular designs, such as BT/CAT, Capto, HSK-A, VDI and KM tapers, available. Taking just a few seconds to change between different tapers will be crucial to any workshop operating a variety of machine tools, saving both time and capital expenditure.

Once assembled, the cutting tool can be accurately preset using one of the comprehensive range of Alfa-Set units. The presetters can be bench-top or free standing, and feature contact free high accuracy vision systems to measure the exact location of each cutting tool insert, as well as the tip geometry. A TFT touch-screen provides measurement options, feedback and graphical confirmation.

Jason Short, YMT Technologies' Tooling & Workholding Division manager, says: "Tool presetting offers a number of advantages for any workshop. With accurate tooling offset data supplied to the CNC machine, programs can be run at an optimal level, knowing that components produced will be within tolerance. Tool wear is reduced and the structure of the machine tool has less chance of having to absorb extreme cutting forces."

"From experience, we know a tool can be preset in around three minutes using the Alfa-Set units. This time saving, added to the previously stated benefits, results in a quantifiable cost saving for any manufacturing business. We can demonstrate savings of between £10,000 and £30,000 per year for shops running four or six machines."

For bench-top users the Alfa-Set 33- and 35-Swift can measure tools up to 250 mm diameter by 380 mm long for the 33-Swift and 500 mm long for the 35-Swift. The 6-inch touch screen unit has fixed and floating crosshairs for automated measurements. All cutting edge profile data points, including any radii and angles, are measured and indicated within just 1 second. Measuring programs for radius, angle and distance can be loaded and up to 99 reference zero points can be set.

Offering even more functionality, the free-standing Alfa-Set 23/44/64 units can measure a comprehensive range of tool



assemblies up to 600 mm diameter for the largest and up to an impressive 900 mm long. Like the Swift range these units are designed for ergonomic use and built for maximum mechanical stability. Tool loading and unloading is unimpeded and adjustments to the measurement settings can be carried out with just one hand.

A state-of-the-art high-resolution CMOS camera with a fully developed image processing system is fitted as standard. With colour reflected light imaging used for automatic contour recognition and for inspection of the cutting edges. However, even more functionality can be specified with increased magnification options as well as measuring programs for the non-contact checking of fluted cutting tools.

An additional X-axis fixed camera with LED incident lighting can also be added to automate the measurement of the centre height on turning tools. To measure helical angle, wear, spacing and other axial and radial geometric data a second swivelling camera with incident lighting can be installed.

**YMT Technologies**  
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## New insert grade for steel turning under unstable conditions

Optimised solution to overcome instability, vibration and heavy interruptions in steel turning applications

Cutting tool and tooling system specialist Sandvik Coromant has introduced its GC4335 insert grade for the turning of steels where unstable conditions or vibration issues prevail. GC4335 is designed to bring about secure and predictable machining, as well as shorter cycle times and better machine utilisation through reduced stoppages and longer insert life. Customers will benefit from an improved process with less risk of insert breakage, as well as reduced cost per component and faster return on investment.

GC4335, which features Inveio™ coating technology for maximum thermal protection, offers greater steel turning endurance through improved edge-line security in comparison with the previous-generation grade, along with greater resistance to flank wear, plastic deformation and crater wear.

Bimal Mazumdar, turning product manager, says: "The new GC4335 is particularly suited for uneven forged surfaces, the turning of which can lead to frequent insert changes due to fatigue and failure. Slowing down an operation to replace a broken insert means less production. When production is slower, fewer parts get completed per cycle and that affects overall profitability."



Among those set to benefit from the introduction of GC4335 are general engineering shops, as well as automotive OEMs and tier suppliers and subcontractors in the oil and gas sector. Typical components include tubes, valves, crankshafts, differential housings, flanges and rings to list a few.

Underlying reasons behind the performance of GC4335 include a new substrate that is well balanced between reliable toughness and resistance to plastic deformation. In addition, a new alumina coating delivers efficient heat transfer from the cutting zone to act as a heat barrier and the columnar MT-TiCN inner coating offers improved resistance against abrasive wear. A yellow TiN coating on the insert flank allows for easy wear detection.

To highlight the potential gains, an external face-turning application in dry cutting conditions saw GC4335 outperform a competitor insert on unalloyed steel, 220 HB, delivering 3647 completed components in comparison with just 1980, an 84 percent increase. The time in cut for this finishing operation was two seconds per component, while cutting speed was 145 m/min (475 ft/min), feed rate was 0.4 mm/rev (0.016 in/rev) and depth of cut was 0.35 mm (0.014 in). Equally significant gains are achievable against GC4235, the previous generation insert grade from Sandvik Coromant.

The GC4335 assortment is available in T-Max® P and CoroTurn® 107. For more information, visit:

[www.sandvik.coromant.com/en-gb/products/turning-inserts-grades-steel](http://www.sandvik.coromant.com/en-gb/products/turning-inserts-grades-steel)  
Sandvik Coromant's knowledge page for general information and guides on turning.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3100 patents worldwide, employs over 8,500 staff, and is represented in 150 countries.

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#### The ideal candidate will have the following skills and experience:

- Significant experience of working with Siemens NX would be a distinct advantage
- Experience of CAD CAM Programming of machining centres in a busy sub contract environment
- The knowledge and ability to select the correct tool and toolholder and apply suitable cutting data
- Be able to produce programmes to enable manufacture of components to drawing tolerance and specifications efficiently and accurately as required by the customer
- Be a fully competent CNC Programmer – CAD CAM Programmer
- 3, 4 & 5 Axis experience required
- Ability to work on own initiative within a busy environment

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# Clamping force blocks offer sufficient potential for process optimisation

For many decades, vices and clamping force blocks were said to be indispensable helpers in production. Their basic principle is still unchanged. Workpieces are clamped between two chuck jaws so that their position remains unchanged, even under high force applications, but the basic requirements of modern vices go much further. They fix the parts fully automated within seconds, ensure a high degree of flexibility, and a direct process monitoring at the component. Intelligently used, they are the key factors on the way to highly efficient processes.

For getting an impression of the manifold application scenarios of modern clamping force blocks, it is preferable to look at the program of TANDEM plus clamping force blocks from SCHUNK. The company combines durable, compact, versatile precision clamping force blocks with a slim profile in one single series. Workpieces can be clamped quickly and fully automated at a high clamping force, or depending on the version, they can be manually converted. The program comprises more than 50 standard variants. The spectrum includes manually, pneumatically or hydraulically actuated versions up to spring-loaded vices for the use in media-free workpiece storages, from sizes 64 to 250 mm, from standard-to-long-stroke versions, up to



vices with fixed jaw. SCHUNK TANDEM plus vices are suitable for top jaws with tongue and groove and for jaws with fine serration.

### Advantages of the modular system

The modular design opens up various new fields of application. Regardless of whether it is fully automated small parts clamping, the use of palletising systems or combined clamping of long parts, SCHUNK falls back to the identical core components time and time again. This provides a first-class economical option to users, reduces the spares inventory, allows fast adaption to new circumstances and ensures manifold possibilities of further use after a program change. With its square base surface and its

compact dimensions, the vices permit a dense arrangement. Numerous parts can be prepared for the application on the tombstones deposited in a workpiece storage and they can be exchanged in the machine at the same time.

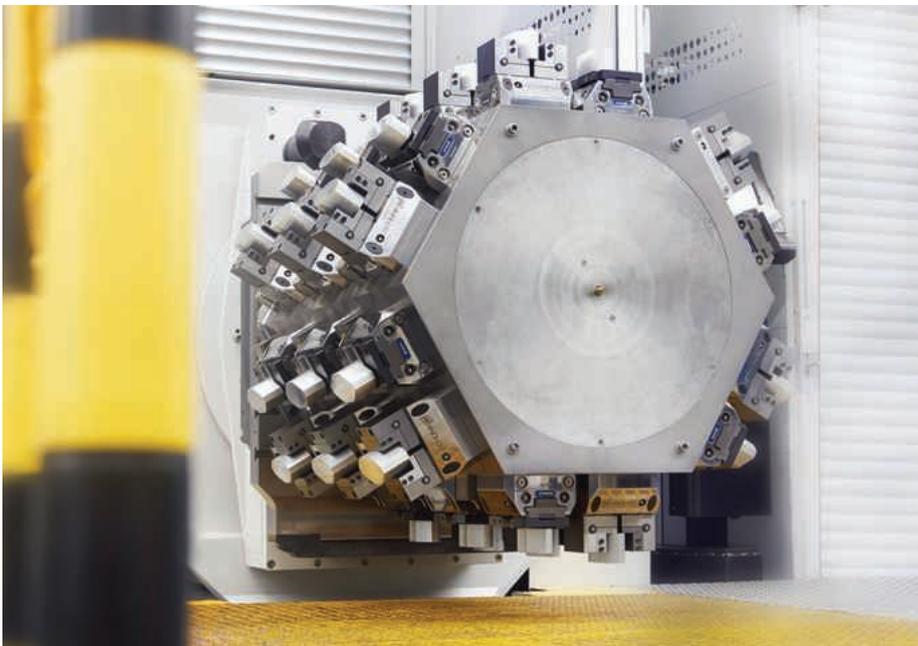
### Wide spectrum of application

Where there are many possibilities and a wide range of applications, power vices come into play. They can be used on base plates for machine tables, as well as on tombstones, rotary tables, 3-way pyramid brackets, multi-clamping vices or clamping pallets and can be horizontal, vertical or upside down in 3,4 or 5-axis machining centres. They can also be used in transfer or revolving machines, in the tightly scheduled mass production, but also on pallet systems for manufacturing smaller and medium lot sizes.



### Sophisticated clamping technology

The SCHUNK TANDEM plus clamping force blocks are setting the standard with the synergy of compactness, clamping force, and precision. Their one-piece, rigid base body, the wedge hook kinematics and the long, ground jaw guidance ensure concentrated clamping forces of up to 44 kN in confined spaces. At the same time, they ensure an excellent repeat accuracy of up to 0.01 mm. They are also suitable for demanding milling operations with a high metal removal rate, high number of cycles and minimum tolerances. The optimised outside contour is a special design of base jaws and cover strips, and the minimum gap dimension and cover plugs for fastening screws prevent the build-up of dust pockets or chips in the vice which might cause permanent residue. Special fitting screws



ensure that the vice can be exchanged at a high repeat accuracy. All the versions are equipped with a dual lubrication system, and the jaw-, piston guidance and the diagonal pull can be optionally supplied with grease by hand with a high-pressure grease gun or centrally through the connection on the bottom. Penetrating coolant is drained to the outside through coolant drain holes. A sinter filter prevents the buildup of chips in the chuck body.

## Short setup times are paired with high precision

The different jaw quick-change systems are unique on the market. They transform the SCHUNK TANDEM plus clamping force blocks into more flexible and precise powerhouses. The tool-free jaw quick-change system SCHUNK BWM reduces the time for a complete jaw change independent from the position of installation to less than 30 seconds when it is combined with the compact and high-performance SCHUNK TANDEM KSP plus clamping force blocks of the sizes 100, 160 and 250. The repeat accuracy amounts to 0.02 mm. Since the base and change jaws are connected with each other through an integrated diagonal pull, the interfering contour of the vice remains unchanged. A spring mechanism ensures that the change jaw will not fall out when



opened. Since the locking can be optionally opened from above, behind or from both sides, the setup time turbo can also be used in confined spaces without any limitation. A smoothly running drive ensures simple operation. The quick-change system is suitable for standard jaws, clamping inserts, and workpiece-specific change jaws.

With the support jaw system SCHUNK TANDEM TBA-D in turn it is possible to cover complete clamping ranges for the stationary workpiece clamping by using clamping inserts from the SCHUNK standard chuck jaw program. Instead of



needing many different special jaws, the user just needs some standard inserts and the TANDEM TBA-D support jaw system. This reduces the investment volume and the implementation time for the matching clamping solution to a minimum. Due to the standard interface, various jaws for raw and finished parts clamping are available: Grip jaws, stepped jaws, prism jaws, soft jaws and jaws with pull-down function, with T-groove and many others. The support jaw is mounted with four screws on the base jaw of the clamping force block ensuring maximum rigidity. With the fine serration, the jaws can be flexibly varied in position in a few simple steps.

SCHUNK TANDEM TBA-D is available in three sizes for clamping ranges from 8 mm to 70 mm, 18 to 120 mm or 30 to 200 mm. It is suitable for outside clamping on TANDEM plus clamping force blocks of the sizes 100, 160 and 250. The BWM and TBA-D can be retrofitted any time, if required, which ensures a high level of investment security.

## Efficient automation

The SCHUNK TANDEM plus vices demonstrate their greatest strength in applications of automated loading. TANDEM KSA plus clamping forces can be automatically actuated by active base plates (ABP-a) or by base plates with fast coupling (SBP), or can be externally controlled. Actuation is done by an electric signal, which releases the actuation with compressed air or through a direct actuation with compressed air. The base plates allow separate actuation of several clamping blocks and this connection ensure efficient processes, particularly if other clamping blocks are loaded in parallel to the ongoing process, so that in an extreme case a 24 hours/7 days a week operation can be achieved, without very little interruption.

Particularly when used in automation loading processes, the TANDEM plus

clamping force blocks, with fixed jaw, ensure that the zero point is immediately and exactly defined, which prevents a shifting of the reference point. Moreover, the clamping force blocks of the same version can be connected in series, allowing the clamping of long parts such as profiles. As an option, the vices with fixed jaw can be pneumatically actuated (version KSP-F plus) or hydraulically, (version KSH-F plus). In order to ensure maximum flexibility in automated applications, the individual TANDEM plus vices or complete pallets with several vices can be exchanged with one interface to the SCHUNK VERO-S quick-change pallet system in just a few steps, and are centrally controlled. The machines can be retrofitted extremely fast and therefore process-reliable.

## Intelligent networking for the Smart Factory

In terms of Industry 4.0, SCHUNK has set itself the goal to benefit from the position of its gripping systems and clamping units, "closest-to-the-part" in order to monitor each individual process step, and to permanently supply the system control and the higher level ERP system with process data. Starting at vice size 100, the pneumatically actuated TANDEM KSP plus clamping force blocks can be flexibly detected over the complete jaw stroke today. Whether its ID or OD clamping, the positions of either opened or clamped can be adjusted in a few steps. Monitoring is done by two inductive proximity switches, which are integrated in the special slots of the base jaws. The system is self-contained and resistant against dirt.

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# Rising to the challenge at Unicut Precision

As one of the UK's leading contract manufacturing businesses, Unicut Precision has built its reputation on rapid response to customer demands, on-time delivery and its engineering expertise that, over the term of a contract, will see costs driven out of components. For it to deliver on its promises, it also relies on its suppliers to provide similar levels of service. Therefore, when faced with a new challenge, Unicut turned to WNT (UK), which stepped in with a rapid response.

Unicut Precision has built its reputation on the back of its high quality turning capability, with its extensive selection of 27 multi-axis sliding and fixed-head CNC machines, producing batch sizes typically of 300-off and above. Customers come from a wide range of industry sectors, including pneumatics/hydraulic motion control, automotive, aerospace and electronics, with around 80 percent of Unicut Precision's business coming from OEMs.

Jason Nicholson, managing director of Unicut Precision, says: "Our philosophy is to work with our customers over the term of a contract to provide a value added/value engineering resource and provide cost-down benefits through our engineering experience. One example of this was a contract with a value of £4.8 million over four years, where we took eight percent out of the cost over the term. To achieve this, we have a two-way street with customers and their commitment to us with longer, 12, 24, 36 month contracts is repaid by our willingness to invest in machines and people."

Unicut typically invests £600,000 a year in new machine tools and it was with this willingness to invest that saw Unicut step out of its comfort zone and purchase a Mazak i600 Variaxis 5-axis machining centre,



equipped with a pallet change system to support a contract for a prestige automotive manufacturer. While the components for this long-term contract are relatively small, the £500,000 machine was specified to provide Unicut Precision with options for future, larger, components to be machined. However, specifying a larger capacity machine highlighted the issue of tool reach on the small parts. In order to maintain short tool lengths a series of riser blocks were required. These had to have the Zero Point locations on them to suit the existing WNT ZSG vices that were being used. After an initial discussion with WNT's technical sales engineer Duncan Slough, which involved a few sketches and an outline of what Unicut wanted to achieve, WNT developed working drawings. These were duly signed off by Unicut and the bespoke riser blocks were then machined at WNT's technical centre in Sheffield by Tony Gale, one of WNT (UK)'s project sales engineers. Less than three weeks later, the completed riser blocks were fitted to the machine's pallets.

The WNT ZSG 4 centric vices and the riser plates have given Unicut added versatility. The ZSG vices have jaws that are fully interchangeable and are designed to eliminate the requirement for a crimping tool, common on other vice systems. The

precision matched slides ensure repeatable clamping of +/- 0.01 mm and the integration of zero-point location ensures setups are quick and repeatable to the same level of accuracy. Component security is also maximised with a maximum gripping force of 35 kN. This means that components can be gripped on the minimum amount of material, 3 mm in the case of Unicut Precision, with around 200 mm of material projecting from the vice.



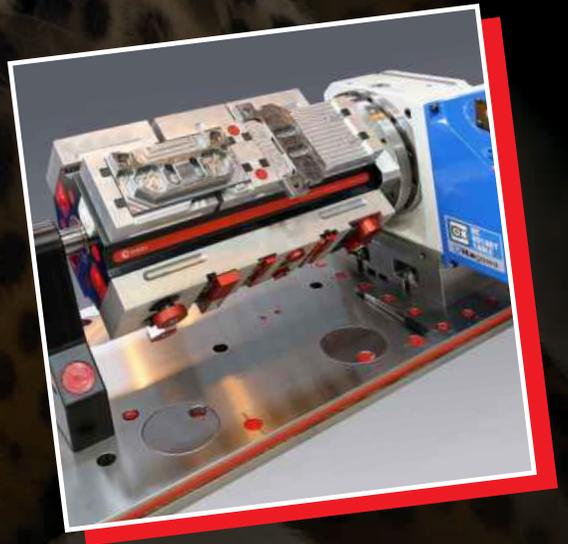
Jason Nicholson concludes: "The solution presented by WNT along with the service and support has ticked all the boxes for us. The result is a cost-competitive system that not only solved our immediate workholding problem with the part we were producing, but gives us options with other parts that we want to put on that machine. Having the riser plates with a vice mounted on the top with zero point allows us to lift the part off the table and keep cutter lengths to a minimum on smaller components. We now have a truly flexible workholding system."

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# Filtermist's extraction experts discuss dust

Dust particles generated in a wide range of manufacturing and production processes pose a significant hazard to health. They can cause respiratory diseases, skin irritation and eye problems, and, in some instances, can result in deadly explosions if left to accumulate in the atmosphere.

Effective control measures play a vital role in protecting people from the effects of inhaling contaminated air and should always be designed, installed and maintained by industry professionals.

Filtermist International has almost 50 years' experience in ensuring workshop air is clean and safe to breathe. Kevin Hood, sales director at Filtermist subsidiary Multi Fan Systems, and Jamie Allen, one of Filtermist's dedicated LEV (local exhaust ventilation) engineers, discuss the importance of working with professionals with specialist expertise.

### Extraction system specification

Kevin Hood says: "Regulations including CoSHH (Control of Substances Hazardous to Health) and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations 2002) require exposure to hazardous, potentially explosive substances to be prevented or minimised as much as possible."

"The best way to do this is by installing an LEV system to extract and filter contaminated air at source. This approach protects operatives by ensuring that the hazardous substance does not enter workplace air.

"From the outset, it is vital to establish exactly what substances need removing. If the substance is classified as explosive, such as flour, wood or aluminum dust, ATEX rated explosion relief panels should be incorporated into the design of the LEV system. This can have implications on the position of the filtration unit. Ideally the unit should be located outside so that in the event of an explosion occurring, the blast is outside away from works personnel, rather than inside, the factory.

"However, when this isn't possible effective suppression systems should be incorporated into the system design."

Explosion relief panels are also a consideration for Filtermist's LEV engineers during routine LEV Tests. Jamie Allen explains: "We carry out a comprehensive

risk assessment as part of all LEV Tests and if this shows that the system is being used to extract potentially explosive substances, we will check to make sure ATEX rated panels are in use.

"If they are missing, we will include a recommendation that they need installing immediately in the report submitted to the customer. We strongly advise that all of our recommendations are acted on, but in hazardous environments this is even more important as it can literally mean the difference between life and death."

Correct design of all dust control systems is key. Kevin Hood explains:

"We provide customised systems depending on specific client requirements and will select which dust filter is used depending on the characteristics of the dust that needs extracting.

"The standard A•dust range from Filtermist's sister company Absolent AB offers airflows of up to 13,500 m<sup>3</sup>/h depending on the type of particulate which is being filtered, and other filters are also available for larger airflows. These filters are ideal for a wide range of dry applications, but in certain situations a wet scrubber might be more appropriate.

"As well as vented explosion relief panels, certified ATEX equipment including anti-static filter bags, earth bonds, and non-sparking components can all be used to handle potentially explosive particulate. Explosion isolation valves and possibly fire dampers should also be incorporated into the ducting to prevent propagation of explosions or fire spreading in the event of an incident.

"We consider all aspects of the installation before recommending specific system components."

**Stand-alone or central extraction system?**  
Another important factor when it comes to



system design is whether a stand-alone filtration unit, or a centralised system drawing contaminated air from multiple pick-up points would be more effective.

Kevin Hood says: "Again, this depends on the specific circumstances surrounding the job. The type and volume of contaminant, the number of extraction points required, available space, and budget will all have an impact on the final recommendation.

"Up to date knowledge of all relevant legislation is also key. As well as a thorough working knowledge of regulations designed to control indoor air quality, if the extraction system is being vented outside, pollution prevention and control considerations must also be taken into account."

### Performance monitoring

Once the extraction system has been installed, it is then the responsibility of the employer to ensure it consistently performs as intended. CoSHH regulation 9.2 requires most LEV systems to be tested by a competent person at least once every 14 months.

Jamie Allen says: "The engineer will use a variety of equipment including a rotating vane anemometer or a hot wire

anemometer to measure velocity at the test point, and a pitot tube to test pressure. Readings will then be compared with data in the system's design specification and used as a benchmark to ensure performance is being maintained."

As well as employers' responsibilities under CoSHH regulations, employees are also required to play their part in safeguarding the workforce. Operatives are required to report 'forthwith' any defects in the LEV system which could impact on its ability to work as intended.

Jamie Allen continues: "There are a number of ways of checking that an LEV system is working correctly between routine LEV Tests. Daily checks should be carried out to look for any obvious signs of wear and tear, or indications that there may be contamination in the air.

"Pressure gauges and airflow indicators can be used to clearly identify pressure drops or other potential issues with the system. Using a dust lamp makes it easy to see airborne particulate, as well as checking that the fan is drawing the contaminated air into the filtration system.

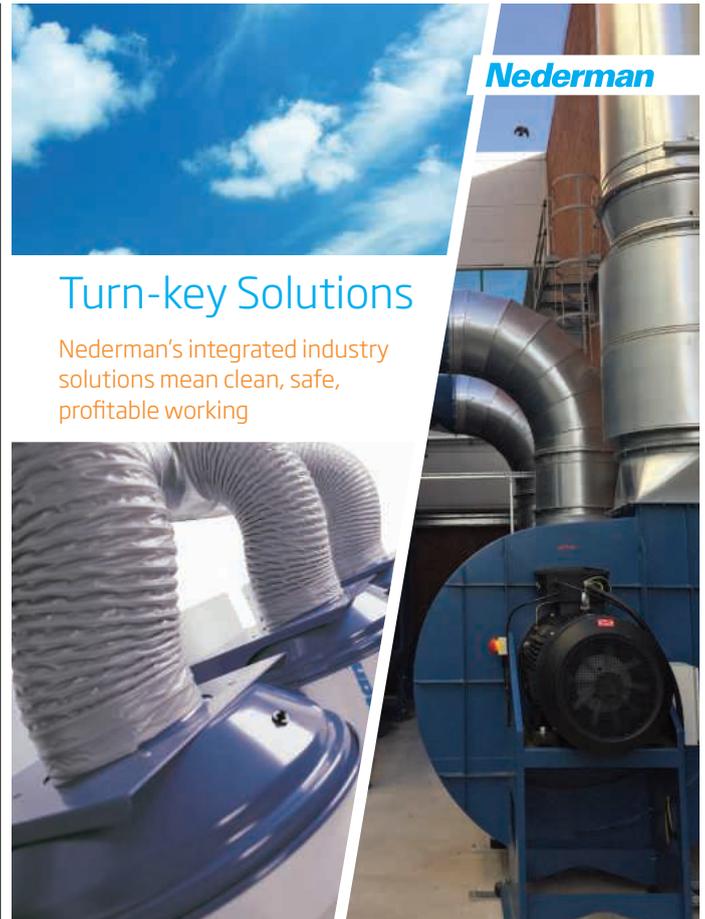


"Smoke sticks can also be used to check the direction of extraction. Observations and data should be recorded in a log-book which can be used as an auditable trail in the event of any issues with the LEV system."

### Air monitoring

Air monitoring is designed to ensure control measures are working as intended and employees are breathing air which is clean and safe. Jamie Allen concludes: "Static monitoring can be used to assess air quality in a specific area, whilst personal monitoring samples air in the operator's breathing zone. The results are then compiled into a report which can be used to help employers ensure they are compliant with current legislation and fulfilling their duty of care to employees."

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**Nederman**

# New range of articulated extraction arms for fume and dust extraction

Articulated extraction arms are the best and most cost-efficient solution for applications where extraction of small volumes of gases, dust and fume is required within a limited area. Nederman has now launched its new range of FX2 extraction arms that are small, manoeuvrable and easy to use, and therefore ideal for such applications.

The new Nederman FX2 range is designed to capture pollutants as close to their source as possible. A high capture rate is achieved with minimum energy use, and any hazardous airborne substances are removed before they reach an operator's breathing zone or contaminate premises and goods. The new Nederman FX2 is packed with benefits that include low noise levels and improved energy efficiency, stable positioning with easy manoeuvrability, an aesthetically pleasing user friendly design and complete freedom when planning installations. All these features combine to make the new Nederman FX2 range the most desirable solution for efficient 'at-source' extraction of small air flows.

The low noise level and improved energy efficiency of the FX2 arms was achieved using computerised simulations during the design phase. The result is a highly improved air flow with lower pressure loss, meaning smaller fans can be used which consume less energy. Complementary products such as Nederman fans, ducting and control units can increase the energy efficiency even further. This reduces the

noise level to an impressive level that is 5 dB less than alternate extraction arms on the market.

The new Nederman FX2 arms are highly flexible and easy to position, extend and retract. This stable positioning with easy manoeuvrability is achieved via the two outermost arm joints that can rotate 360°. This makes it possible to position the hood exactly where required. Once correctly positioned, the hood can be locked in place using two friction devices in the arm joints.

As with many products from the extensive Nederman portfolio, the new Nederman's FX2 arms are available with a choice of options. For the FX2 arms, Nederman has three different models that cater for a wide spectrum of needs. These three variants can cover applications in laboratories, the electronics industry, 3D printing, health service and pharmacies, gluing stations, museums and hair and nail salons and much more.

Regardless of which option you select, Nederman FX2 arms incorporate an aesthetically pleasing design that is lean and smooth, and it allows the arms to fit into any environment without compromising durability and reliability. The swivel design is optimised to ensure a slim profile and clear sight. With a long upper arm section, the FX2 PLUS swivel and accessories can be placed high up or above a false ceiling. This creates a modern design that is neat, good looking and practical, preventing dust accumulation. This flexibility gives the user complete freedom when planning the installation of dust extraction equipment. The Nederman FX2 can be mounted on ceilings, walls and floors or even fixed to worktops, giving the end user a safe, reliable, robust and compact solution.



Wall mounted benchtop arms from Nederman

This unprecedented level of adaptability and flexibility gives customers a unique opportunity to adapt the arm installation to meet their own facilities. With the option of Cut2fit aluminium profile extensions that can be cut at any length and assembled together with the classic bracket for mounting arms to the ceiling or wall, the Nederman FX2 arms are ideal for virtually all application areas.

Nederman is one of the world's leading companies supplying products and solutions in the environmental technology sector focusing on industrial air filtration. The company's products and solutions contribute to reducing the environmental impact, create safe and clean working environments and improve production efficiency. Nederman offers complete solutions, including engineering and design, commissioning, installation, training and aftermarket. Sales are managed through the Group's own sales offices and distributors in over 50 countries. Production is performed in 12 countries on five continents. The Group is listed on Nasdaq OMX, Stockholm and has around 1,900 employees.

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Plus arm with semi transparent false ceiling

## Coolant and oil mist extraction systems

Coolant mist, oil mist, and oil smoke from machining are hazardous and can be potentially carcinogenic. Multi-stage filtration is required to remove progressively finer mists and swarf; with heavy duty final filtration for oil mist and smoke applications. Final stage HEPA filtration ensures almost 100 percent removal of contaminants.

### Why is a mist extraction system important?

Coolant and oil mist inhalation from machine operations can put the operator's health at risk as well as anyone else in the vicinity. Metalworking fluids can be carcinogenic and this therefore makes it necessary to protect the workforce from these dangerous substances.

When machining parts, coolant forms a mist within the machine tool which should be captured and filtered before the machine door is opened to prevent operator exposure.

AirBench offers a range of mist filter units with capacities ranging from 500 to 4,000 m<sup>3</sup>/hr, allowing the capture of mist from even the largest machine tools.



The AirBench BD blowdown bench

After machining, parts are removed from the machine tool. Swarf and coolant must then be removed from the part prior to further processing. The AirBench BD blowdown bench is a cleaning cabinet for the containment and filtration of swarf and mist from machined parts. BD is designed as a complementary unit to be co-located with each machine tool.

Finally finished parts may require polishing and sanding; these are typical AirBench dust extraction applications. For coolant mist within machine tools, the company offers the OMF range. For mist and swarf removal from machined parts, the BD units are the answer. For sanding and finishing, the FN or FPK ranges, with 'A' type filters for aluminium parts or 'C' type filters for steel, are offered.



The OMF in operation for coolant mist extraction

**Airbench Ltd Tel: 01206 791191**

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## Thermal fluid heater forms part of exhaust air purification system

A Babcock Wanson TPC 200B Thermal Fluid Heater has been installed at Bridgnorth Aluminium Ltd as a key component in its exhaust air purification system.

Bridgnorth Aluminium Ltd is the UK's only manufacturer of lithographic aluminium strip with a purpose built, state of the art rolling mill and stretch levelling line in its Shropshire site. The company is focused on maintaining a clean alloy system with its high purity aluminium alloy product range, which requires considerable technical knowledge of the process requirements.

As part of a planned expansion, Bridgnorth Aluminium Ltd recently purchased a refurbished rolling mill from overseas. As with all rolling mills that use oil as a coolant and lubricant, amounts of oil are emitted in their exhaust. In line with best practice, Bridgnorth Aluminium Ltd has installed an Achenbach AIRPURE<sup>®</sup> exhaust air purification system to separate and recover hydrocarbons from the mill exhaust, in this case tetracene. Babcock Wanson's TPC 200B Thermal Fluid system forms an integral part of this process, heating the

exhaust air to enable the AIRPURE system to recover virtually all rolling oil. Babcock Wanson not only supplied the new TPC 200B thermal fluid system but was also involved in laying out the pipework and connections to the heat exchangers.

The TPC 200B is a fully automatic coil type, multi-pass thermal fluid heater complete with integrated burner, control system and safety devices. It provides optimal distribution of the heat, high fluid velocity in the exchange tubes and continuous flow monitoring to ensure long thermal fluid and system life and the highest level of safety.

While Bridgnorth Aluminium Ltd hasn't been using the system long enough to gather comprehensive energy efficiency data, it is expecting considerable energy savings. Babcock Wanson claims between 20-50 percent energy savings can be made by using a TPC B thermal fluid heating system, when compared to the transfer of the same amount of heat using traditional steam boilers. These savings are achieved as the thermal fluid does not need to change



state to transfer the heat, as would be the case with steam, which means no trap losses, no blowdown losses and no flash steam losses. This also makes for much simpler operation and very low maintenance needs. With lower energy input demand also come lower total exhaust emissions so thermal fluid systems are much kinder to the environment.

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# Precision measuring centre for seamless workpiece measurements

Systems supplier Klingelberg, a leading manufacturer of precision measuring centres for the gear industry, has unveiled the newest member of its P series, the P 16 G, a measuring centre that represents groundbreaking territory for the company. The measuring centre is for round components and was developed specifically for use on the production floor. The P 16 G is designed around measurement tasks outside of gears.

Whether turning blanks, ground workpieces, circular blades, spacers for circular blades, or ball bearings, the latest addition to the P series eliminates the use of gauges during production and quality assurance of axially symmetrical parts. In fact, the "G" in P 16 G stands for "gauge". With this latest innovation, Klingelberg has once again combined its experience in developing machine tools with its expertise in precision measuring technology.

Dr. Christof Gorgels says: "The P series has long been a fixture in the gear manufacturing industry. Close cooperation with our customers demonstrated the potential of applying the high mechanical accuracy of the Klingelberg machine design and our powerful software in other industries and sectors as well."

The goal is to replace component-specific gauges and multiple-position measuring devices, which are capital-intensive and inflexible. Klingelberg's approach therefore is to combine all typical measurement tasks for a broad range of round components on a single measuring machine, one that is designed for use directly in the production environment. This makes the P 16 G an economically appealing strategy for direct production monitoring.

### The software makes the difference

In striving to always stay close to the market and to meet customers' needs, Klingelberg brings to market with its P 16 G a precision measuring centre that is fine-tuned specifically for the production of round components in the small diameter range and optimised for use on the shop floor. Every bit of experience gleaned from the compact P 16 machine design was incorporated into the P 16 G. Instead of gear software, the P 16 G comes equipped with software for dimension, form, and position measurement. The software records diameter and cylindrical form/conicity, measures axial runout, evenness and angularity, thus delivering a wealth of information for quality management as required.

### Roughness measurement also on internal gears

The Klingelberg roughness measurement system, which has already been successfully used in several hundred P machines, has now been expanded to include internal gear measurements. The possibility of carrying out systematic measurement using a fully automatic, CNC-controlled measuring run is what differentiates the Klingelberg system from many other roughness measuring devices and this is why the system is highly valued by users. With the same benefits, the surface roughness of internal gears can now also be measured on the machines of the P series. Klingelberg will demonstrate this innovation on the P 40, using a typical internal gear from the automatic transmission of a passenger car.



### Proven solutions for gear measurement

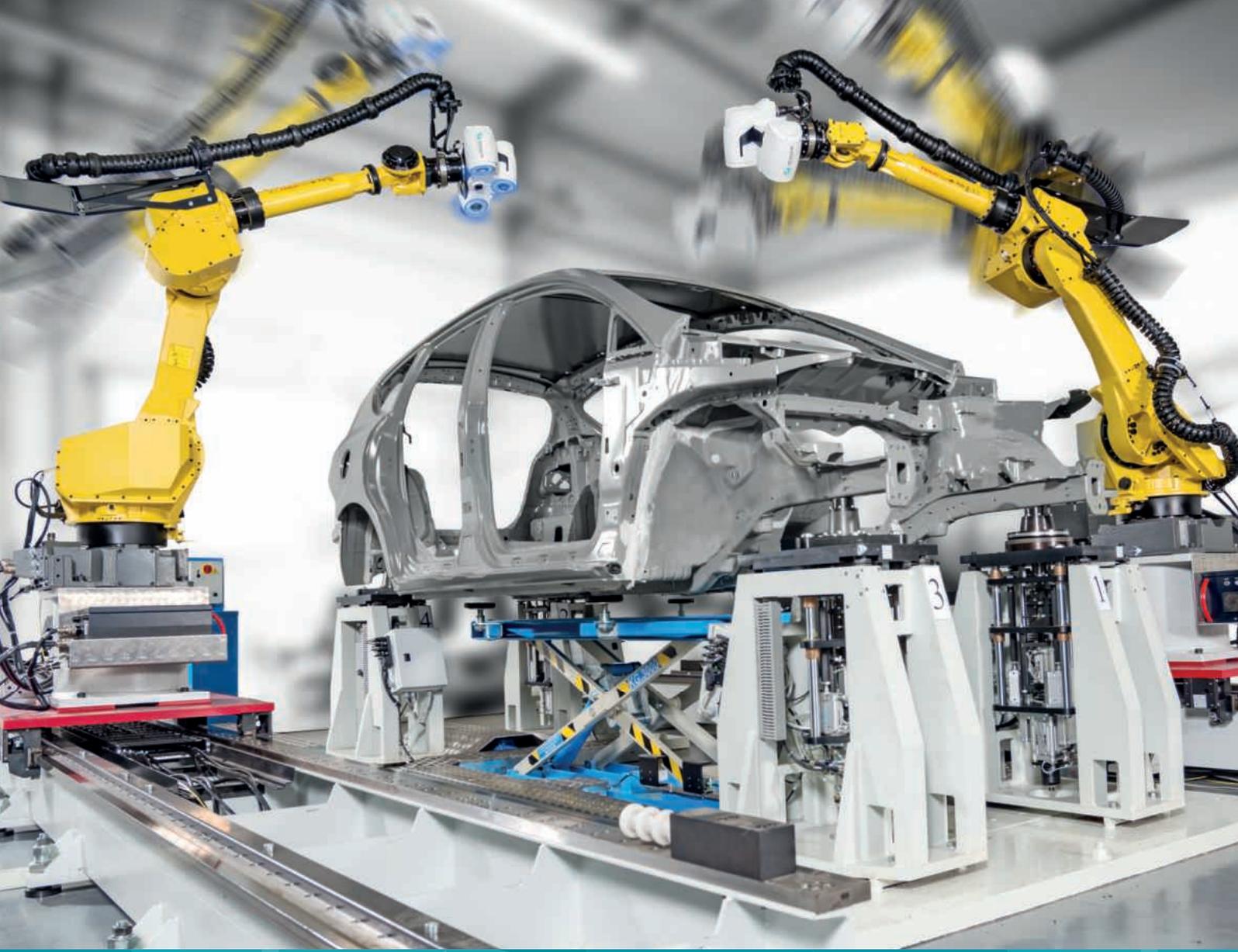
Optimal solutions for gear quality management processes that are guaranteed to ensure future success. The machine and software concept of the P series is optimised for measurement of complex drive components using a technology that replaces up to four conventional measuring

Founded in 1863, the family-owned Klingelberg company is one of the leading companies in the gear industry. Thanks to numerous innovations in the areas of calculation, production, and measuring technology, Klingelberg maintains its position in this sector. With its acquisition of Höfler Maschinenbau GmbH's core business in 2012, Klingelberg has added machines for machining cylindrical gears to its range of products, reinforcing its position as a complete system provider.

Headquartered in Zurich, the machine manufacturing firm now develops and manufactures at its sites in Zurich, Hückeswagen and Ettlingen, as well as Győr, Hungary. The company also maintains a presence with sales and service offices and numerous marketing agents all over the world.

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# Trimos Height Gauge improves quality control of CNC components

Bowers Group has supplied Sentinel Plastics Ltd with a Trimos V4 700 Height Gauge to maintain high levels of inspection accuracy for CNC machined plastic components. Based in Cradley Heath in the West Midlands, Sentinel Plastics Ltd is an engineering company specialising in CNC machining and fabrication of all types of industrial plastics. Manufactured to customer specification, Sentinel Plastics carries out CNC Machining including routing, milling, turning and bending producing varied components for diverse uses such as power control units within wind turbines.

The Trimos V4 manual height gauge has a measuring range of up to 700 mm. Ideal for use in the workshop, the Trimos V4 is a robust, accurate and reliable height gauge. The functions on the display unit are directly accessible and depicted with easy to understand symbols, making the device easy and quick to use even by operators with no previous training.

Software enables personnel to transfer data from the height gauge directly to inspection reports, ensuring accurate recording of all measurements at inspection stations throughout the business. First article inspection reports can be easily generated, and handwritten recorded measurements can be bypassed completely,

saving time and allowing operators to devote more time to the inspection process.

The Trimos V4 height gauge enables Sentinel Plastics to quickly and accurately measure complex machined components, meeting a variety of measurement needs and improving its in process inspection procedures. Bowers Group also supplied the company with an XT3 Hometric pistol grip bore gauge set for measuring their internal diameters, and two Sylvac Hi-Cal 450 digital motorised height gauges for use on the shop floor.

Mark Rose, quality manager for Sentinel Plastics, said: "Following a generous grant from Wolverhampton University, we were able to buy the height gauges and bore gauges, which have been a significant step up in measurement capability for the business. Our inspection stations are now fully equipped, allowing us to take accurate measurements on the shop floor. The hand held bore gauges mean that operatives can take them directly to the machine and measure in situ, ensuring accuracy and saving time.

"The convenience of measuring components on the shop floor rather than having to move from the workstations to the inspection room saves time and makes people's jobs easier. It also gives our operators confidence that the parts they manufacture are precise and accurate.

"The Trimos height gauge is user friendly, highly accurate and repeatable. Operator influence is removed, improving consistency. The automatic data transfer and reporting software is an invaluable tool for us; goodness knows how we managed before. Our previous methods were industry standard, but old fashioned. We've always had the confidence to supply precision products with improved machining facilities and high levels of accuracy, and now we have quality data to back it up. Our new measurement equipment has allowed us to speed up our work, and add more confidence to the accuracy of our components; assurances which we are proud to pass on to our customers."

With high quality standards at the forefront of the business, Sentinel Plastics Ltd has always had exceptionally high



standards regarding the accuracy and finish of manufactured components. The company has a tightly controlled production and quality data base in which each process of manufacture and inspection is updated constantly using strategically placed process recording stations around the shop floor.

Founded in 1989, Sentinel Plastics Ltd has developed significantly in recent years by manufacturing components for the renewables industry, with customers including world leading power generation company GE Power. The company also manufacture components for the oil & gas industry which requires assurances of tight tolerances.

Continued investment in several CNC machines has enabled Sentinel Plastics to take on more work manufacturing complex components, which require the highest levels of quality and finish. The company was, therefore, looking for ways to improve accountability and accuracy in its process recording, and improve its inspection equipment to meet tighter tolerances for increasingly complex parts.

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## Cell delivers real-time data on the shop floor

Hexagon Manufacturing Intelligence is offering demonstrations of its versatile, automated white light sensor system for measuring a vast array of objects from small parts to complete car bodies.

The cell's sensor takes large, field of view images of the component and extracts geometric feature and surface point cloud data. Designed for inline, nearline and offline applications, it provides the user with actionable, real-time information on the shop floor.

According to Hexagon, the cell is unaffected by working in harsh production line environments which can include fluctuating temperatures, vibrations and variable lighting.

The cell, supplied with folding doors for easy transport, can be configured in a variety of formats to suit customer requirements.

Jon Kimber, Hexagon Manufacturing Intelligence's robotics and automation product line specialist, explains: "We can use any number and size of turntables, robots, white light sensor heads and linear

tracks to fit the application whether it's whole cars or small, individual components."

While mainly used for automotive sheet metal applications, the cell was also being increasingly employed by customers in the forging, casting and aerospace sectors.

For more information on booking a customer trial, call Hexagon on 0870 446 2667 or visit [hexagonmi.com](http://hexagonmi.com).

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, its expertise in sensing, thinking and acting, the collection, analysis and active use of measurement data, gives customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service



Hexagon Manufacturing Intelligence's white light sensor cell

centres, production facilities and commercial operations across five continents, the company is shaping smart change in manufacturing to build a world where quality drives productivity.

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## Hollow-shaft encoders with inductive circumferential scanning

New hollow-shaft encoders have been introduced by HEIDENHAIN, extending the manufacturer's range of products that use inductive position measurement and at the same time expanding the application range of torque motors.

The ECI 4000 and EBI 4000 robust encoders have a hollow shaft dimension of 90 mm, no integral bearing and offer high accuracy and repeatability. They allow the replacement of toothed belt drives when coupling a feedback system to a torque motor, boosting drive dynamics and functionality as well as reliability, as there are fewer components involved.

Electric drives are popular due to their small environmental impact, quiet operation, low wear and minimal maintenance. In particular, direct drive via a torque motor is gaining in significance, as it needs no additional mechanical transmission elements in the drive train. Based on its power density and dynamics, it is often indispensable for achieving the required production throughput.

The ECI 4000 single-turn encoder has a resolution of 20 bits, while the EBI 4000

multi-turn version has a revolution counter option with a resolution of 16 bits and an external battery backup. With an overall height of just 20 mm, they consist of a scanning unit that attaches to the stator and a scale drum for the rotor. Highly accurate positional readings are taken by circumferential scanning and evaluating two incremental tracks of differing periodicity, a scanning principle that allows more open mounting tolerances.

Compensation of position errors when the centre of rotation of the drive shaft alters is achieved by all-round scanning, up to a maximum speed of 6,000 rpm. In the case of rotary encoders with a single scanning track, under identical conditions the uncertainty of measurement is much higher.

The inductive rotary encoders have a digital EnDat 2.2 interface for continuous, closed-loop monitoring and are suitable for safety-related applications up to SIL (safety integrity level) 3, provided that additional



measures in the subsequent electronics are employed.

Power supply range is 3.6 to 14 V and the encoders may be used at temperatures up to +115 °C. Stator vibration of 400 m/s<sup>2</sup> and rotor vibration of 600 m/s<sup>2</sup> to EN 60068-2-6 can be tolerated.

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# OPEN MIND hyperMILL 2017.2

hyperMILL delivers faster programming and more flexibility

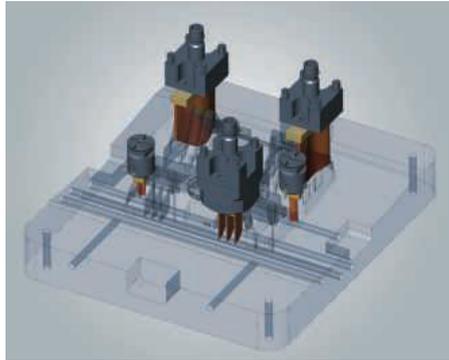
The new 2017.2 Version of the hyperMILL® CAM suite now provides a number of improved machining strategies, such as 3D-optimised roughing and programming aids such as T-slot feature detection. In addition, the CAD software hyperCAD®-S has been given a new module for the production of electrodes for die-sinking.

Highlights of hyperMILL 2017.2 include a new feature for the fast detection and programming of T-slots. With just a few clicks, T-slots can be produced extremely efficiently. This facility has two types of feature recognition: 'T-slots' and 'Pockets with bottom and T-slots'.

The 3D machining method 'rest material roughing' is a particularly prominent feature in the new version with a further optimised infeed strategy. The option 'Use infeed optimisation' calculates the optimal infeed value in connection with the additional chip thickness and depth values. This allows the user to adjust the machining parameters to the condition of the tool. The key advantage is that tools with long cutting lengths can be optimally utilised and precisely controlled by using the 'Maximum infeed' parameter.

### hyperCAD-S Electrode

As CAD software that has been specially developed for the needs of the CAM programmer, hyperCAD-S is available to hyperMILL users. The outstanding innovation in version 2017.2 is the hyperCAD-S Electrode module. This new module enables the fast construction of electrodes. An automated and comfortable process ensures the easy derivation of the electrodes from the face of the component geometry that should be eroded. This process is highly supported that



programmers can carry out with just a few clicks and without any special construction knowledge.

Once the programmer has selected the faces on the workpiece, hyperCAD-S creates corresponding collision-free electrodes with the necessary extension of the electrode faces and the derivation of raw material as well as the holder. The seamless transfer in hyperMILL is based on geometry and technological data. The CAM system supports the user with its own dialog window and feature type during the electrode programming. All of the important technology data is transferred directly from the hyperCAD-S electrode module into the feature information. This simplifies programming and avoids errors.

### More news in hyperCAD-S

Further innovations in hyperCAD-S are the user driven chain selection and the positioning of components with the help of relationships. For example, elements such as clamping jaws can be moved linearly or radially towards a central point between each other.

### hyperMILL SHOP Viewer: more transparency, fewer errors

The command 'Display statistics' has now been added to the hyperMILL SHOP Viewer. This visualisation solution for the workshop allows the users to view CAM and CAD data and to simulate data relevant to the production directly next to the machine. As a result, important information such as machining times or the number of tool changes can be seen by the users in the workshop.

### CAM strategies with technological perfection - from turning through to 5-axis simultaneous milling

2D, 3D, 5-axis milling and turning strategies, as well as specialty applications: Everything is available in one user-friendly interface. The fully integrated product concept with a CAD system, direct and standard interfaces, and postprocessors enables integrated processes from design to manufacture. With its innovative ideas, years of CAM experience and milling expertise, OPEN MIND develops both technologically sound CAM strategies and forward-looking solutions. OPEN MIND has made a name for itself internationally as a pioneer in innovative 5-axis technologies.



Today, OPEN MIND stands for a fully integrated product concept with solutions for automated programming, optimised processes and efficient manufacturing. New ideas are constantly being created for modern manufacturing thanks to this unique blend of computing and production expertise, experience and vision, international character and customised service.

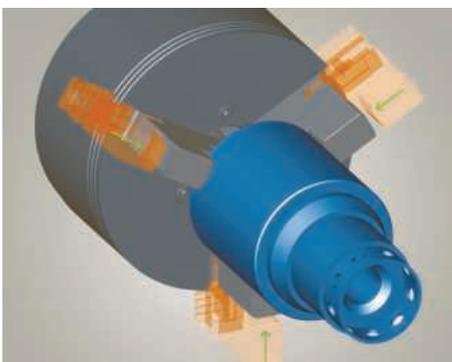
Manufacturers from a broad range of industries around the globe have decided to go with OPEN MIND products because they enable cost-effective and efficient manufacturing. This leads to models, prototypes, tools, moulds, prismatic workpieces, integral components and more, all in impressive quality

### OPEN MIND Technologies

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# Smoothing the ups and downs of surface machining

Freeform surface machining is widely used across many industries to produce sculptured surfaces, generally using multi-axis CNC machining centres. Industries like aerospace, automotive, mould & die, optics, and energy utilise advanced computer-aided manufacturing (CAM) systems to compute toolpath that flows across multiple surfaces.

Owing to this high level of machining complexity, the technology in a CAM system must utilise both surface shape and special algorithms to recognise unique surface characteristics such as curvature, normal vectors, and convex and concave regions. Depending upon the level of complexity, toolpath for surface finishing might be applied to the entire surface of the part or by sequentially selecting limiting contours.

To meet modern demands for productivity and surface quality, ESPRIT® CAM provides sophisticated machining strategies to calculate advanced surface toolpaths, simulate the process, and ultimately generate NC code to drive CNC machine tools via their control units.

## Traditional finishing strategies

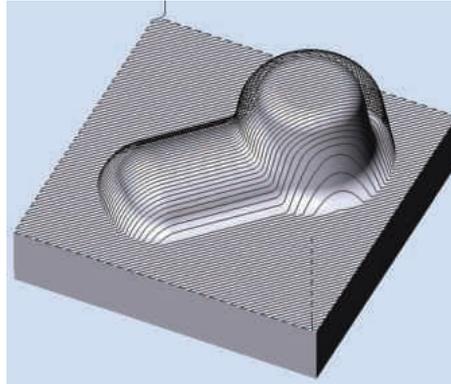
A few key machining strategies form the basis for most steep/shallow milling. Toolpath planning is critical to achieving a final part that meets engineering requirements in terms of geometrical shape and surface quality.

A machining process can either involve a single machining operation for the whole surface or a series of machining operations subdivided by the contours of the surfaces. However, a machining strategy that produces an excellent finish on shallow or flat areas of a model often produces poor results on steep or vertical areas. For this reason, most CAM systems offer a range of choices for finishing strategies.

Freeform surfaces are most often machined with three different toolpath generation methods. These methods traditionally include planar, Z-level, and offset.

In this process, toolpath generation is done by intersection of surfaces with evenly spaced planes in Cartesian space. This method of machining is like a 2D zig-zag

pocket toolpath, except that the toolpath is projected down along the tool axis onto a 3D part.



While this method is both simple and robust, a drawback becomes immediately apparent when the normal vector of a surface is close to that of the parallel intersecting planes. As the slope of a surface increases, the constant distance between passes can produce large scallops of material on near-vertical walls.

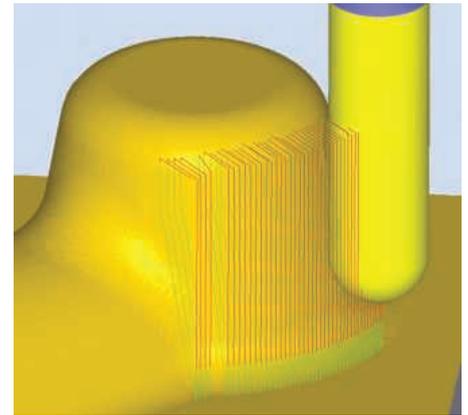
Parallel finishing works well on flat or shallow surfaces but causes a problem with scallops when the surface normal is close to that of the parallel intersecting planes. Decreasing the distance between the intersection planes can reduce the scallops on walls but leads to redundant machining of flatter zones. Therefore, applying a single planar strategy to an entire model almost always leads to either excessive machining time or a substandard finish quality.

To address this problem, CAM systems often offer an adaptive planar method that partitions surfaces into different regions according to their slope.

The Parallel Planes Finishing cycle in ESPRIT includes a strategy for the programmer to partition and exclude zones above a specified slope angle. These "lateral" walls are avoided in the initial machining, and then only those walls can be machined with planar toolpath that is kept perpendicular, rather than parallel.

ESPRIT's Parallel Planes Finishing can improve machining on walls by applying a perpendicular toolpath, rather than parallel, to steep zones.

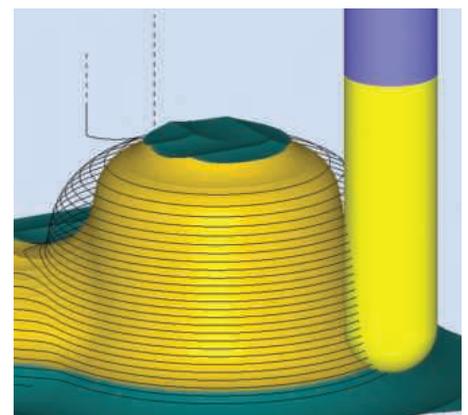
The Z-level toolpath is also planar, except



the model is sliced with evenly-spaced horizontal planes. In this process, a trace of the model is generated at each level. As with planar toolpath, when a near-horizontal surface has a normal vector that is close to that of the intersection plane, surface quality suffers.

The Z-level toolpath produces a good finish on steep regions, as the tool moves progressively downward along the tool axis. The Z-level toolpath works well on steep areas but skips areas where the surface normal is close to that of the intersection planes.

Another technique that works well on shallow or flat regions uses the shape that bounds the region to define the shape of the toolpath. The CAM system uses a slope threshold to identify and partition steep and shallow regions, and then toolpath is generated by offsetting the boundary of each region by a constant distance.



When a complex model has many areas of steep walls and shallow floors, applying a

single machining strategy to the entire model often leads to excessive machining time that only results in a substandard finish. Producing an acceptable finish on the model, then, involves the extra work of identifying the boundaries between steep/shallow zones and applying separate strategies that can lead to "waterline" marks along those boundaries as the tool must transition to machine each zone individually.

ESPRIT efficiently controls the machining of steep/shallow surface topology without the need for steep/shallow boundaries. This means that the CAM system can analyse surface angles of a model at runtime to identify and partition machining zones based on slope angle.

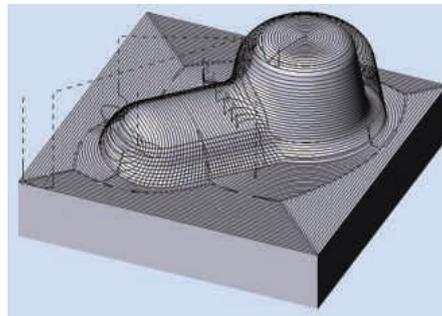
Multiple toolpaths take more time to plan, test, and machine, and can result in an inconsistent surface finish across the entire part. Some toolpaths may produce a better finish on certain areas than toolpaths in other areas, requiring the programmer to continuously adjust the machining parameters for each toolpath.

Depending on the machining criteria specified for the toolpath and the CAM system, some areas of the model might be machined multiple times when multiple

toolpaths overlap. CAM systems that have intelligent machining capabilities solve these problems with a sophisticated type of toolpath that intelligently applies the appropriate combination of Z-level and projection cutting passes based on the shape of the 3D model.

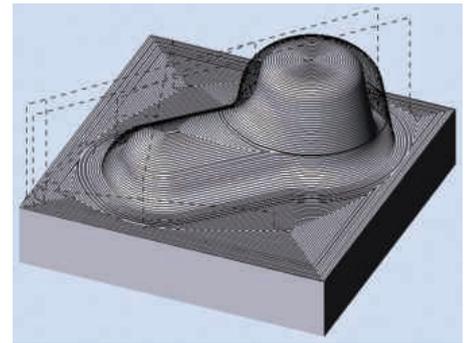
**Global Finishing as a comprehensive solution**

ESPRIT features a 3-axis Global Finishing method that combines the best of Z-level finishing and offset finishing in one comprehensive solution for steep/shallow milling.



Global Finishing optimises machining by not only calculating the most appropriate toolpath for steep and shallow zones, but

also by applying fluid transitions between zones to keep the cutter in continuous motion, thus eliminating visible marks between zones and improving machine utilisation. ESPRIT Global Finishing uses a single threshold angle to analyse the shape of complex surfaces to intelligently apply the most appropriate toolpath to machine an entire part.



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## Mastercam 2018 focuses on efficiency and speed

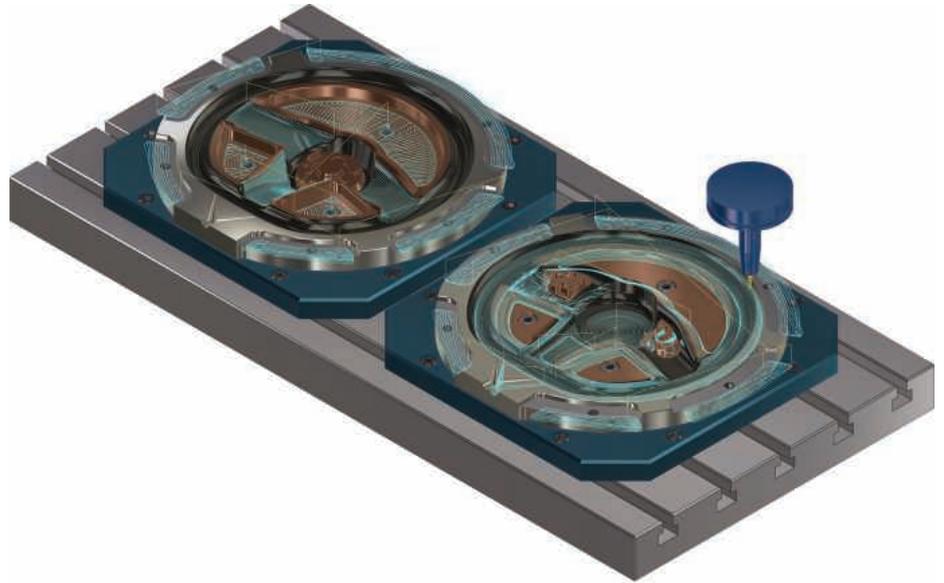
CNC Software has announced the release of Mastercam 2018. Mastercam 2018 brings a new suite of programming tools focused on delivering speed, automation, and efficiency for all machining jobs. Mastercam 2018 offers new 2D/3D milling features, design improvements, powerful turning and Mill-Turn enhancements, plus so much more.

### Milling advances

Stock awareness has been added to select 2D toolpaths and allows tool motion on the top, bottom, or both values of the stock. This provides a safer and more optimised tool motion. You can also optimise finish passes based on your rough stock, giving you more efficient and safer tool motion. The workflow for all 3D high speed toolpaths has been streamlined and gives you fine control over exactly where to cut. High speed Hybrid toolpaths now offer smoothing controls and deliver a finer finish, requiring less handwork. You can learn more about the dozens of additional enhancements to the Milling suite at [whatsnew.mastercam.com](http://whatsnew.mastercam.com).

### Expanded Turning and Mill-Turn

If you work with stringy materials such as aluminum or plastic, Mastercam's new Chip Break control prevents problems by allowing you to set length and time conditions, retract, and dwell options. Mill-Turn machine definitions now contain tailstock and quill components, tailored to your machine. Exclusive to Mastercam, a new set of turning strategies automate toolpath generation and support for Sandvik Coromant CoroTurn® Prime inserts and PrimeTurning™ method. PrimeTurning provides superior metal removal rate, productivity gains of over 50 percent and increased tool life in a variety of materials.



### New CAD tools for the shopfloor

Shops can model their own designs, but they also get in models that need to be corrected or prepped for machining. Mastercam's CAD functions are designed for the machinist. Angle Sweep improves the creation of more complex wireframe functions and when creating or editing primitives there are now on-screen sweep and rotate controls which can snap to the AutoCursor positions of existing entities. To make Roll and Unroll results easier to predict, Seam Control lets you visually rotate a seam to see how geometry will respond, as well as snap to AutoCursor positions. Hole Axis makes it easier to work with a large number of holes, especially holes with matching diameters that are selected as a group.

### Other options in the Mastercam 2018 release include:

My Mastercam gives you access to your

profile, Mastercam's social media outlets, your Reseller information, the Mastercam Forum and other helpful information. Streamlined workflow with improved plane management, level and geometry control, toolpath analysis and more.

Model Prep and Solid Model enhancements such as Multiple Undo/Redo for up to twenty-five functions and Solid Sweep have more options and controls than ever.

The Collision Control and the Multiaxis Link Safety Zone pages for Multiaxis toolpaths have been redesigned for Mastercam 2018.

Common direction has been added to the Tool Axis Control page for Multiaxis toolpaths and keeps the tool at a uniform tilt angle to reduce tool and machine motion. There are many other productivity improvements across the entire product.

For more information on Mastercam 2018, contact:

### UK Distributors:

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**[www.mastercam.co.uk](http://www.mastercam.co.uk)**

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# Mastercam 2018

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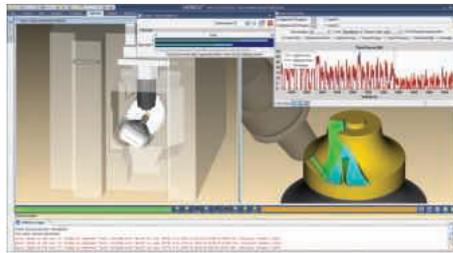
## PUBLIC BETA

## CGTech releases latest VERICUT software version 8.0.2

CGTech has released VERICUT Software Version 8.0.2, CNC machine simulation, verification and optimisation software. Numerous enhancements have been added to VERICUT's Force™ optimisation module.

Most notably, the updated Force "physics-based" toolpath optimisation module now receives input values directly from cloud-based tooling and benefits from many new features that streamline optimisation setup. By micro analysing the cutting conditions encountered by an NC Program, Force ensures NC programs have optimal feed rates, and ideal chip thicknesses that do not exceed safe force or power limits.

CGTech Ltd managing director, Tony Shrewsbury says: "With a specific focus on improving connectivity and closing the design to manufacturing loop, Version 8.0.2 makes even more use of tooling and cutting performance information available in CAM systems and cloud-based tooling, This direct input streamlines setup for more robust simulation, and enables users to 'see' and compare different cutting strategies to



ultimately choose optimal methods for their manufacturing environments."

Other new features include improved Charts display, which enables NC programmers and Mechanical Engineers to virtually "see" and evaluate force, chip thickness, volume removal rates, and more in NC programs before running on their CNC machine.

VERICUT 8.0.2 contains several other helpful enhancements to machine simulation graphic rendering, tool manager, and VERICUT Drill and Fastener (VDAF) simulation making VERICUT faster and easier.

CGTech has announced that the next Version of its CNC Simulation software,

VERICUT, will include a new Additive Manufacturing (AM) simulation module.

With the advent of hybrid machining centres that combine subtractive machining and metal additive deposition, CGTech has responded to user requests for VERICUT to simulate the entire CNC process of hybrid machines.

With more manufactures adopting AM into their daily operations, the timeliness of adding this new capability in VERICUT is critical. The new AM capability in VERICUT V8.1 simulates the same NC code that will drive the CNC machine, enabling companies to virtually experiment with combining additive and traditional "subtractive" metal removal processes to determine optimal safe "Hybrid" production methods.

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# Greenfield shows Radan power to tomorrow's engineers

Specialist CAD/CAM and logistics software from Radan is helping the largest sheet metal subcontractor in the South West of England to compete effectively with manufacturers in Eastern Europe and the Far East.

Based at Holsworthy, near the North Devon coast, Greenfield Engineering has the latest machine tools and state-of-the-art software to utilise them to the fullest capability. Currently operating out of two sites, combining 45,000 square feet, the company is in the process of taking an additional 6,000 square foot factory as part of its latest £1m investment programme.

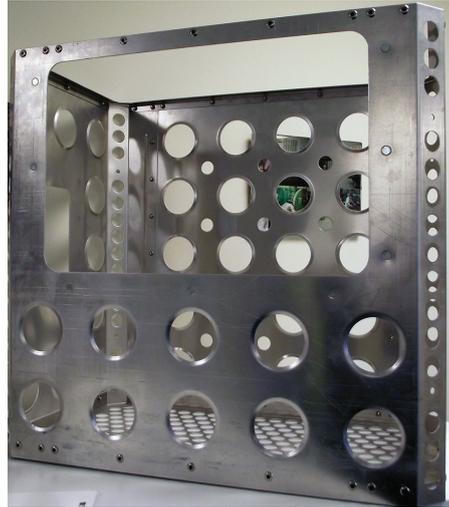
A recently installed Amada EM 3610ZRB punch press and buffet turret is fully automated with load/unload and part picking, enabling them to take advantage of opportunities of additional work from existing and new customers.



This brings its CNC machine tool tally to three punches as well as an Amada EML 3610NT 4 kw punch/laser combi. The punch/laser is equipped with a ten-pallet stockyard for part removal and component stacking, giving them true lights out 24-hour production capabilities, and means they have full manufacturing flexibility.

The EM3610NT punch also has a ten-pallet tower, capable of holding 27 tonnes of steel, and three-table part picker, along with an external tooling carousel holding ready-for-use 220-tool and 440-die options.

Market sectors include office furniture, electronic enclosures, point of sale, lighting, and vending, for a number of well-known names including Herman Miller Office Furniture and Bisley Filing Cabinets. Contracts range from producing basic individual components, right through to fully



assembled and packaged finished products. Four employees currently use Radan for 3D design and development, with two full-time programmers, and a third programmer on the night shift.

Greenfield operates an impressive apprenticeship scheme, which saw Gary Burnard rise through the ranks himself from apprentice to managing director. It currently has 16 apprentices, mainly working towards Level-3, with some at Level-2, and recruits more at each summer intake.

Gary Burnard says: "As manufacturing is not a major sector in Devon, it's hard to find people with the skills we need, so we train them ourselves to become the engineers of the future."

Apprentices are rotated through the entire business during their first two years, and are introduced to Radan while learning design and programming.

Gary Burnard says: "They pick it up so easily. It's very intuitive, easy to learn and easy to remember."

Greenfield are also pioneering the use of Radan's logistics suite in the UK. Gary Burnard says: "It allows us to take the raw demand from our ERP/MRP system and manage it in a number of ways. The Order Manager and Material Manager functions help us interpret what's needed to be done in the factory in a more efficient way."

The company first saw the

logistics package, all of which is currently not readily available in the UK, at the Euroblech exhibition.

Gary Burnard explains: "I hadn't seen anything like it before. Developed specifically for sheet metal equipment and recognising exactly what sheet metal manufacturing companies need."

The logistics suite was supplied by Radan's Dutch subsidiary Radan BV, and provides the ability to organise components and procedures purely from a planning and manufacturing aspect. Radan BV has been supplying Logistics products for many years. It is with that experience that Radan are currently in the process of utilising this expertise to provide a global solution.

Gary Burnard says: "We can take a number of components and put them together for a particular machining process, paint colour, or just a target date, rather than reasons of them simply being from single job. It increases our ability to plan and improve that particular function, meaning we're as agile, flexible and competitive as possible."

He says that project nesting complements the logistics suite perfectly, by allowing them to select parts from different jobs and different customers, and nest them together for best sheet utilisation.

The company has used Radan since the arrival of its first CNC machine.

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## Accuracy spot on thanks to Tebis

Up until recently, Interform Manufacturing had no CADCAM capabilities in place. By introducing Tebis to its shop floor, it is now achieving the accuracy it had been striving for and is eager to learn more about the company and how it could benefit other areas of the business.

Based in High Wycombe, Interform offers a complete range of vacuum forming and manufacturing solutions. Established 32 years ago, the company was originally set up to make lawn mower parts and have diversified to offer services to a variety of industries including aviation, automotive, marine, retail and TV & film. Its services include prototyping, tool making, fabrication and assembly and CNC machining. They've even made props for the Harry Potter, Star Wars and James Bond movies.

With 19 employees and an array of items to produce for a variety of industries, the time was right to invest and automate its CADCAM processes. It had previously been teaching by hand. There are now three employees working with Tebis on a Maka MK7 and KPF.



The company initially looked at four CADCAM systems with Tebis being the first, and ultimately the one that was chosen. Tim Spalton, managing director at Interform, explains that, from looking at them all, it seemed that Tebis was the most user-friendly and most suited to what it thought it wanted out of a system.

Tim Spalton says: "It's mainly the accuracy we've managed to achieve more easily. "We can now guarantee if we are machining a complicated part it is spot on. With what we are currently machining we could never have done it by teaching in hand."

One of the current projects Interform is working on is "Bo". Working with Bots and Us, components for the robot are being produced using Tebis software. Bo is described as the social robot with state of the art human-robot-interaction capabilities. Prototypes and parts for the Bobot are being machined with accuracy thanks to Tebis 5-axis trimming capabilities.

Interform is now considering its future plans with Tebis in mind. Tim Spalton concludes: "Now knowing what we can do with Tebis there are potential other uses we could use it for."

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# The digital transformation in globally-connected enterprises

## Lantek's Rob Powell talks about making Industry 4.0 work

Manufacturing is in a transition with the 4th industrial revolution. Digital technologies are at the heart of this change and are helping companies to connect their factories, customers and supply chains worldwide. While there are many benefits such as improved communications and process efficiencies, it won't happen overnight. Applying new innovations to a global team requires new or revamped processes that translate across cultures.



With the digital transformation, manufacturing industry is evolving rapidly as more and more companies understand the benefits of connecting their factories, customers and supply chains all over the world. With new technology and information changing quickly, manufacturers need to keep each other informed in real-time. There are now a number of innovations and technological advancements that are making it possible for industry to digitalise.

Overall, this is the moment when the conditions and environment for digitalisation are coming together for manufactures to make the transition:

- The technology is available now
- Prices for the innovations and tools are coming down
- Most governments are willing and prepared to help companies
- New managers understand digital transformation and are ready to implement the cultural change in their companies

Through these innovations, factories are entering into the digital world to become more efficient and productive. The connected view and the access to data are

bringing about new possibilities.

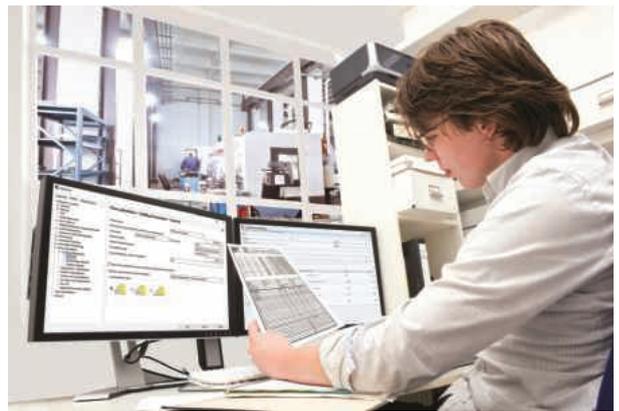
The benefit of having connected factories is that company leaders have a global view of all their plants. Managers can see the entire production line and where products are in their production schedules and they can see, for example, if certain machines are down or causing bottlenecks.

With this broader view, they can see which plant can produce items most efficiently and cost effectively. Or, if there are delays, they can see which machines may be causing it and what impact it will have on the overall schedule. With the digital transformation, the key to success in the manufacturing industry has shifted away from lowering direct costs to increasing efficiency and productivity and a closer relationship with customers and suppliers. Company leaders are charged with moving their workers towards these goals. They need to understand how incorporating new technologies and tools will allow them to serve their customers better.

For a change as large as the digital transformation, company leadership needs to be at the forefront to show the future direction of the company and the goals to be achieved. Employees need to understand why they need to change and how they will personally benefit.

While workers need to be open to the changes, managers need make sure they're communicating effectively and encouraging them. Part of implementing processes for better collaboration includes making sure everyone understands how they work and what the overall objectives and aims are. Company leaders have to empower and inspire workers and set milestones with rewards to keep employees on the right track, so they don't revert back to old methods.

One of the biggest obstacles in making the digital transformation is the



much-talked-about "skills gap." Companies need to know how to transition their employees to these new roles. Employee training is a crucial component. Current, experienced workers need training and education to learn the new technologies in order to give them the right mind set and skills to adapt to the changing environment.

It is also important to pay special attention to the mixing of current and newer workers in a company. While the current workers have experience, they may need the digital skills. The newer workers have the digital skills, but they lack the experience. By working together, these two groups can exchange the knowledge and technological skills needed to be well-rounded in both aspects.

Change in companies is always hard. Companies that make the transition to digitally-connected firms and factories will have advantages over those that wait. Those that master these new skills will take the lead in their markets and have an advantage over competitors. Companies that continue to wait may find themselves too far behind.

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# Weldall sees ROI of just six months with low cost nesting software

Weldall (Cannock) Ltd, based in Staffordshire, provides architectural fabrication services. The company decided to replace its ageing Haco punch press with a new Yawei Nisshinbo HPE punch press, the first of its kind in the UK. Its Haco was being driven by a CAM system which was cumbersome to use and had no automation features such as tool teach or nesting. Ryan Blower, operations director says; "Automatic tooling was basically non-existent. With the old system, you had to tell it exactly what to do."

Weldall briefly considered other CAM systems, but after initial investigation of a competing system, it quickly decided to take JETCAM, which was being offered by Press and Shear, the UK distributor for Yawei Nisshinbo.

It ordered the new machine and software, which was installed in November 2014. As JETCAM already had a postprocessor to drive the machine no development was required, with only minor tweaks needed during implementation to match the specific CNC hardware configuration. JETCAM Expert Lite was selected, which allowed it to get up and running at low cost, but with a clear upgrade path in the future to automatic nesting and integration into other systems such as MRP.

Installation and training on both the machine and software spanned a week, with the software itself only taking a day. Ryan Blower says: "We were up and running very quickly. After the training, if I ever needed something I'd contact support and they'd

produce a short video tutorial to show me what to do."

Once staff started using the system they quickly saw benefits. Complex tooling could be 'learnt' by the system and then automatically reapplied to new parts. Parts could be auto-tooled with a single click, whereas previously users would have to manually place each tool. As a result, programming time dropped by at least 50 percent.

Currently, Weldall utilises a nesting capability within the guillotine software, which generates an optimised nest pattern. Using JETCAM's bump nesting these can be quickly replicated using drag and drop, with automatic spacing against parts and the sheet edge ensuring that there are no overlaps of either parts or tooling.

One feature that was also beneficial in making instructions to the shop floor much clearer was the built in advanced reports designer. This allowed Weldall to design a comprehensive works order report detailing parts required, tooling, material and including images of parts and nests. The report could be further customised to match the company's corporate identity, giving a much more professional feel to the company.

In the two years since implementation the company has seen an increase in turnover/profitability in line with an ambitious business plan, which Ryan Blower cites is due to the increased capacity that the combination of the machine and software have delivered. With plans for a



second machine within 12-18 months Weldall also plans to upgrade JETCAM to include automatic nesting with the capability to go from CAD file through to optimised nests and NC code within seconds.

Ryan Blower concludes: "We saw an ROI on the machine within 12 months, but with JETCAM it was closer to six. We've also seen a few updates to the software, specifically with the new interface, that have been beneficial. Our plan is to continue with our long term-growth through continued investment in plant, machinery and technology."

The company was founded in Southampton in 2000 and 123 Insight Ltd's founders have a long and extensive experience in all aspects of providing 'traditional' MRP system solutions to the manufacturing sector. 123 Insight now covers MRP, ERP, CRM and Service & Repair, along with integration into various accounts packages.

The products and business model created are a response to the fundamental flaws, both for customer and supplier, inherent in the traditional supply of such systems.

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## TiFab project predicts huge material savings

The largest-ever research project backed by Innovate UK for developing cost-effective titanium alloy structural airframe parts is nearing completion.

The three-year TiFab programme has studied more than 170 aircraft components to assess their suitability for an advanced joining process which could offer annual raw material savings of around £9 m.

TiFab consortium members CAV Advanced Technologies, KUKA, Ten Solutions and The Welding Institute predict that manufacturers could save over 200 tonnes of titanium a year if they chose linear friction welding to bond parts instead of machining from solid billets.

The £2.6 m project has been designed to show how near net shape manufacture can boost productivity by using tailored blanks to produce lightweight titanium alloy parts. Its main aim is to develop an industrial scale demonstrator tooling system and components.

Linear friction welding was preferred to other welding or deposition techniques because of its speed and ability to achieve near parent material properties, explains

project leader Martin Wood: "Currently, forging and extrusions are the only tailored blank solutions suited to primary airframe structure components where material physical properties must be used to the maximum in order to minimise weight."

With the support of several OEMs, the project team has been able to examine a vast number of candidate parts, create design solutions for tailored blanks and establish weld process parameters.

"We've accomplished a 100 percent success rate in producing tailored blank solutions which also delivered at least 30 percent in material savings. It's a remarkable achievement especially as we didn't know what parts would be supplied by the OEMs," says Martin Wood.

As well as designing and developing a manufacturing cell and in-process quality monitoring system, the programme has also involved a fitness-for-purpose exercise and the identification of suitable demonstrator parts.

The final stages of the project are underway with the demonstrator testing programme almost complete. More



KUKA development engineer Kevin Moore at work on the TiFab project

information on the TiFab project is available online at [www.nearnetshape.co.uk](http://www.nearnetshape.co.uk)

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## Workflow system brings big benefits

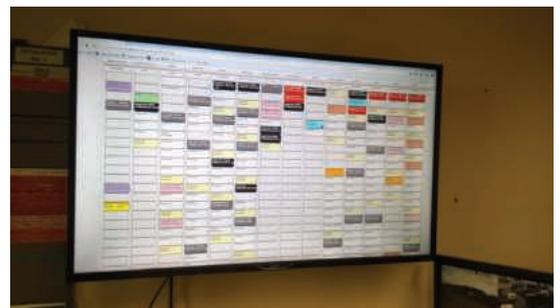
A great example of where T Cards Online is making a difference is at Northallerton-based LGSE (previously Londonderry Garage Ltd), a leading supplier of Hiab truck mounted cranes, Multilift demountable equipment and other associated services.

Managing workflow with simple, yet effective systems that provide the essential information at-a-glance is the main reason why manual 'display boards' like the T CARDS product have proven to be an excellent management tool. Now, in addition to the manual T Cards and T Boards; T Cards Direct also offers a web-based, online system which ticks all the right boxes for streamlining and communicating business processes. Since its original launch in 2011, T Cards Online has been continually developed and enhanced enabling users to manage workflow in real time using the drag-and-drop technique, moving job cards around the board to reflect current status.

**Customer satisfaction is key**  
LGSE serves both the public and private

sectors across the North of England, with a sales area which expands south down to Peterborough and Nottingham. It employs around 50 people and specialises in serving the commercial vehicle needs of operators working in the burgeoning waste recycling sector.

Like many motor industry operators LGSE appreciated the T Cards manual board system for many years, helping them to monitor and manage the status of orders and projects within their hire department and workshop facility. However, as LGSE's service and installation manager, Andrew Smith says: "We needed a system which matched our needs to enable multiple users at different locations on and off-site, to be able to view the status of orders and jobs in progress. Only a web-based, PC operated system would meet these requirements and we were confident that T Cards could provide a solution that matched our needs, hence our choice."



"We switched to the new system just over a year ago, initially using both the manual board and online systems. However, after only a few weeks we were happy to switch entirely across to the online system. We are delighted with the results, at the click of a button our staff at different locations can access all the information they need and this gives us better control and helps with individual accountability."

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# Hot news from Prima

## New 3D laser cutting machine dedicated to new door ring concept

Hot stamped parts are increasingly replacing traditional metal formed parts in automotive frame designs. As hot stamped components play a fundamental role in helping to reduce vehicles' weight, improving fuel consumption, cutting CO<sub>2</sub> emission and ensuring design strength, it is thought that the use of this automotive production method will substantially increase over the coming years.

A trend that is gaining momentum is the adoption of a new door ring concept, for example an element hot stamped as a single part rather than the usual four parts. This progressive technique minimises production costs, reduces vehicle weight and increases the performance of the component.

As a leading supplier to the global automotive sector, Prima Power has designed an advanced new product that is focused on this specific application, the Laser Next 2130. The new model maintains the performance of the popular 1530 model with an increased working volume, rendering it the ideal solution for the efficient cutting of large size hot stamped components.

"We could already offer the best and fastest solution for the cutting of standard sized hot stamped components," explains Marco Pivanti, 3D laser product manager at Prima Power, "but we needed an evolution of the Laser Next 1530 featuring an increased Y stroke to allow the processing of larger components, such as the door ring. Today we are proud to announce that a first class machine dedicated to this new and promising application has been added to our product range".



Laser Next 2130 has a generous working volume of 3,050 x 2,100 x 612 mm with a high-precision and dynamic 5 m turntable. Despite the Laser Next 2130's large capacity with its ingenious layout, the system is extremely compact and space efficient.

Laser Next boasts the best dynamic performance of the 3D laser machines currently available (208 m/min trajectory speed and 2.1 g acceleration), made possible by the application of highly innovative Prima Power solutions and the use of materials that provide class-leading kinematics and robust machine structure. The Laser Next 2130 can be equipped with 3 kW or 4 kW high brilliance fiber laser developed and manufactured by Prima Power. Direct motors and transducers are used for the machine's main axes and

focusing head, whilst the frame features an optimized shape made from synthetic granite.

"The Laser Next is typically used for mass production of automotive components, where efficiency is a decisive factor," continues Marco Pivanti. "The possibility to count on a single source supplier, ready to provide maintenance and assistance on all system components, is an important plus for our customers. With its new CF series generators, Prima Power is the only laser machine manufacturer to develop internally all essential elements of its products. This adds to the efficiency of Prima Power 3D laser systems, that are well-proven by hundreds of installations for 24/7 manufacturing of hot stamped components across the globe."

Laser Next features Prima Power's state-of-the-art focusing heads, direct drive motors for optimum performance, double protection SIPS and a fully metallic sensor for highest safety standards and Focal Position Control for flexibility. The compact machine is fully sealed in an enclosure for complete protection.



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# US banker becomes sheet metalworking subcontractor in the UK

Former investment banker Troy Barratt believes passionately in promoting manufacturing in the developed world, so much so that he gave up his career in Wall Street and then the City of London to buy a subcontract sheet metal fabricating business in Sittingbourne, Kent.

While working for a merchant bank in London, he learnt that rising labour costs in China and other low-wage countries, together with higher shipping costs and perceived quality issues, were opening up opportunities for manufacturers in the West.

So in 2012, together with his wife Catherine, he purchased 28-years-established sheet metalworking and fabrication company, Contracts Engineering Ltd (CEL) from the previous owners, who wanted to retire. By 2016, turnover had doubled to £2 million per annum, while the number of employees increased by only 50 percent to 30 people.

Part of the £600,000 the Barratts have invested during that time has been used to purchase a Bystronic BySprint Fiber laser cutting machine, capable of processing sheet up to 3 m x 1.5 m using a 2 kW fibre laser source. Bought in January 2017, it replaced a 3 kW CO<sub>2</sub> laser cutter of the same sheet size capacity dating back to 2002. The new machine joins two pre-existing 100-tonne Bystronic press brakes on the shop floor and a turret punch press acquired in 2013.

Troy Barratt comments: "When we took over CEL, the CO<sub>2</sub> laser machine's utilisation rate was under 50 percent over an 8-hour day shift plus nearly daily overtime.

"We quickly moved to a double shift, 16



Lukasz Bartocha at the control of the Bystronic BySprint Fiber 3015

hours a day, put a Bystronic service contract in place and were able to raise the time the machine was cutting to 60 percent. This is among the highest in the industry for subcontract manufacturers.

"Since the BySprint Fiber started operating in early February, utilisation has increased further due the machine's inherent reliability and new efficiency features.

"We ran it 24/5 for a while to remove a backlog of work and get in front of orders, which allowed us to minimise the cost of bought-in subcontract services during the transition period."

In this respect, it was helpful that it took Bystronic only two days to remove the CO<sub>2</sub> machine and 10 days to install and commission its fibre replacement, so the project was completed two days earlier than the fortnight that was originally quoted, which was spent training CEL's staff.

Troy Barratt had been closely watching the development of fibre laser cutting since he arrived in the UK and by 2016 was

convinced that the technology had matured. He part-exchanged his CO<sub>2</sub> model with 23,000 hours on the clock for the fibre machine, which had been operated for just 200 hours before the previous owner went into liquidation.

The deal struck with Bystronic UK for the 2 kW machine exactly fitted the needs of a subcontractor in the early stages of growth. Moreover, as the fibre laser source was at the low end of the power range, it has lower operating costs.

It is vastly more productive than the machine it replaced, transforming laser cutting in Sittingbourne from a perennial bottleneck into a work centre that has spare capacity to support the next phase in the company's growth.

The available power is more than capable of achieving three times higher output when processing material of 1 to 2 mm thick, be it stainless steel, COR-TEN weathering steel, mild steel including galv and zintec or aluminium. Thicker material gauges up to 5 mm are routinely cut by CEL at least as fast as on the CO<sub>2</sub> machine, while mild steel up to 10 mm thick is regularly processed on the BySprint Fiber.

Another attraction of fibre laser cutting is the significantly lower running costs compared with CO<sub>2</sub>. Troy Barratt points out, "We are saving £700 per month on gases alone, as we do not need to use nitrogen, helium and carbon dioxide as laser assist gases.

"We use nitrogen as the cutting gas on all work under 3 mm to achieve high edge quality, above which it is replaced with less expensive oxygen, as it produces results that are just as good, but we always use nitrogen when processing aluminium or stainless steel.

"Electricity consumption is 60 to 70 percent lower with fibre and replacement of expensive CO<sub>2</sub> optics is a thing of the past, leading to further savings.

"Moreover, as fibre technology is more reliable, we have bought a service contract for one engineer-day per 2,000 hours operation, rather than the three to four engineer-days we previously needed."



Managing director Troy Barrett with laser cutting machine operator, Lukasz Bartocha



One of the pair of Bystronic 100-tonne press brakes in use at CEL.

CEL's growth has been underpinned by winning new contracts from further across the UK than the former company owners were willing to seek, and by increasing the amount of fabrication. The vast majority of work carried out in its two dedicated facilities, totalling 12,500 sq ft, involves at least one other operation such as folding, MIG and TIG welding, forming, graining and

finishing, including powder coating, galvanising and plating.

Notable projects completed by CEL involve commercial developments and installations across multiple sites in London, Bristol, Cambridge, Manchester and many other European cities. The company is currently working on a project for the largest commercial development in Philadelphia, USA. Other customers are in various markets ranging from commercial street and office furniture, niche industrial sectors such as HVAC, oil & gas, machine manufacture and food processing, and interior and exterior fit-outs.

Troy Barratt has established two customer-orientated key performance indicators to expand his precision sheet metal and extrusion manufacturing business: 'on-time-in-full-delivery' and 'external quality spills' and pursues both with vigour. In his own words "Once the price is agreed, these are what matter most to our customers, so we focus on them relentlessly."

To help achieve these aims, he has used his project management and process implementation and improvement experience to put in place high-end

enterprise resource planning software and to harness the advantages of Industry 4.0 and Big Data to a level normally seen in much larger companies. It facilitates everything from costing and production planning to controlling operations and invoicing, and is ideal for managing diversity in a subcontracting environment.

This approach is reinforced by an in-house CAD/CAM estimating and engineering department run by an experienced welder/fabricator, a manufacturing + design offering led by a graduate mechanical engineer and a company-wide training programme to ensure that the very best is achieved by all staff. Everything is in place for CEL to become a significant force in sheet metal fabrication across the whole of the UK and especially in the south of England.

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Laser cutting on the BySprint Fiber 3015

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# A machine that grows to meet new challenges

The TRUMPF TruPunch 1000 is an entry-level punching machine that can gradually be expanded into a fully-fledged combination machine. Ultimately, it can become the TruMatic 1000 fiber, a laser machine equipped with a whole host of innovative features that punches holes, bends flanges and forms threads. Many TRUMPF customers want an economical, compact and automation friendly punching machine that is specifically designed to grow with their business. To address this need, TRUMPF introduced the TruPunch 1000 that can be expanded into an equally space-saving TruMatic 1000 fiber punch laser machine.

### Metamorphosis based on a 3 kW TruDisk solid-state laser

With its expandable functionality, the TruPunch 1000 provides the perfect entry point into the world of professional punching. It can handle sheets up to 6.4 mm thick at rates of up to 600 strokes a minute, yet is remarkably compact. With a footprint of just 6.5 x 4.9 m, the TruPunch 1000 stand-alone machine is around 15 percent smaller than its predecessor.

As their business evolves, sheet metal processors often have the requirement for the greater variety of parts that can be manufactured by a combination system. With the TruPunch 1000 there's no need to buy a second machine. Thanks to its novel modular design, the TruPunch 1000 can be



retrofitted with a laser cutting system, a laser evacuation unit and a beam guard system.

A 3 kW TruDisk solid-state laser can be connected up to convert the TruPunch 1000 punching machine into a punch laser machine. This configuration precisely matches the other recent addition to the product range of TRUMPF: the TruMatic 1000 fiber. This is the first time that TRUMPF has offered a combination machine at entry-level, a move that makes it easier for customers to make the switch from purely 2D laser processing to punch laser technology.

Customers who already have a TruDisk solid-state laser can also use this to operate the TruMatic 1000 fiber via the TRUMPF laser network. The competitive price of the new machine is a clear attraction and, with

the TruMatic 1000 fiber's specifications matching those of the previous TruMatic 3000 fiber model, customers don't need to compromise performance.

### Revolutionary punching head

Both the new models in the 1000 range offer completely redesigned drive technology, which is crucial to the success of the modular concept. The patented "Delta Drive" literally marks a new era in the world of industrial punching technology.

The advanced engineering team of TRUMPF came up with the new drive to facilitate the construction of smaller machines and open up new methods of material handling. The secret of the Delta Drive is that it eliminates the need to move the sheet and worktable in the Y-axis, normally an integral requirement of sheet metal processing. It achieves this by making the punching head quickly manoeuvre in that direction, a revolution in punching head technology.

This new approach involves a drive system that is powered by two servomotors. When the servomotors move in the same direction, they allow the punching head to move back and forth in the Y-axis. And when the ball screws rotate in opposite directions, this activates the punching stroke.

The y-axis can be accelerated far faster in this arrangement, because the punch drive is also used for travel motion, eliminating the need to move the sheet or worktable. As a result, the punching process is more dynamic and the machine is more productive. Furthermore, the lower relative movement between the machine table and the metal sheet reduces the risk of jamming and collisions, making the process more



reliable overall. Finally, the stationary machine table significantly reduces the size of the machine's footprint.

## Automatic sorting

Both the TruPunch 1000 and the TruMatic 1000 fiber can automatically sort finished parts measuring up to 180 mm x 180 mm. All processed parts are sent down a chute into a sorting unit which moves in a linear direction. From there they can be sorted into a series of boxes, up to four different 400 mm x 300 mm boxes. The boxes are positioned below the machine, which makes for easy removal by the operator.

Due to the innovative movement of the punching head, the machine also offers an alternative way to remove the parts. This second method comprises an additional big flexible parts flap, which is available as an optional extra for the TruPunch 1000 and fitted as standard in the TruMatic 1000 fiber. The flap can be equipped with a sensor that detects whether all the parts have been properly ejected from the machine's working area.

Designed with relatively generous proportions, this parts flap can also be used to eject long and wide parts into containers



or onto conveyors or pallets during both punching and laser operations.

Speaking at the Trumpf Open House last month, Annette Doyle, managing director, said: "We have had new product launches

and first product installations in Great Britain. First of all, the first TruMatic 1000 was installed in Bedfordshire, at Islebest. A first Panel Bender, TruBend Center 5030 was installed in Shropshire and a TruPrint 1000 has been installed at LPW in Cheshire. The first 16 kW TruDisk Laser is now running at the AMRC and this is the highest power Disk laser in the UK. In two months' time, we are implementing the high-speed eco cutting process, a development that complements our established high speed cutting process; both showing vastly improved cutting speeds on existing machines. Our customers also got a first glimpse at the TruLaser Centre, the fully automated laser cutting centre, at Euroblech and in the showroom in Ditzingen."

Annette Doyle concludes: Customer service has been the top management focus for the last 16 months and long-term results are evident to the customers."

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# TLM Laser enters into partnership with IPG

Bromsgrove-based TLM Laser has further enhanced its laser products and systems portfolio through a recent partnership agreement with IPG Photonics, the world leading developer and manufacturer of high-performance fibre lasers. TLM Laser will be responsible for the sales, marketing, installation and servicing of IPG's comprehensive range of laser cutting and welding systems throughout the UK and Ireland.

As a firmly established and highly respected supplier of laser technology, TLM already has the technical and application expertise required to seamlessly integrate this new product range into their product offering.

The IPG laser cutting and welding systems complement the existing range of laser marking, welding, engraving, cladding and hardening systems available currently from TLM Laser. The synergy extends beyond the application level, as systems already sold by TLM within the UK and Ireland, from FOBA Laser and Alpha Laser, actually use laser sources from IPG Photonics.

Just one of the new ranges of systems which TLM will now be promoting is the LaserCube, a compact fibre laser cutting platform that delivers superior cutting performance combined with low operating costs. Other products which will now be available from TLM include IPG's range of multi-axis laser welding systems.

TLM Laser director Andy Toms comments:

"We are delighted to be representing IPG Photonics, as this additional and complementary range of laser cutting and welding systems will open up new opportunities for us within a number of sectors including Medical, Automotive and Aerospace."

IPG Photonics Sales Manager Steve Ingram comments: "TLM Laser are the ideal partner for us within the UK and Ireland. They are highly respected for their technical expertise, market knowledge and pro-active approach to customer support and service. We look forward to working with them in developing this partnership."

IPG was founded in 1991 in Russia by physicist Valentin P. Gapontsev, Ph.D., a pioneer in the field of fibre lasers and recipient of various awards. In the beginning, IPG made and sold customised glass and crystal lasers, wireless temperature meters for hyperthermy and laser components. In 1992, the company began focusing on the development of high-power fibre lasers and amplifiers.

The firm received its first major contract from telecommunications carrier Italtel. IPG then won a second major contract from DaimlerBenz Aerospace. The company opened a facility in Germany in 1994 and established World Headquarters in the USA in 1998.

In 2000, IPG invested in new high-capacity production facilities in USA to manufacture its own diode pumps, a major component of



its fibre lasers and amplifiers. IPG is highly vertically integrated, producing all critical components for its lasers and amplifiers.

The company went public in 2006 and is listed on the NASDAQ Global Select Market under the ticker.

Founded in January 2006, TLM-Laser Ltd is a dedicated laser service company, providing a second to none service and maintenance program which we can implement to best suit its growing customer demands.

Located regionally throughout the UK TLM provides a quick and efficient service, whether it be a preventative maintenance contract or emergency breakdown cover. Its highly trained and experienced engineers have vast experience on a complete range of lasers. Whether it be lamp pumped lasers, diode pumped or CO<sub>2</sub>, it will endeavour to maintain and extend its growing reputation at the forefront of the laser servicing and repair industry by carrying out scheduled maintenance visits as well as providing call out cover.

Initially providing a 'Total Laser Maintenance' service, the company now offers a complete range of laser products from some of the leading names in laser technology. Alltec, Foba, Innolas, Univet, Bofa, ALPHA LASER, Coherent Laser Machining and Swisstec Micromachining are names immediately recognised globally within the laser industry for the highest of quality and outstanding customer service. These are all supported by experienced and highly trained engineers to ensure your equipment generates the maximum in productivity.

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IPG's LaserCube: a highly efficient laser cutting system with a compact footprint and low operating costs



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# 30 percent growth in 12 months for laser cutting

Precision laser cutting specialist FC Laser has installed a new 10 kW Bystronic fibre optic laser centre, which is capable of cutting materials as thick as 30 mm with incredible accuracy. Two more identical machines are to be ordered over the coming months.

At the same time, the company, which celebrated its fifth birthday in early June, has taken on undergraduate Swarrendep Samra on a 12-month internship. His main responsibility will be to get the absolute best productivity levels out of the Swiss-made machine and the others that will follow. He will also look at overall process improvements across the company and at problem-solving in many different areas. With an in-house specialist capable of maximising what the fibre optic lasers can achieve, FC Laser can move even further ahead of its nearest competitor.

The new 10 kW laser is 40 percent more energy efficient than its predecessor, so FC Laser will be able to boost its productivity while reducing its energy costs. Also, the machine is as easy to operate as using a mobile phone. With just a few swipes across a touch screen, the operator can sort job lists, assign cutting parameters, define the automation mode and start the cutting process.

FC Laser's general manager Steve Connolly says: "Speed, accuracy, quality and maximum uptime - the new Bystronic machine is literally at the cutting edge of laser technology and it is so easy to use."



FC Laser increases capacity with new 10 kW Bystronic fibre optic laser centre

He adds: "When the other two machines are installed we will be in our best position yet to meet the requirements and demands of our expanding customer base."

FC Laser recently announced a record year, with 30 percent growth in 12 months, with a move planned for 2018 to a new 20,000 sq ft factory. The company was also recently accredited to the ISO 9001: 2015 quality management system.

The phenomenal success of precision

laser cutting specialist FC Laser is based on a combination of the highest levels of quality control (the company is accredited to the latest ISO 9001 and EN1090 standards) and the fastest turnaround times in the industry, from initial quotation to final delivery. Respected throughout the highly competitive metalworking sector for its 100 percent commitment to deliver on promises it makes to customers, FC Laser uses the very latest cutting technology, including a suite of Bystronic laser centres to deliver a level of service not often associated with laser cutting - whether working from a customer's CAD files or hand-produced drawings. This has helped the company to produce one-offs or 1,000-offs for satisfied customers in a range of industry sectors, including architectural and structural, agricultural, shop fitting and automotive.

As well as laser cutting, FC Laser offers CNC folding capable of achieving some of the most complex bends in the industry and such general machining services as pemming, tapping and drilling/countersinking.

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## Fast and precise 3D metal cutting laser machine

The Messer MultiTherm® modern cutting machine combines the three processes laser cutting, plasma cutting and ink-jet marking within one nested plan. Thus, for example, internal contours can be precisely cut with the fibre laser and external contours cut fast and economically with the plasma torch. Markings, charge numbers etc. are added with the Inkjet with no damage to the material. This simplifies cataloguing the individual parts and produces advantages for traceability:

The MetalMaster 2.0 offers the highest quality and the most modern technology in the smallest space. This cutting machine can be integrated into even the tightest spaces, requiring an area of only 30 m<sup>2</sup>. With its excellent value for money it enables even small companies to join the world of automated cutting. With its combination of plasma and oxyfuel cutting, it is suitable for a wide range of material types and thicknesses. So the MetalMaster 2.0 is not only very space saving but also operates particularly economically.

Short production cycles, the highest quality standards and increasing cost pressures demand continuous readiness to innovate, as well as the ability to keep up with demands in the future. A wish of many users is to be able to call up the machine status from any given location at any time, regardless of whether from PC, tablet or Smartphone. In this way machine downtimes can be recognised immediately and corrected faster, also evaluation of the actual cutting times gives planning reliability and yields data about the general productivity of the processes. Messer Cutting Systems gives its customers the appropriate interface for this and shows in a Live-Demo how the machine data is captured with the "Global Reporter" software on its own brand control Global Control and can be displayed on a Smart Device. As customer satisfaction can no longer be achieved

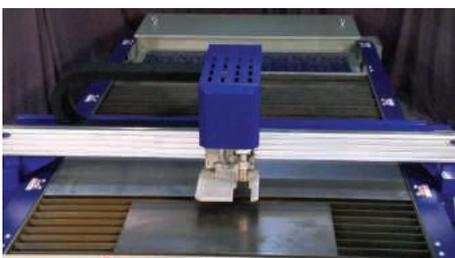
simply by making machine technology available, Messer has for some time been crafting an extensive service concept. Messer service experts can advise interested customers regarding their individual requirements. With various combinations of the MCS service modules right up to the complete "360° All-in" worry free package, the optimum solution can be supplied for every individual requirement. Interested customers can get an on the spot live demonstration of the virtual service software "Remote Service 2.0".



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# Laser processing on a sliding head

Citizen introduces laser cutting breakthrough to UK as part of CNC sliding head cycle

Citizen Machinery has fully integrated laser processing into the turn-milling cycle of a CNC sliding head lathe, enabling near endless possibilities for the creation of geometric shapes or precision holes in the walls of solid bar material that has been pre-drilled within the production cycle or directly into tubular bar material.

The development opens the metal cutting production process to producing burr-free holes as small as 0.2 mm diameter, with features such as spiral cuts with 0.025 mm kerf width and maintaining consistent and accurate radii less than 0.1 mm in corners of slots without any risk of tool wear or breakage. These can also be produced at a far faster rate than can be achieved by a separate EDM process, for instance.

The Citizen Cincom breakthrough opens new design concepts, in particular in sectors such as medical, electronic and micro industries where the speedy, accurate, highly flexible and reliable Citizen CNC sliding head machine can be integrated with the gains and advantages of non-contact laser operations. Laser cutting can offer quick and accurate 'swarfless' cutting, the minimisation of any chance of material deflection due to cutting force reaction and the highly precise production of special shapes and forms.

In a recent trial, a 150 W continuous laser head with an air purge to seal and clear the lens was mounted in the gang tool slide of the latest Citizen Cincom L20-VIII machine in order to be incorporated into the cutting cycle to produce a complete workpiece from tubular material in a single cycle.

The laser system has a separate control and amplifier unit connected to the

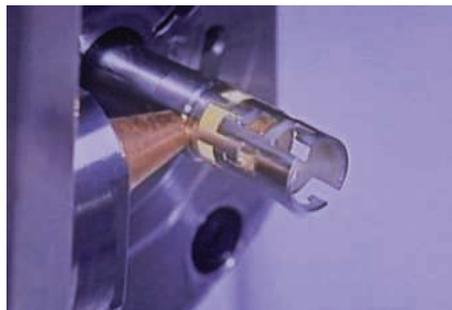


Profiled demonstration part form Citizen L20-VIII showing mesh-creation



A laser cut demonstration part produced as part of integrated single operation turned and milling cycle on a Citizen L20-VIII showing sliding interweaved portion on right of component

machine's Cincom control which applies M-code 'on-cut' and 'stop-cut' instructions. While solid bar material can be pre-drilled in the machining cycle and the laser used to drill, profile or engrave the component, with the program having precise control over the focal length of the beam in order to maintain the depth of cut, the tubular bar material from which the workpiece was machined in



Laser profiling in-cycle with turn-milling operations on a Citizen L20-VIII

the trial, was fed through an adapted bar feed unit. This allowed standard soluble oil coolant to be pumped at 70 bar pressure through the bore of the material. In this application, the flow of pressurised coolant ensured a cool cutting condition, washed away any melted material and localised the laser beam to the 1 mm wall thickness of the component as it was fed at a cutting feed rate of 1,800 mm/min.

The workpiece, produced from 18 mm diameter tube with a 16 mm bore, was turned, faced and a single flat milled on the outside diameter. The laser beam then proceeded along and around the periphery using C-axis rotation to create a series of

rectangular shaped features that were interlocked allowing the component to extend and retract.



Integrated laser nozzle on a Citizen L20-VIII sliding head turn-mill centre

A series of cuts were made to form a mesh and the Citizen logo profiled around the circumference. As a result, once the component was finished and parted-off, it enabled one end to slide axially over a short distance while still being interconnected to the main body.

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## Investment leads to rapid service

Reduced lead times and improved quality are the two-big benefits Oldbury firm Accurate Laser Cutting is now offering customers as a result of an investment in new machinery.

The sheet metal subcontractor has significantly boosted its processing capabilities by replacing two 6 kW CO<sub>2</sub> lasers with a Bystronic 6 kW 4 m x 2 m fibre cutting system in 2015, and another 10 kW model late last year, which is the most powerful of its kind in the UK.

Steve Morgan, company director, says: "For us, ongoing investment is key to our success and we are proud to now bring the full benefits of fibre technology to our customers. Not only does the equipment run significantly faster than our old CO<sub>2</sub> lasers, it also offers a vast improvement in cut quality across the entire thickness range."

The equipment can process thicker non-ferrous materials such as copper & brass to a superior standard, aluminium & stainless steel up to 30 mm thick and mild steel up to 25 mm.

The Bystronic fibre lasers operate in conjunction with a state-of-the-art pressbrake facility and in-house CAD department, offering a maximum pressbrake capacity of up to 4 m and 320 tonnes.

With an additional cutting capacity of 3 m x 1.5 m, phenomenal processing speeds of up to 60 m per minute can be achieved with the new 10 kW machine.

Jon Till, company director, adds: "In the bigger picture, the faster processing speeds on offer release more capacity for us to deliver consistently short lead times and improved levels of service all round."

Accurate Laser Cutting has built a solid reputation for its rapid turnaround times and high levels of service since its establishment in 2005. It aims to return customer quotations within four hours and are able to turn around orders in as little as 24 hours.

Using the very latest equipment, technologies and bespoke CAD/CAM software, Accurate Laser Cutting is capable of engineering, cutting, folding & bending a wide range of materials to any specification,



offering its customers unparalleled levels of accuracy, precision and speed.

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# ESAB to demonstrate state-of-the-art welding and cutting technologies

ESAB Welding & Cutting will provide live and static demonstrations of its innovative equipment for manual and automated welding and cutting on Stand 10F04 in Hall 10 at Schweissen & Schneiden, which takes place in Düsseldorf, Germany from 25-29 September 2017. ESAB's substantial presence at this event will include allowing visitors to personally use manual welding and cutting products, as well as personal protective equipment. Technical experts will provide demonstrations of automated and Industry 4.0 solutions, as well as answer visitor questions. Numerous systems will make their European and worldwide debut.

### Welding, Cutting and PPE breakthrough products

Since their introduction last year, Rebel™ multi-process welding systems have established themselves as the industry's most innovative machines in their category. Rebel's sMIG (smart MIG) function enables users to start welding, with an extremely stable arc and minimal spatter, just by setting material thickness and wire diameter. Stand visitors need to experience sMIG first hand to appreciate how well this technology works. sMIG enables novice welders to obtain good results with less practice, and it enables experienced welders to reduce set-up time and complete jobs faster.

For those who need to MMA and TIG weld in portable and field applications, ESAB will offer hands-on demonstrations of Renegade™ inverters, which offer extreme power in a compact format. They weigh 15 kg, measure 320 x 200 x 460 mm and produce a top output of 300 amps at 40 percent duty cycle. As a next-generation inverter, Renegade provides state-of-the-art weld control for a more stable arc, less spatter, improved arc starts and stops and the ability to optimise MMA performance for cellulosic and low-hydrogen electrodes.

For extreme cutting power in field and shop applications, the ESAB Cutmaster 60i manual plasma cutter weighs 16.8 kg and provides a rated output of 7.6 kW at 50 percent duty cycle at 60 A. It produces a recommended cut of 16mm, has a maximum sever thickness of 38 mm and provides the

fastest cut speed of any thickness material for its class. Unique features include an over-sized, high-visibility LED display, gas optimiser technology that helps ensure premium cut quality and performance by precisely regulating air pressure and a best-in-class ability to hold a longer arc, which especially helps when cutting in awkward positions and when gouging. The Cutmaster 60i system includes the new SL60QD™ 1Torch®, which offers a quick disconnect feature enabling selective replacement of either the torch handle assembly or torch leads at a lower cost than replacing both together.

Following the introduction earlier this year of the Sentinel™ A50 welding helmet, ESAB will introduce the Sentinel A50 Air, which includes a PAPR (Powered Air Purifying Respirator) unit. Sentinel has been one of, if not the most, in-demand welding helmets on the market due to its striking visual design, innovative colour touch screen control panel and Halo™ adjustable 5-point headgear. The ergonomic, low-profile design delivers improved weight distribution with five contact points, including a central pivot point that allows maximum head clearance while the helmet is in the up position.

### Data and productivity

Demonstrating its commitment to Industry 4.0 and the need to help customers automate activities that surround the welding processes, ESAB will demonstrate its award-winning WeldCloud™ online data management system in semi-automatic and robotic welding applications. Using a tablet or a touchscreen display, ESAB experts will show how WeldCloud's powerful applications and analytical tools enable real-time reporting and greater insight into welding data.

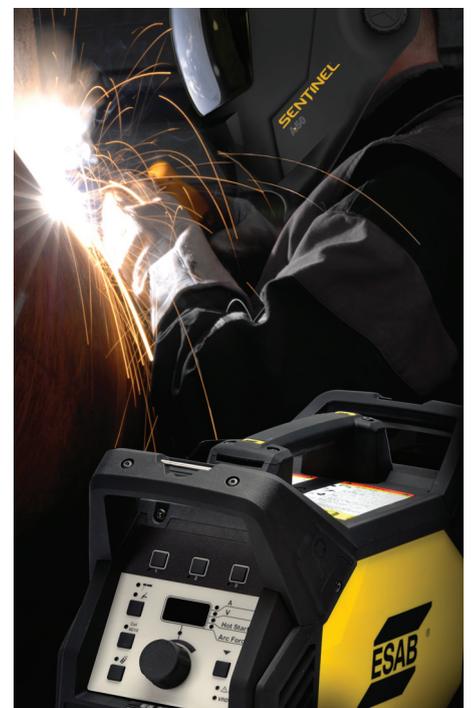
For mechanised cutting, Weldcloud Cut is a web-based application with the ability to combine Columbus™ CAD/CAM nesting data and DataLeap™ production data. Because ESAB uses an open-architecture, WeldCloud Cut and WeldCloud can interlink all of the production data in a business, across all departments. Operating, machine and quality management data are collected.

This brings complete transparency to production flows, including order processing, process times and more, so users can see immediately where optimisation is possible.

### Industrial welding demonstrations

For greater productivity and better quality when pulsed MIG/MAG welding aluminium, ESAB will demonstrate its upgraded Aristo® MIG 4004i Pulse power source, enhanced Aristo Feed 3004 wire feeder and the new MA25 Pulse Panel for aluminium. The highly intuitive MA25 Pulse comes with 30 pre-programmed synergic lines for aluminium wire and uses icons, push buttons and digital displays to simplify use and eliminate language barriers.

ESAB will also demonstrate PURUS™, a next-generation mild steel wire specifically formulated to reduce post-weld cleaning of spatter and silica islands. Simply by switching to PURUS premium MIG wire, users can reduce post-weld cleaning time and unplanned downtime associated with spatter, reduce or eliminate downtime for removing silica islands in multi-pass welding and reduce or eliminate paint-related quality issues. PURUS will be showcased in a



Marathon Pac™ bulk wire system as part of ESAB's robotic welding demonstration featuring the Aristo MIG U5000iw power source. This system provides customers with the flexibility to use any MIG/MAG process available, including pulsed MIG.

Additional automated welding displays

SAW. Another live demonstration features ESAB's OK Band series of 30 mm stainless steel strip and strip cladding system that provides a flexible and economical way of depositing a corrosion-resistant protective layer of stainless steel or high-alloy metal on a mild or low-alloy steel.

improves performance. The new DMX Beveler delivers high reliability and maximum uptime through a simple design with fewer moving parts. Advanced Collision Sensing automatically resets after torch crashes, and it doesn't require an alignment check. The DMX Beveler is easy



include live Submerged Arc Welding (SAW) with ESAB's patented ICE™ (Integrated Cold Electrode) technology, which is the introduction of a cold electrode into a twin-wire process. This live demonstration features ESAB's Gantrac 300 column and boom system, the Aristo 1000 AC/DC power source and BlockPacs of OK 10.62 flux. With ICE, users can increase deposition rates by up to 50 percent over twin-wire

### Mechanised cutting

ESAB will demonstrate multiple new technologies and products for automated plasma cutting on its Suprarex™ HDX, a powerful and extremely durable gantry cutting machine with impressive positioning speed. ESAB will debut its exclusive Direct Multi Axis motion bevel cutting system (DMX), a new way of driving bevel torch motion that reduces complexity and

to use because of ESAB's Smart Bevel Technology, also making its worldwide debut. Smart Bevel takes the guesswork out of plasma bevel cutting, simplifies bevel programming, and delivers consistent and accurate bevel cutting results.

To provide the power for ESAB's live plasma beveling and cutting, ESAB will use its iSeries plasma cutting power sources, introduced in Europe last year. Available in 100 to 400-amp configurations for cutting plate up to 50 mm thick, all iSeries models feature a common cabinet and components as well as StepUp™ modular technology, allowing users to increase the output from 100 amps all the way up to 400 amps by adding inverter blocks. The iSeries lowers the cost per cut by using XTremeLife™ Wear Parts for cutting at 300 and 400 amps, which can lower operating cost up to 30 percent on mild steel.



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# Innovative technology cuts sawing costs

### Energy efficiency? Yes, but not at any cost

Electricity savings are only worthwhile if they are not implemented at the expense of efficiency. KASTO paid particular attention to this when developing its new KASTOwin series of bandsawing machines. It resulted in significant operational savings without compromising on cutting performance.

Increasing cost pressures, tough international competition and ever-higher customer demands present significant challenges to manufacturers. On one hand, it is important to be able to offer an increasing variety of materials and sizes of the highest quality and from a batch size of one through to series production. On the other hand, unit costs must be competitive so that in-house production is economical. Finding a happy medium is a difficult task for many.

Sawing technology is continuing to develop against this backdrop. Automatic saws must meet diverse criteria, such as offering high cutting performance, a wide range of applications, minimal idle times, top quality cutting results, high repeatability, ease of use and effective material utilisation. In times of increasing energy costs and ever-longer periods of use, efficiency also plays a key role.

Matthias Eigbrecht, head of the electrical design department at KASTO Maschinenbau in Achern, Germany explains: "Not every measure that improves a machine's energy efficiency is suitable for a user, as the ideas often come at the expense of production capacity.

"When launching KASTOwin, we developed a product range that not only offers high cutting performance, but also has incomparably low energy consumption – and at an acceptable capital cost."



When developing the KASTOwin series, the manufacturer paid particular attention to optimising energy efficiency

### Pragmatic developments

An analysis of all the energy-consuming machine elements and their corresponding power requirements was the basis for the development work. Using the results, KASTO established a series of concepts that would allow energy to be saved in different areas and then evaluated them from a commercial viewpoint.

Matthias Eigbrecht continues: "In other words, we weighed the increased investment cost of the energy saving measure against the possible operational savings. We determined certain measures to be meaningful but others less so and we rejected the latter."

The greatest potential saving lay in the hydraulics system, which is responsible for a significant proportion of the sawing machine's energy consumption. Initially, KASTO tested and compared equipment from different manufacturers and opted for the most efficient.

To complement this, KASTOwin engineers developed an electromechanical saw downfeed. The hydraulics system is now only responsible for workpiece clamping and saw blade tensioning, so it is actuated far less than in the past. Energy saving in this area is approximately 93 percent.

### Modern drive technology uses energy intelligently

For the saw motors, KASTO uses frequency-controlled drives of efficiency class IE3. As a result, cutting speeds from 12 to 150 metres per minute can be achieved. At the same time, the motors are compact and very efficient. Modern servo drives are also used for the material infeed and saw downfeed. Linear guideways and ballscrews ensure efficient, precise power transmission. Users therefore not only benefit from exact and repeatable sawing results, but also from low energy requirements.

All drives are controlled by intelligent converter technology. KASTO has fitted the frequency converter with a DC link (as used in its automated material storage systems), so that excess energy, generated when braking the saw motor for example, can be recovered and used elsewhere in the



Modern servo drives are used for the material infeed and saw downfeed. Linear guideways and ballscrews ensure efficient, precise power transmission

system. In contrast, conventional technology disperses this energy via braking resistance, so it is lost as heat.

KASTO engineers also turned their attention to the weight of the moving elements of the machines. The more weight that needs to be moved for each cut, the more energy is required. Using new methods, dynamic parts such as the saw frame have been designed to be lighter, without having to compromise on vibration damping or quiet operation.

### Rapid payback

Overall, these measures have made it possible to achieve significant improvements in the energy efficiency of KASTOwin machines. Energy consumption is on average 28 percent lower, depending on the sawing application, compared with previous bandsaw models of equivalent size.

Depending on cutting times, annual energy costs for one saw can be reduced by several hundred euros over a single shift, without affecting productivity, and the savings increase pro rata over two or more shifts. The extra investment built into the machine cost, aimed at increasing efficiency, is thus recouped quickly.

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## New XPR300 plasma cutting system

The new XPR300 plasma cutting system from Hypertherm represents the greatest leap forwards in mechanised plasma cutting ever, completely redefining the technology - and the first place it can be seen in action in the UK is at Esprit Automation's Nottingham facility.

The XPR300 performs at its absolute best when mounted on Esprit machines. 15 percent faster cut speeds than the next equivalent system mean production parts can be produced at a more rapid pace than ever before, and with 20 percent thicker piercing capacity on stainless steel it provides unparalleled part design flexibility. The XPR300 is also fitted with advanced power supply technology that provides active, moment-to-moment system feedback and automatically intervenes to prevent errors that can adversely impact consumable lifespan, improving the machine's lifetime running costs. Features such as this mean that the XPR300 has half the running costs of its nearest equivalent, making it not only the most advanced tool on the market, but the most cost effective

option as well. Additional features like Vented Water Injection ensures superior results on aluminium cuts, and connection systems like EasyConnect and QuickLock ensure both torches and consumables can be switched out rapidly, preventing lengthy operation interruptions. Esprit machines provide the best possible operational base for the XPR300 to work from, whether it's the flexible Multibevel machine, or the large-scale, multi-headed Viper.

Esprit Automation and Hypertherm's partnership goes back nearly three decades. In 1990, Esprit chose Hypertherm as their exclusive supplier of plasma cutting technology, allowing both companies to specialise their hardware to complement the other. Almost thirty years on, the relationship is as strong as ever and both Hypertherm and Esprit have continued to develop more and more tightly integrated solutions to achieve higher levels of precision, better cut quality, improved reliability and lower running costs. Additionally, Esprit's specialist Procut CAD/CAM software is fully integrated with



the XPR300, delivering outstanding machine performance.

Thanks to this tight partnership between Esprit and Hypertherm, Esprit is able to maintain huge stocks of genuine Hypertherm consumables alongside their own parts, meaning that operating an Esprit machine with a Hypertherm plasma torch system allows you to source all of your ongoing parts and support from one place. Contact Esprit today to see what the XPR300 and one of their high-precision plasma cutting machines can do for you.

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## Thermal Dynamics to demonstrate market leading plasma cutting systems

Thermal Dynamics, a world leader in plasma cutting technologies, will be on Booth 13E90 in Hall 13 at Schweissen & Schneiden, which takes place in Messe Essen, Düsseldorf, Germany from 25-29 September 2017. The company will have live demonstrations and static displays of a number of plasma cutting products and systems, as well as innovate and cost-saving consumables. Engineers from Thermal Dynamics will be available during the exhibition to discuss customers' mild steel and non-ferrous plasma cutting applications.

One of the highlights will be an Ultra-Cut XT system, incorporating an iCNC XT controller, table and extraction/filtration system. Ultra-Cut has been designed to deliver next-generation productivity for precision plasma cutting on ferrous and non-ferrous materials, but with exceptionally high performance on mild steel. StepUp modular power technology means customers can specify the power level required when making a purchase and/or upgrade by adding extra power modules at a later date when their needs



evolve. With its built-in intelligence, the iCNC enables users to maximise the performance and productivity of the Ultra-Cut system via the intuitive 15-inch colour touch screen interface.

As well as demonstrating the capability of the Ultra-Cut XT when running in fully automated mode, Thermal Dynamics will also be showing the ScrapCutter manual torch option that boosts productivity by making it quicker to cut the leftover metal skeleton into manageable pieces. Operation is simply by means of the torch trigger, and a built-in safety feature inhibits automated cutting while the torch is being used and also during the 20-second postflow period.

Schweissen & Schneiden will be the first opportunity that most people will have to see the new Thermal Dynamics 200A HeavyCut consumables for oxygen plasma cutting applications. These will be demonstrated on an UltraCut XT system

with an Auto-Cut XT power supply, A-Series plasma system, iCNC Performance controller and iHC XT height control system. HeavyCut technology ensures cut quality and precision performance are excellent, meaning that parts can go directly from the cutting table to welding or fabrication without the need for expensive and time-consuming secondary operations. Furthermore, the HeavyCut electrode features multiple hafnium inserts that more than double the life of the electrode, tip and shield cap. This means significantly less downtime is required for replacing consumables, so cutting costs are reduced and productivity is increased.

Alongside the live demonstrations Thermal Dynamics will also be exhibiting a wide variety of cut samples. These illustrate the exceptional capability of Thermal Dynamics' market-leading portfolio of plasma cutting products and systems.

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