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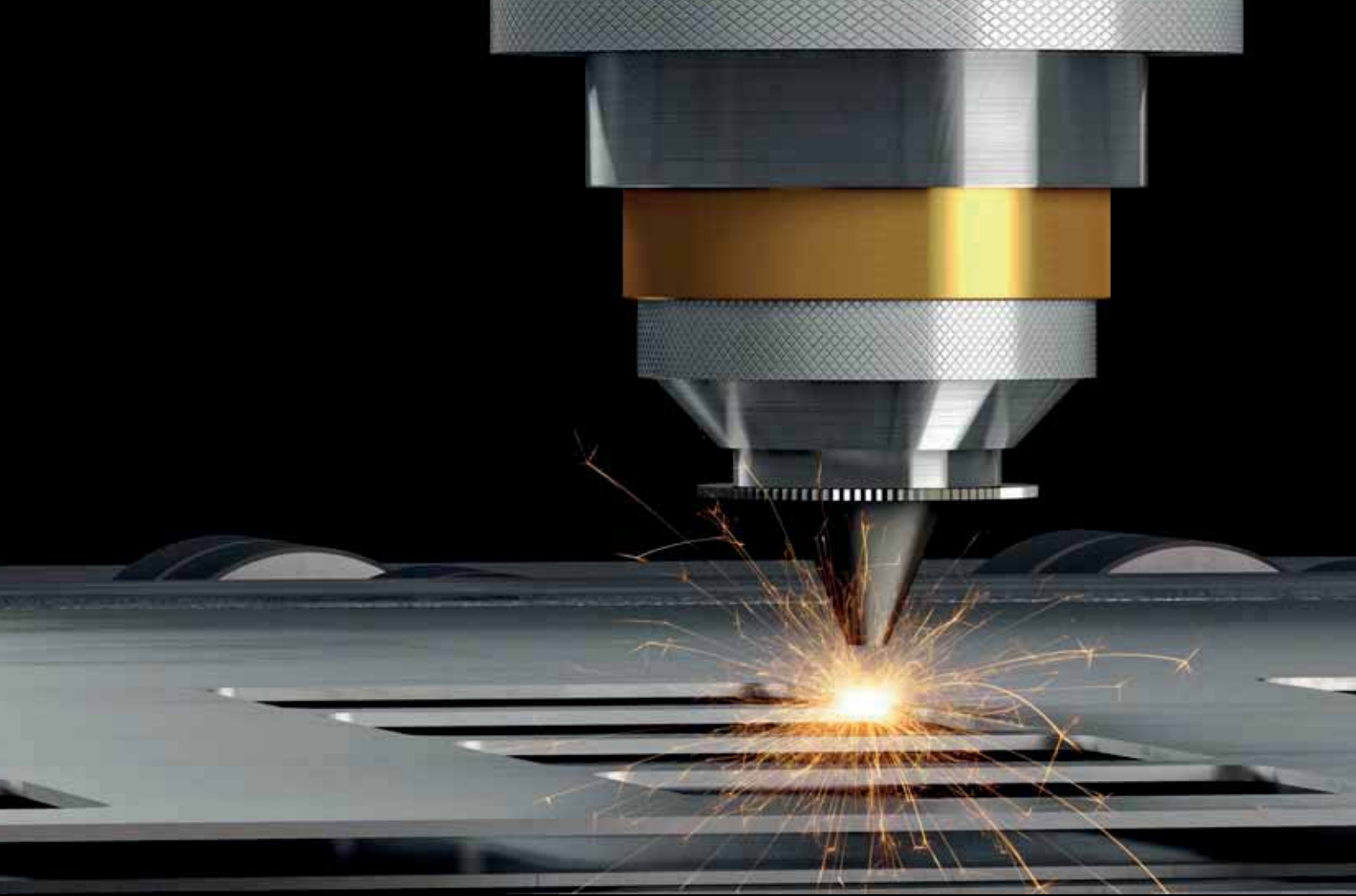
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- MACHINING CENTRES & LATHES
- WELDING

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## Grooving, slotting, parting

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MaxiMill – Slot-SX, the new grooving, slotting and parting off milling system from CERATIZIT with through coolant, provides the highest levels of process security and optimum performance even with diameters as large as 250 mm. The result is improved performance and a reduction in scrap parts.

The existing range of CERATIZIT MaxiMill milling tools with indexable inserts have an excellent reputation among machinists, due to their high-quality standards and broad range of applications. One piece of the jigsaw that was missing though was a slot milling program that would enable customers to machine slots and grooves as well as parting operations in a process-secure manner. To overcome this, CERATIZIT developed MaxiMill – Slot-SX, based on the existing grooving inserts from its SX system to provide a robust and practical solution.



By using an existing range of inserts, the new MaxiMill – Slot SX has the ability to be used across a wide range of materials covering almost everything under ISO P/M/K/N/S categories. As for toolholders, customers can select from standard DIN connections, threads or shell mill adapters making the cutters compatible with all machining centres, milling and turning machines. Key to the development of MaxiMill – Slot SX is the addition of internal coolant supply up to cutter diameter 250 mm. Control of swarf is vital in these applications meaning through coolant brings significant advantages. Potential damage to cutter or component is eliminated therefore extending tool life, along with time savings gained by not having to manually remove swarf from grooves. These issues are compounded the deeper a slot or part off operation goes.

One other aspect of MaxiMill – Slot SX that elevates it above its competitors is its ease-of-use for the operator when it comes to insert changes. Simple handling is essential to smooth changeovers and here the MaxiMill – Slot SX makes use of CERATIZIT's patented SX Clamping Key when changing inserts. The lever design of the SX Clamping Key reduces insert change times while ensuring the correct clamping force meaning eliminating the risk of over tightening, stressing or deforming the insert seat, guaranteeing that the insert is secure in a precise and stable position.

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# New leadership team takes the helm at Ficep UK



Three directors with 38 years combined experience of working at Ficep UK have been appointed to its board to take the business forward into its next chapter of innovation and growth.

Finance director, Pam Allen, sales director, Chris Berriman and operations director, Richard Clark, now take responsibility for the management of Ficep UK, a leading steel fabrication machinery supplier, along with existing company director and group CEO, Christian Colombo.

Finance director, Pam Allen leads on developing, implementing and overseeing the financial reporting processes for the business. She joined Ficep UK in 2010 working on accounting projects before taking the permanent position of accounts manager, working her way up to become finance director this year. Pam Allen has knowledge spanning all Ficep departments and will continue to use her expertise to input into the overall running of the business.

Sales director, Chris Berriman joined Ficep UK as area sales manager for the north of England in 2003. After six years, he became UK sales manager responsible for a team of area sales managers. He is very well known and respected in the industry, having worked at Ficep UK for over 19 years, coming from an engineering background

and prides himself on nurturing and building existing and prospective client relationships. Chris Berriman is also in charge of sales and marketing as well as budget management and company turnover.

Operations director, Richard Clark joined as service manager in 2015. He is responsible for budgeting for the operational side of the business, covering spare parts sales, on demand work, service contracts and also tooling and vending which is growing year on year. He manages a team of engineers and office staff as well as being involved commercially and being a key contact for customers.

The new leadership team will continue to drive forward the UK business which is constantly expanding and growing as the business continues to innovate and becomes more advanced to meet the demands of the industry. The move follows the departure of Ficep UK founder and MD, Mark Jones, who stepped down in July after 23 years leading the business. Mark Jones now takes on a new role as Ficep UK's non-executive director, for a short period.

Christian Colombo, Ficep group CEO, says, "Pam, Chris and Richard are highly qualified and have demonstrated their wisdom in their respective areas as well as in the industry as a whole. They have already played an integral role in getting the business to the stage it is at now and have

the drive and ambition to take it further forward. It's an exciting time for the business and their appointment to the board will continue to invigorate the incredible work that has already been done in the UK. I wish them every success in their new leadership roles."

Ficep S.p.A. was established in 1930 and is located at the foot of the Alps on the northern border between Switzerland and Italy. Ficep has been exclusively engaged in the engineering and manufacturing of machine tools for the metalworking industry.

The Ficep manufacturing complex is comprised of several affiliate Ficep-owned companies that collectively encompass over 1,500,000 sq ft. Each specific facility maintains the responsibility for a specific product or product group to maximise efficiency.

Ficep UK's facility, located on the M62 in West Yorkshire, provides full spares inventory, technical support line and the latest equipment in its range on live demonstration for customer visits. It also has space dedicated for machinery refurbishment and testing in its HQ facility.

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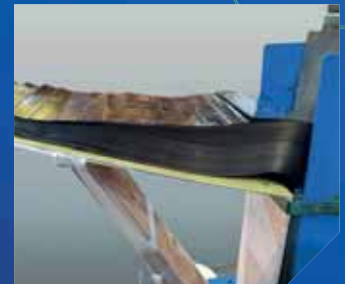
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# Machining centre productivity up five-fold

Robotic component loading and unloading is helping prismatic components subcontractor Hemlock Engineering, Stapleford to unleash the true productivity potential of its latest Brother 5-axis, 30-taper Speedio M200X3 vertical-spindle machining centre (VMC). The result has been a 500 percent increase in production output compared with manually-loaded machines on-site.



The remarkable aspect of this automation success story is that it has been achieved in the most problematic of scenarios, i.e. the production of relatively small batches of components between 1,000- and 2,000-off requiring short cutting cycles of between two and 10 minutes, a combination that necessitates frequent changeover of the production cell.

Hemlock's owner Paul Cobb had exact figures to hand when interviewed: "Typically, one of our 40-taper VMCs runs for 40 hours per week. However, a lot of the time the relatively slow spindle is not cutting. I estimate we get on average 45 percent utilisation. With the robotic Feedio load/unload system serving the latest Brother, we achieve 100 hours operation per week, sometimes more and the uptime of the faster 30-taper spindle is 88 percent.

"On this basis, overall production output is about five times that of one of our 40-taper machines. Additionally, the latter capacity needs the full-time attendance of an operator whereas the Brother cell occupies an operator for only about 20 percent of the person's time. So there is a five-fold reduction in the labour cost content of components produced."

He explains that the plug-and-play Speedio/Feedio cell costs about £800 per week to run including finance, labour and power, which he said "is not very much". It arrived on the shop floor in March 2022 and,

as already observed, produces similar output to five 40-taper machines with full-time operators. That is why Paul Cobb describes the benefits of his first ever automated prismatic component production cell as "absolutely astronomical" and "off the charts".

What makes automation feasible for small batches of relatively uncomplicated components requiring short cycle times is rapid cell changeover within two hours, including swapping the cutting program and tools. It is largely down to Brother's easy-to-use ChipLite conversational software that controls the handling robot and camera vision system.

All that is needed is to key in via a touchscreen GUI the size of the new raw billet, the spacing on the conveyors and the gripper finger data. Connection of the robot program, generated by the dedicated on-board PC, to the VMC control system is via a Profibus link. Paul Cobb asserts that changing over a conventional robot-loaded machining centre and reprogramming it would take days rather than hours.

There are other makes of 5-axis VMC in the Stapleford factory, all 40-taper models. The Brother M200X3, with its 300 x 440 x 305 mm working volume and 16,000 rpm face-and-taper contact spindle, is the first 30-taper 5-axis machine on-site, the other eight Speedios being 4-axis models with a rotary indexer.

The effect of having an additional CNC axis on the M200X3 and using the machine in 3+2 or 4+1 positional mode is to deskill machine operation. It also reduces fixturing costs and balances more closely the machine's cutting cycles with the time required for performing a second operation manually on another machine to finish the sixth face of components.

What tends to happen in practice in Stapleford is that foreman Rob Sinclair sets up the Speedio/Feedio cell when he arrives



on Monday morning. It then runs for typically two days non-stop, virtually unattended, before it needs to be reset. It is the inexorability of component loading and unloading without any stoppages that Paul Cobb says underpins the cell's very high efficiency and production output.

In the first four months of operation, around 25 different components that were previously produced on 3- and 4-axis VMCs had passed through the automated Brother 5-axis cell. The jobs were about to start repeating, with the prospect of even greater gains the second and subsequent times a batch of components is produced.

The benefits of the production solution were so conclusive, that Paul Cobb almost immediately placed an order for a second identical cell, which is due for delivery in December 2022.

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# Even better together

Tebis is a certified partner of DMG MORI Qualified Products (DMQP)

Tebis, a specialist for CAD/CAM and MES process solutions and DMG MORI are offering three customised NC programming solutions from a single source. The Tebis DMQP Power Package for vertical/horizontal milling, the Tebis DMQP Champions Package for 5-axis milling and the Tebis DMQP Ultimate Package for 5-axis mill-turning. They are available from DMG MORI in prime condition under the DMG MORI Qualified Products (DMQP) program.

Tebis AG chairman of the board Dr Thomas Wrede explains: "We see a great match in the strategic alignment of DMG MORI and Tebis. Automating manufacturing processes is a comprehensive procedure that can only succeed if suppliers work together as partners and offer solutions from a single source. The Tebis DMQP packages are an important solution. As a partner in the DMG MORI Qualified Products program, we are pleased to be part of the DMG MORI family and to work together to offer our customers customised solutions focused on digitalisation."

Christoph Grosch, DMQP executive director at GILDEMEISTER Beteiligungen GmbH adds: "DMQP represents a seal of quality for premium components. Along with our selected premium partners, we offer coordinated solutions in this program that meet even the most demanding quality requirements and provide the best performance. Of course, Tebis is one of the preferred partners for DMQP."

Martin Vortmann, Tebis cooperation manager confirms: "Our DMQP-certified CAD/CAM solution packages are technologically matched 100 percent to the specific machine and the corresponding spectrum of parts. They can be purchased and financed to match the machine and they can be used in production as soon as the machine is commissioned."

The bundles that Tebis and DMG MORI are now offering in the DMQP program include the following:

### **Tebis DMQP Power Package for vertical/horizontal milling**

The Tebis DMQP Power Package is designed specifically for the DMG MORI machine for vertical/horizontal milling. It lets users program their machines for milling and



drilling, including tilted machining, with up to five axes.

### **Tebis DMQP Champions Package for 5-axis milling**

The Tebis DMQP Champions Package is designed specifically for the DMG MORI machine for 5-axis milling. This Tebis package lets users program their machines automatically for drilling and milling with up to 5 axes simultaneously.

### **Tebis DMQP Ultimate Package for 5-axis mill-turning**

The Tebis DMQP Ultimate Package is specifically designed for the DMG MORI machine for 5-axis mill-turning. With this Tebis package, users can program their machines for drilling and milling with up to five axes simultaneously and for turning and turn-milling, including complete machining.

Regardless of the selected DMQP package, all users benefit from these proven Tebis modules:

#### **Software training courses**

The participants in coordinated training courses learn about Tebis and its functions and how to use them in a goal-oriented manner that's suitable for the industry, technology and their prior level of knowledge.

#### **Process implementation**

The Tebis Application team configures the

software for the specific requirements and integrates the proven and optimised manufacturing knowledge of each company in what are known as process libraries. All authorised users can then access it at any time, quickly and repeatably.

Tebis also guides its customers on their journey into the digital era of Industry 4.0 and transforms all processes and manufacturing methods into digital CAD/CAM processes. This enables the users to get the best from their DMG MORI machines.

#### **Postprocessor**

When acquiring a Tebis DMQ package, the user receives a postprocessor and a virtual machine that optimally supports all the capabilities of the DMG MORI machine. This includes features like collision checking thanks to integrated simulation technology.

#### **Complete service**

The Tebis DMQP package includes access to all services. This includes personal support and qualified technical support. Maximum availability of the software and fast service response time are key factors for keeping manufacturing processes up and running.

**Tebis (UK) Ltd**

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## Mazak debuts new VC-Ez 16X with 5-axis vertical machining at IMTS

Mazak unveiled its new VC-Ez 16X vertical machining centre and MAZATROL SmoothEz5 CNC, the latest additions to its cost-effective, compact Ez Series, at IMTS in Chicago. The new CNC enables the Kentucky-built VC-Ez 16X to process small complex parts via 3+2 or full 5-axis machining. The machine combines a rugged spindle and space-saving design with a full range of options to meet many production needs.

The VC-Ez 16X provides axis travels of 30" in X, 16.14" in Y and 20.08" in Z, 762 mm x 410 mm x 510 mm, which allows the machine to accommodate maximum workpiece diameters of 18.11" x 19.09" tall and weights up to 507 lbs, 230 kg. All VC-Ez models feature a powerful 40-taper, 12,000 rpm, 25 hp, 18.5 kW spindle and 30-tool magazine. The 5-axis rotary/tilt trunnion table with roller gear cam technology increases part-production capabilities with 360° of C-Axis rotation and -40° to +110° of B-axis tilting capacity. The machine is also equipped with dual lagged ballscrews on each linear axis and incorporates the Mazak MX Hybrid Roller Guide System to ensure rigidity, speed and accuracy.



Options include a versatile 15,000 rpm, 29.5 hp, 22 kW, spindle with 81.13 ft-lb, 110 Nm, of torque and a 30 or 50-tool automatic changer, along with a magazine loading station, dual probe kit and Ez tool station. Plus, various chip-management options including 213 psi through-spindle and Niagara coolant, filter tray, hinge chip conveyor and Mazak's SUPERFLOW 1,000-psi high-pressure coolant system aid in reduced maintenance downtime. For hands-free adjustment, operators can control an optional programmable coolant and/or air nozzle system via M-code or from a separate control panel for 180°+ range of motion and to teach a specific angular location for every tool. The machine is designed to accept standard or customised automation solutions for unattended production and increased productivity.

The MAZATROL SmoothEz5 CNC includes both MAZATROL conversational and G-code programming. The Mazak SMOOTH Machining Configurator (SMC) provides easy, flexible real-time machine/servo optimization for high-speed cutting applications. SMC combines with Intelligent Thermal Shield (ITS), which manages machine thermal stability to create more consistent parts over long periods of time.

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# Investment in automation proves its worth again

Mills CNC, the exclusive distributor in the UK and Ireland of DN Solutions' machine tools, formerly Doosan machine tools, has recently supplied a leading precision aerospace subcontract specialist.

The cell was delivered and installed at ASG Arrowsmith's impressive machine shop facility in Coventry in May 2022 and is being used, at present, to machine a range of pre-production, high accuracy aero-engine parts for the new, ultra-efficient Rolls-Royce Pearl 700 business aviation engine. With the final phase of the certification programme well underway, it is anticipated that the engine will enter service later this year.

Jason Aldridge, ASG Arrowsmith's managing director says: "We are gearing up for full production and, since the cell's installation four months ago, have been focused on designing, optimising and proving out the machining processes for eight Pearl 700 engine parts ready for Production Part Approval Process (PPAP) a standardised aerospace industry process for the design and manufacture of new and revised parts."

The parts being machined by ASG Arrowsmith are all made from aerospace-grade titanium alloys and other exotic materials. They are machined to



exacting tolerances and super-fine surface finishes and are characterised by their complexity and by their intricate features, many of which can only be produced, or produced economically, by using simultaneous 5-axis machining technology.

### The manufacturing cell

The DVF 5000 5-axis machining centre provides ASG Arrowsmith with full 5-axis

simultaneous machining capabilities and, as such, enables the company to machine complex, high-precision parts to completion in a single setup.

The machine acquired by ASG Arrowsmith is equipped with the latest FANUC I Plus control and features an 18.5 kW/12,000 rpm direct-drive BT 40 spindle with through-spindle-coolant capability, 40 m/min rapids, a 500 mm x 450 mm trunnion supported table with a 400 kg maximum load, tool and workpiece probes, integrated thermal compensation systems, spindle and structure and a 120-position ATC.

To improve productivity and process efficiencies, the machine has been integrated with a compact 8-station Automatic Workpiece Pallet Changer (AWC). Each pallet is 350 mm x 350 mm in size and has a 250 kg maximum load.

### The investment decision

ASG Arrowsmith regularly invests in advanced machine tools and automation systems from Mills CNC. In 2018 the company invested in four Lynx 2100 lathes and a DNM 4500 vertical machining centre and, in 2019, invested in its first cobot, an M1017, which was integrated with the DNM 4500 machine to create a compact and flexible automated manufacturing cell.

Jason Aldridge says: "We are key players



in the global aerospace supply chain and, as such, are competing every day with the best manufacturing companies in the world. The investments we make are all geared towards supplying our customers with high-quality, competitively priced machined parts, delivered on time and in budget.

"The relationship we have with Mills CNC is strong and is based on mutual trust. We are advocates of the advanced technologies they supply and the applications and technical support they provide." The company's positive experience from investing in its first automated manufacturing cell and the productivity and process efficiency benefits gained from embracing lights-out, unattended operations, provided the business case and rationale for its latest automation investment.



The investment also demonstrates, unequivocally, that ASG Arrowsmith has bounced back from the impact and effects of the pandemic which, owing to the company's aerospace focus, did hit it harder than most.

### A winning combination

ASG Arrowsmith's position and reputation in the global aerospace sector and its strategic supplier status with Rolls-Royce provided the company, back in 2021, with the opportunity to tender for the Pearl 700 engine components' machining contract. The company's knowledge and experience of successfully tendering for similar

projects in the past, combined with strategic input from Mills' sales and applications engineers were more than instrumental in determining, in advance, the technologies and processes required to compile a winning tender submission.

Jason Aldridge explains: "From discussing the project requirements with Mills, we were able to identify the scope and scale of the new technology investment package. Issues that included part profiles, including size, weight, features, accuracies and finishes, production volumes, customer deadlines, cost-per-part considerations and floorspace limitations, were all factored in and contributed to the selection of the DVF 5000, our first simultaneous 5-axis machining centre and the compact 8-station pallet changer."

ASG Arrowsmith's flexible automated manufacturing cell is currently operating in pre-production mode with machining processes for the engine parts being standardised and optimised to ensure quality, consistency and repeatability. Once the processes have been proved-out and PPAP has been achieved, production will start in earnest.

The cell may well be the company's latest investment in automation but, according to Jason Aldridge: "It won't be the last." The company is actively exploring the acquisition of more cobots to improve productivity levels and further increase its competitiveness.

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# Your gateway to a smarter future

After four years, the sheet metal working community is eagerly awaiting its meeting place for the industry. EuroBLECH 2022, the 26th International sheet metal working technology exhibition, takes place from 25th-28th October at the Hannover exhibition grounds in Germany. Four months ahead of the show, around 1,300 exhibitors from 39 countries already secured their stand space at the exhibition.

Currently, major exhibitor countries are Germany, Italy, Turkey, China, Switzerland, the Netherlands, Spain, Belgium, Poland, Austria, Portugal and the USA. Exhibiting companies have already secured a net exhibition space of 88,600 square metres.

“A lot of innovations have been developed in the past few years, with a focus on cost and resource efficiency. While digitalisation and Industry 4.0 were topics only large companies were realising at the previous EuroBLECH, these key drivers have now reached the factories of small and medium-sized companies too.

Exhibitors at this year’s event will present everything they have on offer to innovate and digitalise the manufacturing process, along the entire sheet metal working technology chain. All these developments are reflected in this year’s motto for EuroBLECH, ‘Your gateway to a smarter future’.

The event will offer everyone in the

community the opportunity to come together and see what the future of sheet metal working looks like. EuroBLECH offers its visitors the possibility to find solutions for the recent challenges in the industry and connects them with businesses from all over the world to help them integrate the latest machinery and software into their manufacturing process. An event that can’t be missed!” says Evelyn Warwick, event director of EuroBLECH, on behalf of the organiser Mack-Brooks Exhibitions.

EuroBLECH is a must-attend event for design engineers, production managers, quality managers, buyers, manufacturers, technical directors and experts from associations and R&D in order to discover the latest trends and machinery in sheet metal working.

Visitors to this year’s show can expect the complete spectrum of intelligent solutions and innovative machinery for modern production in sheet metal working, which are presented in the form of numerous live demonstrations at the exhibition stands.

“With international travel restrictions to enter Germany from abroad fully lifted, we can’t wait to welcome back our international audience to the world’s leading sheet metal working technology exhibition. Our exhibitors are already busy preparing their participation for the long-awaited return of the show in October. Equally, we are getting

a lot of requests from visitors planning their trip and visa,” says Evelyn Warwick.

## Visitor information

EuroBLECH is the largest exhibition for the sheet metal working industry worldwide and is the marketplace to discover and source the latest innovative manufacturing solutions. Numerous live demonstrations at the exhibition stands offer trade visitors the opportunity to experience machines and systems from all areas of sheet metal working in action. The EuroBLECH exhibition profile covers fifteen technology sectors and therefore covers the entire sheet metal working technology chain: sheet metal, semi-finished and finished products, handling, separation, forming, flexible sheet metal working, tube/section processing, joining, welding, additive manufacturing, surface treatment, processing of hybrid structures, tools, quality control, CAD/CAM systems, factory and warehouse equipment as well as R&D.

The exhibitor list, available on the EuroBLECH website, is regularly updated and provides plenty of information on exhibiting companies, such as exhibitor profiles, company videos and contact details. The EuroBLECH e-news, which is sent out frequently ahead of the show, offers the latest news about the event, the exhibitors and the industry sector. The subscription form for EuroBLECH e-news is also available on the website [www.euroblech.com](http://www.euroblech.com). On social media, EuroBLECH can be followed on LinkedIn and YouTube. The official hashtag is #euroblech.

EuroBLECH 2022 will be held in halls 11, 12, 13, 14, 15, 16, 17, 26 and 27 at the Hannover Exhibition Grounds in Germany. The opening times are from Tuesday, 25th October 2022 to Friday, 28th October 2022, from 9:00 to 18:00. The ticket shop is now open for visitors to purchase their tickets to the event ahead of the show. International flight connections, as well as the excellent local infrastructure make the venue in Hannover easily accessible by plane, car and public transport.

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# Your journey towards the future of automation starts here

The presence of Prima Power at the EuroBLECH exhibition fits perfectly with the motto for the 26th edition of the international fair: “Your gateway to a smarter future”. Prima Power invites all visitors to make a journey towards the future of manufacturing, starting from its 1,400 square metre stand where its latest automated, integrated and digitalised sheet metal fabrication solutions are showcased.

Automation and digitalisation are on the rise in all industries and in companies of any size. A growing number of sheet metal manufacturers are embracing these trends to increase productivity, reduce lead times, enhance part accuracy and quality, cut waste and improve ergonomics as well as safety for employees. The upsides of automated and smart production are key to tackling the main challenges in manufacturing industry: skilled labour shortages, high-quality standards, material costs, product delivery, efficiency and sustainability. Of course, solutions must be chosen according to the specific needs of each company and should be flexible enough to keep pace with the growth of the business and ever-changing market demands. Prima Power, with its wide range of modular and flexible technologies, automation, software and its deep-rooted experience, can provide the right solution for the most diverse production and investment needs.

The highly automated manufacturing line exhibited at EuroBLECH is the PSBB, compact Flexible Manufacturing System (FMS) which integrates punching, shearing, buffering and bending processes in a single solution. This comes with the new,



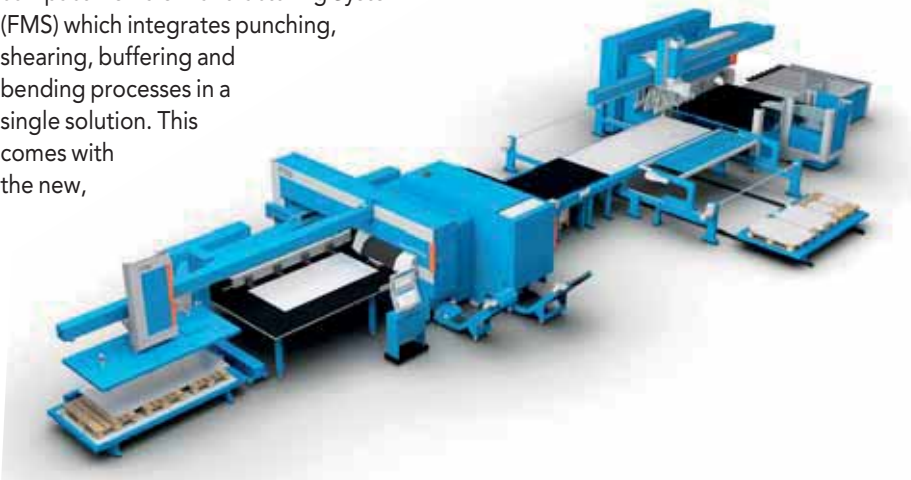
efficient Shear Brilliance® accompanied by the latest version of the EBe panel bender. Leveraging decades of experience in FMS technology, the PSBB line automatically processes blank sheets into ready-bent, high-quality components. It offers high productivity, accuracy and efficiency, utilising servo-electric technology for punching, shearing and bending, with automatic flexible material flow and sophisticated software. The PSBB line is optimal for the production of square parts and panels and can therefore be used in sectors such as HVAC, door and elevator panel manufacturing.

The new Shear Brilliance combined punching and shearing system that is part of the line is based on the latest composite materials, servo-electric technology and linear drives to achieve truly impressive performance that translates into the highest level of productivity on the market for flexible manufacturing. The advantages of modern servo-electric technology are low energy consumption and low maintenance requirements, in addition to excellent

accuracy and versatility. Modularity enables fast, high-precision manufacturing of components that also require forming, bending, tapping and marking in a single, flexible cell and a fully automatic process. By its very nature, the integrated punching-shearing concept can bring savings from 10 percent to 20 percent in raw material consumption. Even greater savings can be achieved using the optional cut-to-length line.

Included in the PSBB line exhibited at the show is the EBe2720, a fully automatic, servo-electric panel bender that maximises system throughput. Thanks to its integration in the FM system, the machine boosts productivity by reducing the whole fabrication process into a single stage, taking advantage of a unique, compact layout. The EBe is equipped with a PCD picking and centring device and a multifunctional table for the positioning and the centring of parts, which allows flow from other machines in line; furthermore, the BTB bend and turning device automatically flips the sheet blanks in masked time, before the bending process.

For flexible automatic laser cutting, Prima Power is showing the Laser Genius+ with a Combo Tower Laser storage system and PSR 2D picking and stacking robot. The high dynamics, trajectory speed of 180 m/min, acceleration of 2.8 g and precision of this machine allow short cycle times and high cutting quality. With three size formats available, 1,530, 2,040 and 2,060, and a wide range of laser power options, the demands of every application can be satisfied. The Laser Genius+ is a “plug & play” machine with quick installation times and a symmetrical and reversible layout that increases ergonomics and ease of





integration into any factory. The machine features two, 24-inch, full HD monitors and a 4K video camera as standard, integrated software modules that simplify processes, new sensors and artificial intelligence algorithms for advanced monitoring and process control. The Laser Genius+ can also be connected to a wide range of Prima Power automation systems.

At EuroBLECH, the machine is configured with the PSR 2D smart and flexible picking and stacking robot, which provides high stacking accuracy and minimal spacing between stacks, allowing optimal usage of the stacking area, automatically. Thanks to the modular structure of the system and Prima Power's wide product portfolio, the PSR 2D can be connected directly to the Night Train FMS storage solution and to an automatic panel bender, creating an automated production line from raw sheet metal to cut and bent finished products. The Combo Tower Laser, a compact and flexible storage system also installed with the machine makes different materials available whenever needed and can additionally serve as intermediate storage for ready cut components and skeletons.



Prima Power will also present the eP Genius 1030, flexible automated bending solution, which integrates an eP-1030 servo-electric press brake with an automatic tool storage unit. In this machine, the high dynamics, precision and reliability of Prima Power's servo-electric technology combine with the advantages of an automatic tool change system. The result is a productive and flexible bending solution, particularly suitable for smaller batches where it is possible to automate the machine setup and shorten cycle times to help the customer achieve higher levels of market competitiveness. Some important features of the eP-1030 are the 105 tonne capacity, 3,060 mm bending length, automatic CNC crowning, 5-axis backgauge and the IRIS Plus angle control system on CNC controlled motorised arms. The tool magazine houses 32 m of tools on eight toolholders that move on three axes. A turret also allows the tools to be rotated, increasing the machine flexibility. The latest generation user interface allows intuitive programming, both on the machine and off-line, as well as automatic management of the machine setup.

Factories are becoming increasingly data-driven, to optimise processes, improve time-to-market, control the full value chain and improve the customer experience. At EuroBLECH, Prima Power will show its full range of solutions for smart manufacturing, allowing production management at any level, with advanced monitoring, diagnostics and enhanced machine programming. In addition to the well known Prima Power software solutions, several new products will be launched at the show, for increased programming efficiency and user-friendliness, simplified machine monitoring and improved control of manufacturing costs.

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# LVD brings the smart factory to life at EuroBLECH

At EuroBLECH, LVD puts the focus on smart manufacturing showcasing interconnected sheet metal fabrication processes with the theme of “Shaping Flows.” On display will be a smart factory cell as well as the latest laser cutting, bending, combination equipment, software and automation, demonstrating flexible solutions to enable a smarter production environment.

## Smart factory Live

The cost-effective smart cell brings to life a smart factory driven by cost-efficient machinery comprised of the LVD YSD LaserONE laser cutting machine, a basic, no-frills fibre laser, LVD Dyna-Cell robotic bending cell for small- to medium-sized parts and CADMAN software.

Dyna-Cell is bending automation at a fraction of the cost of traditional robotic bending systems. Designed to keep cost-per-part low, Dyna-Cell is priced less than the cost of two stand-alone press brakes. It is easily programmed, fully offline, in 20 minutes or less with 10 minutes of program preparation, 10 minutes of tool setup and first part production.

Addressing the market need for an ultra-practical fibre laser cutting machine, LaserONE is designed, manufactured, sold and serviced by LVD. LaserONE cuts a variety of materials and thicknesses, has low operating and maintenance costs and provides a quick return on investment.

The cost-effective smart cell showcases the essentials of smart sheet metalworking, connecting the technology of a fibre laser with an easy-to-justify bending cell and a few basic software modules to increase output and shorten cycle time without a heavy financial investment.

## Versatile and robotised

Shaping flows using flexible cutting, bending and punching processes will be demonstrated. The high-power 20 kW Phoenix FL-3015 processes a range of materials in thicknesses up to 40 mm. The 20-kW machine cuts up to 2.5 times faster than a 10 kW fibre laser. It pierces and cuts thick materials at rates faster than most plasma cutting systems.

The Ulti-Form robotic bending system handles small batch and long production runs with equal efficiency, delivering high productivity and consistent bending accuracy. Ulti-Form offers a fast “art to part” process. CADMAN-B software automatically calculates the optimal bend program and imports bending data to the robot software CADMAN-SIM and no robot teaching is required. SIM automatically calculates gripper positions, generating the fastest collision-free path for the robot and relays the information back to B, enabling the operator to work with a single program.

The Strippit punch-laser combines the punching and forming advantages of the Strippit V Series punch press with the speed and versatility of fibre laser cutting to complete multiple processes on a single machine, answering the need for flexible manufacturing.

The new Dyna-Press 60/20 electric drive press brake offers 60



tons of pressing force and 2 m of bending length for the most capacity of any Dyna-Press machine.

## Centralised and seamless

LVD continues to drive a smarter factory with its integration philosophy and a complete suite of CADMAN® software products all designed to shape process flow: CADMAN-JOB (Manufacturing Execution System), CADMAN-SDI (Smart Drawing Importer), CADMAN-B (bending), CADMAN-P (punching) and CADMAN-L (laser cutting).

LVD is named after its founding fathers: Jacques Lefebvre, Marc Vanneste and Robert Dewulf. Established in the 1950s, LVD gained recognition as a precision press brake manufacturer. Significant growth in the 1990s, which included the acquisition of Strippit, Inc. in 1998, a US-based manufacturer of turret punch press equipment and the addition of laser cutting products to its portfolio, helped position the company as a leader in laser, punching and bending technology.

Today, LVD offers a full range of integrated products for the global sheet metalworking market. The company has five manufacturing facilities and is active in more than 45 countries following the principle of localised sales and service for each region.

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**Stand: 12-F104**

## New solutions from Bystronic

Bystronic will launch a groundbreaking software solution for sheet metal manufacturing customers at EuroBLECH. With the new BySoft Suite, customers can holistically digitalise their business, from quote to delivery.

The high powered ByCut Star 4020, the new flagship of the Bystronic laser cutting systems, convinces with smart features such as the Intelligent Cutting Process (ICP), Automatic BeamShaper and Parameter Wizard which optimises the entire cutting process.

The compact solution for bending requirements, the new ByBend Star 120, offers bending technology for the highest demands on process speed, accuracy and energy efficiency where the applications are too big for a "small" machine and too small for a "big" machine.

The ByTube Star 130 tube laser cutting system and the BySmart Fiber laser cutting system are now available with more laser power. The ByTube Star 130 comes with 4 kW and the BySmart Fiber with 12 kW.

Bystronic is a leading technology



company in the area of sheet metal processing. Its high-quality solutions enable transformation into a productive and sustainable future. The focus is on the automation of the complete material and data flow of the cutting and bending process chain. The intelligent connectivity of its laser cutting systems and pressbrakes with innovative automation, software, and service solutions is the key to comprehensive digitalisation in the sheet metal industry. Its company headquarters are located in Niederönz, Switzerland.

Bystronic UK provides today's UK and Irish manufacturer with laser cutting, bending and automation systems along with software that streamline the process chain

and minimises waste to increase profit. Located in Coventry, Bystronic UK provides sales, service, training and support to customers throughout the UK and Ireland.

Established in the UK for over 100 years as both Edwards Pearson and Pullmax UK, Bystronic UK has vast experience and is centrally located to support the UK industry.

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**Stands: 12-A73, 12-A104, 12-B53, 12-B104, 12-A66, 12-B66**

## Digitisation and networking in focus

At EuroBLECH, CLOOS will present innovative technologies from entry to premium level and from manual welding machines to chained robot systems. Visitors to the CLOOS stand can experience the wide range of products for manual and automated welding. The focus of the exhibition stand will be on the topics of networking and digitisation. "The increasing fusion of the physical and virtual worlds enables optimal control and continuous improvement of manual and automated welding production," says CLOOS managing director Stephan Pittner. "Therefore, we are constantly expanding our range of digital solutions."

With the C-Gate IoT platform, users can access information from their welding production in real time. All information is entered and processed centrally in an integrated information and communication tool. This allows users to monitor and control their production processes down to the smallest detail. It consists of several modules which users can activate depending on their individual digitalisation strategy, consistently from the manual



welding power source to the fully automated production line.

The CLOOS RoboPlan software also enables offline programming of automated robot welding systems. RoboPlan allows the generation of welding and travel paths as well as sensor routines at 3D models and their direct transfer into the robot controller. This increases the system utilisation, optimises the production process and makes welding more flexible.

"We want to close automation gaps and increase the efficiency of the manufacturing processes," Stephan Pittner emphasises. "Therefore, we offer solutions for automated welding." The QIROX system includes the robot technology, positioners,

safety technology, software, sensors and the interface to the process technology. The modular design allows scalable solutions which can perfectly match different applications and the individual production requirements.

The portfolio comprises simple, compact standard systems as well as complex, chained systems with automated workpiece identification and loading and unloading processes.

A highlight of the exhibition stand will be the automated high-tech production line that shows different welding processes as well as upstream and downstream production processes. Stephen Pittner says "More and more often, our customers want to integrate automated welding technology with handling and grinding applications in one production line."

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**Stand: 26-H52**

# MACH prize win leads to further investment at HepcoMotion

HepcoMotion is a leader in linear motion technology, with its linear guide systems featuring V guide technology being used by machine designers across a wide range of industry sectors, including food processing and packaging, automotive, renewable energy systems and medical. Continued product development and increased demand resulted in a need to invest in machine tools that would both improve productivity and enhance existing capacity. A visit to the XYZ Machine Tools stand at the recent MACH exhibition made that investment a little easier.

HepcoMotion's engineering manager, Ryan Berry was investigating improvements in the machining of ballscrews to support a new product launch planned in the near future, so a turning centre was on his list. There was also a need to upgrade milling capability to relieve capacity in the production. While on the XYZ Machine Tools stand, he was invited to fill out his details to be entered into the now traditional XYZ prize draw, the winner of which would receive either the free use of a bed mill for 12 months or the option for a £10,000 discount off any machine in the XYZ range. On being advised of his success in the draw, Ryan Berry chose the latter and placed an order recently for an XYZ CT 65 HD turning centre as his machine of choice.

"We needed a turning centre that was capable of efficiently machining our hardened ballscrew ends, and the design of the CT 65 HD with its hardened box ways meant it would be robust enough for that work," says Ryan Berry. "The machine also had the advantage of ease of programming and quick changeover, making it ideal for both low and high-volume work. At HepcoMotion we have built the business on



the fundamentals of quality products, excellent customer service and cost-effective products. We see the same mindset at XYZ Machine Tools. We placed the order and were surprised to be advised that delivery would be within four weeks. With the machine now in-situ, XYZ is providing operator training for eight of our people which is split over two groups."

The XYZ CT 65 HD sits within the XYZ Machine Tools turning centre range and features the Siemens 828D ShopTurn Touchscreen Control, a 23 HP/17 kW/4,000 revs/min spindle, 66 mm bar capacity, 12 position Sauter VDI turret, along with a parts catcher, remote electronic handwheel, swarf conveyor and Renishaw automatic tool setting arm as standard. While retaining a compact footprint of just 2,950 x 2,030 x 1,650 mm, including the swarf conveyor, the solid cast construction weighs in at 3,600 kg, giving it exceptional rigidity. The machine installed at HepcoMotion has been enhanced with the addition of a bar feed unit. This allows ballscrews up to 3.5 m in length to be processed and, with the relocation of an existing XYZ bed mill, a dedicated machine cell has been created for ballscrew production.

With the order and delivery of the XYZ CT 65 HD complete, attention switched to milling, which was what Ryan Berry had originally gone to MACH to see. Here he was looking to improve efficiency on one-off and low-volume production by replacing older machines with the latest technology. Having seen the latest XYZ RMX 5000 bed mill with the touchscreen ProtoTRAK control system and a smaller XYZ KMX SLV turret



mill, he was convinced that this pairing would provide the enhanced productivity within a toolroom environment. These two machines were delivered on the 15th July and will quickly be in operation following operator training.

The RMX 5000 machine adds capacity with its 1,930 x 356 mm table and a programmable 7.5 kW/5,000 revs/min spindle.

Ryan Berry concludes: "These two machines will relieve pressure on our production machines by providing a toolroom capability for one-off components and low volume production. This investment is part of our ongoing development of the business here in Tiverton, along with expansion of our other manufacturing plants. This year will see a further £2 million spent on 14 machines across our manufacturing capability, with 12 destined for Tiverton and two earmarked for our new facility in the Netherlands."

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# Reshoring and exports boost subcontractor's growth

In response to an upturn in business over the past few years, Merseyside subcontract machining company Wealdpark is to treble the size of its factory. The first phase of expansion, due to begin immediately, will add an extension a little larger than the 6,000 sq ft unit it presently operates in Sutton Road, St Helens. By the end of 2023, another 5,000 square foot unit is scheduled for completion on an adjacent plot that was purchased recently.

Mainly a precision turned parts subcontractor, the family owned and run firm operates two vertical machining centres and 15 sliding-head lathes on the shop floor, alongside six Miyano fixed-head turning centres from Citizen Machinery UK.

The latest to arrive, in April 2022, was a Miyano ABX-64SYY, bringing to four the number of these 65 mm diameter bar capacity machines purchased since 2014. In use also are 51 mm and 42 mm capacity models. All have twin spindles and twin 12-station, Y-axis turrets with driven tooling for efficient, one-hit production. Despite the machines being bar fed, 40 percent of the time they are employed for turning billet in 6-inch and even 8-inch chucks, enabling the production of much larger diameter parts with an operator in attendance.

Together with father Jim and brother Steve, Phil Smith is a director and joint owner of Wealdpark. He says: "We have increased turnover by a quarter in the two years since the start of the pandemic and sales during each of the first five months of 2022 were at a record level compared with previous years.

"Production of parts for the hydraulic,

pneumatic and yellow goods industries is particularly strong at the moment. We are also active in the aerospace, automotive, electrical fastener, fire-fighting, military and temperature measurement sectors.

"Manufacture of parts for ventilators has been an established part of our business for many years and it of course continued through 2020 and 2021. We have been able to turn this into a growth area by supplying similar components to Europe and North America.

"Admittedly part of the rising sales figures is down to an increase in material costs but the underlying growth is undeniable, due in part I believe to the trend towards reshoring.

"It has given us the confidence to invest in new infrastructure and capacity to develop our business and part of that strategy will be the continuing purchase of top-quality plant like Miyano lathes, which we have used since 2007."

There are no other makes of fixed-head turning/milling centres in the factory. It is because once Wealdpark's directors had satisfied themselves that the Japanese-built machines are of good quality and value, reliable and accurate, the acquisition of further similar lathes provides the flexibility to be able to swap tools and programs easily across the shop floor.

In fact, it was other members of the British Turned Parts Manufacturers Association (BTMA) that recommended the Miyano brand in the early days when the subcontractor was transitioning from a cam auto shop with 53 machines to a fully CNC-equipped company. The process

started in 2001 and was complete within a decade.

Both Phil and production manager Neil Ireland are waiting for Citizen to introduce its Low Frequency Vibration (LVF) chipbreaking software, which is already available on a pair of 42 mm bar capacity Miyano models, to larger machines in the series. It will certainly be adopted in the St Helens factory, as it will be ideal for automatically breaking up stringy swarf into manageable chips when machining certain materials.

These include highly ductile C101 copper, much of which is turned, milled and drilled in the St Helens factory for producing electrical components and AMS5629, a martensitic, precipitation-hardening stainless steel used widely by the aerospace industry. Both are problematic in their tendency to birds-nest when machined, as are aluminium and a number of plastics. Even EN3B mild steel, which is supposed to have good machinability, is proving difficult to turn without swarf clogging the working area, due perhaps to the current shortage of good quality material.

Another issue that occupies Neil Ireland's thoughts is whether to continue using twin-turret fixed-head lathes or progress to triple-turret models. For example, instead of



the latest ABX-64SYY 9-axis CNC lathe with upper and lower turrets, Citizen Machinery could have supplied a 12-axis Miyano ABX-64THY with a third Y-axis turret positioned above the spindle centreline. All three tool carriers can be in cut simultaneously to achieve very high levels of productivity.

His view for the time being is that the extra time required for setting such a lathe and then programming it to incorporate the movements of a third turret cannot be justified for Wealdpark's relatively small batch sizes of typically between 1,000- and 3,000-off. Additionally, the upper turret of the Miyanos on the shop floor often holds a U-Drill of large diameter for reverse-end axial machining and a third turret would restrict its movement. Nevertheless, the potential offered by a three-turret solution is constantly under review.

Notable also regarding the fixed-head lathes is their speed of production, despite their large size. Occasionally, when the sliding-head lathes are particularly busy, a production run is transferred to a fixed-head lathe with very little increase in cycle time. One component machined from 20 mm hexagonal bar, for example, takes 28 seconds to produce on a sliding-head lathe with gang tooling and only 32 seconds using a 65 mm capacity Miyano with turret tooling.

Generally, Wealdpark operates a 37-hour week and sets up all lathes at the end of the day for a considerable amount of unattended machining of free-cutting materials overnight and into the weekend. However, the recent increase in workload has necessitated occasional three-shift attendance and 24/7 operation.

Reliable autonomous operation of the Miyanos is ensured by comprehensive load monitoring of both spindles and of the three



linear axes of both turrets, as well as of the live rotary tools. The parameters of each channel can be set separately according to the job to ensure safe operation combined with minimal disruption to production.

Programming is carried out mainly at the FANUC Series 30i-B control on the shop floor, although offline-created content is sometimes added including engraving and deburring routines generated using the Alkart Wizard programming software provided by Citizen Machinery.

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## New Nakamura JX-200

Taking its leading turning technology to a new level, Nakamura-Tome has now introduced the new JX-200 multi-tasking mill/turn centre. Available in the UK from the Engineering Technology Group (ETG), the JX-200 incorporates Nakamura's new NT Smart Cube which is the world's shortest tool spindle in its class. It provides a compact footprint with a spacious work area and unrivalled kinematics that drastically improve machining performance.

Nakamura has recognised the increased need of industry to manufacture smaller batch sizes with higher flexibility. With customers wanting 'more flexible machining' and 'higher part production' rates with a single machine, the JX-200 is the solution. This new machine can accommodate a larger number of tools and this delivers unrivalled flexibility for handling multiple types of low-quantity production.

The impressive new JX-220 is a twin-spindle machine with an upper tool spindle that swivels +/-95 degrees to provide exceptional flexibility. This unit has an impressive 15/11kW power output and a

12,000 rpm spindle with an 18,000 rpm spindle as an option. The upper tool spindle has an 80-position tool carousel as standard with 40 or 120 tools as optional extras.

On the lower tooling turret as standard is milling capability and also Y-axis machining. The lower turret provides a 6,000 rpm milling spindle with 8,000 rpm optional and both upper and lower milling capability is extremely rigid and robust for heavy-duty material removal applications.

In combination with the upper tool spindle and the lower turret, the new JX-200 machine is perfect for a multitude of different machining methods such as simultaneous machining with both left and right spindles, engaging both upper and lower tool positions simultaneously, and even machining with centre support mounted on the lower turret. Whatever your application, the JX-200 is the epitome of flexibility for your machining tasks. With the facility for operations such as turning, milling, drilling and gear cutting, this machine will appeal to manufacturers in an extremely wide variety of industry sectors.



The machine has a 65 mm bar capacity with 51 and 80 mm diameter options. The 65 mm machine has a maximum turning diameter of 325/255 mm with a maximum turning length of 1,058 mm. All this is crammed into a compact floor area of 2.9 m by 5.2 m. With the Nakamura-Tome JX-200, ETG can change the impossible to the possible.

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# Transition to cost savings is fluid with ROCOL

Bristol-based Nerc Precision Engineering (NPE) Ltd has been on a rapid growth trajectory since its inception in May 2018, marking the fourth anniversary of its founding with the recent installation of a DMG MORI CMX600V machining centre. Investing in prestige technology is a philosophy of the small business and this has been highlighted with its newly formed partnership with cutting fluid specialists ITW ROCOL.

Commenting upon the growth of the business, managing director Konrad Nerc says: "When my wife and I started the business, we aimed to invest in the best technology to ensure that we can deliver the highest quality components and service with lead times and pricing that would be the industry benchmark. As a small and agile manufacturer with innovative technology investments that include 5-axis machining, our philosophy and customer service is enabling us to evolve rapidly."

In the last two years, the subcontract manufacturer has invested in a DMG MORI DMU50 5-axis and a CMX600V 3-axis machining centre that is supported by zero-point clamping from Lang, cutting tools from CERATIZIT, Hoffmann and Tungaloy and of course cutting fluid from ITW ROCOL. Producing everything from one-offs and prototypes to batch production, the ISO: 9001:2015 subcontract manufacturer typically services customers in the defence, offshore, automotive and general subcontract sectors with the aerospace industry rapidly emerging as its most prominent market sector.

Like any fledgling business, finding the best quality products and services is a learning curve and this has certainly been the case for the company, located near Bristol airport, when considering its cutting fluids. Konrad Nerc explains: "Our initial cutting fluid supplier was a well-known name in the industry, but the quality of the fluid was quite poor. The fluid consumption was high, the coolant left a lot of residue on our components, we suffered from tramp oil and foaming and the staff also suffered with skin irritation. We soon moved to a very high-end brand of cutting oil. This premium brand eliminated tramp oil, foaming and skin irritation for staff while the consumption was also reduced and it improved tool life and surface finishes. However, we found the



poor service unacceptable, especially considering the increased cost for a barrel of oil. We eventually moved to a third vendor with a brand equally well recognised as a premium product. While the quality of fluid, performance and cost were relatively similar to the second supplier, once again, it was the service and support that was lacking."

## Finding the perfect partner

The trial-and-error process led Konrad Nerc to cast a hopeful query on LinkedIn for advice and support. It was here that Ian Fenney, the metalworking segment specialist from ITW ROCOL answered the call for help. Konrad Nerc continues: "Ian came to visit us and investigate our cutting fluid requirements. Following an initial consultation, we trialed three different ROCOL fluids. Trialling more than one product was due to the diversity of the materials we were cutting, the varying operations and machining parameters and some of the products were new to market for ROCOL. ROCOL emptied and cleaned the sump of a machine and we tried our first fluid. The results were impressive, the quality of the fluid was excellent and the support has been second to none."

Since the trial commenced last year, Nerc has won a series of new customers and sizeable orders in the aerospace industry, with work in this sector now accounting for

95 percent of turnover. This has seen the materials machined narrow from stainless, steel, copper, brass and a multitude of ferrous and non-ferrous materials to primarily aluminium and aerospace-grade alloys. With this evolution, ITW ROCOL identified its TRI-Logic cutting fluid as the most suitable solution. The TRI-Logic range consists of maximum life extreme pressure cutting fluids that demonstrate excellent inherent stability and cutting performance that improves surface finish and tool life while reducing foaming and odours. Furthermore, as a fluid formulated from a unique blend of specially selected additives that maximise sump life, TRI-Logic also offers excellent corrosion protection.

## The outstanding results

To undertake the trial, ITW ROCOL supplied a 55 litre barrel of its industry-leading TRI-Logic to Nerc. This barrel was utilised in the initial trial that required the emptying and cleaning of one machine sump to demonstrate the difference between ROCOL and its fellow 'premium brand' rivals. With the results rapidly becoming evident, the remainder of the barrel was used to continually 'top-up' the fluid of the remaining three machines to limit the disruption to production while delivering maximum results for Nerc.

The fluid life has improved drastically and



oil consumption has reduced by over 50 percent. Logic would tell any engineer that a 50 percent consumption reduction would naturally reduce the fluid costs by 50 percent, yielding a huge saving. However, the ITW ROCOL TRI-Logic EP has a retail cost 50 percent less than its rival premium brands. With a 50 percent reduction in the purchase price and a 50 percent fluid consumption reduction, the savings are staggering.

Konrad Nerc enthuses: "The 50 percent cost reduction is something that every small business wants to take advantage of, but when the consumption also reduces by 50 percent, the cost of coolant stops being a concern. The initial 55-litre barrel lasted from July to February and we have recently taken delivery of a 200-litre drum of TRI-Logic. Our initial projections were that ROCOL's TRI-Logic would provide a cutting fluid consumption reduction of 25 percent. However, with the new aerospace work, we are running four machining centres up to 16 hours a day and we are busier than ever before. Running at optimal production rates, we are recognising that our cutting fluid consumption is at least 50 percent less."

The performance of the two previous premium brands far exceeded that of the first brand used by Nerc in terms of extended tool life, sump life, improved



surface finishes, a reduction in foaming, tramp oil, oil residue on parts and skin irritation. The ITW ROCOL TRI-Logic has matched and even exceeded the performance of its rival brands in all areas.

The 200-litre barrel of ITW ROCOL's TRI-Logic high-performance cutting fluid has been supplied with an automatic fluid mixer that accurately mixes and dispenses the correct dilution of cutting fluid and water. With a built-in double check valve and vacuum breaker that is Water Regulations Advisory Scheme (WRAS) approved, the system meets the most stringent of safety requirements for category 3 fluids and ISO EN: 1717 regulations. Fast, efficient and easy-to-use, the mixing station always ensures that Nerc Precision has the optimal fluid concentration in its machine tools.

"For our business, specifying cutting fluid has been the hardest thing to get right and find an improvement. Unlike capital and ancillary equipment, the challenges with cutting fluid can be the most difficult aspect of the business to get right. The challenge of trialling new coolants has several implications. For example, emptying and cleaning machines to trial fluids can be time-consuming with machine downtime and then there is the

concern that the new fluid may not improve your productivity, fluid life and tool life or it may not be compatible with the materials machined. There is also concern over tramp oil, foaming, residue on components, skin irritation, disposal and much more.

Thankfully, ROCOL resolved all of this and the results have been fantastic. ROCOL has an extremely honest approach. They said their fluids would work and they do. ROCOL doesn't just 'talk the talk', their cutting fluids also 'walk the walk'. The previous premium brands we tried improved performance, tool life and surface finishes over the first fluid we tried. ROCOL has exceeded the performance of these fluids while reducing our consumption and costs," says Konrad Nerc.

#### Setting the standards with service

With service and support from all three of its previous cutting fluid vendors being an issue for Nerc Precision, Konrad Nerc concludes: "The service and support from ROCOL is second to none. They reviewed our business, listened to our concerns and then provided a solution that has exceeded everything else that went before. Most importantly, a ROCOL engineer is always on call to check our machines and support us accordingly. We couldn't ask for better support."

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## Next generation fluid management

### A new wave in fluid management

Jemtech has drawn on decades of experience and expertise and used this knowledge to create its latest innovation, the new Autofill Plus. With a footprint of only 300 mm x 320 mm and standing at only 700 mm high, this state-of-the-art system holds 50 litres of concentrated cutting fluid, automatically topping up the sump with up to 5,000 litres of precisely mixed coolant, maintaining critical stability, reducing consumption and improving performance.

### What's the Plus for?

In addition to the standard Autofill, the Autofill Plus also automatically monitors concentration, pH, temperature, conductivity and sump levels. All of this is controlled and monitored through Jemtech's unique fluid analytics data hub, securely and easily accessed via any computer, laptop or tablet.

### Why is CNC fluid management important?

The importance of maintaining and improving stability while increasing productivity has never been higher for UK manufacturing. Rising material and running costs are putting incredible pressure on businesses to remain profitable.

As a leading OEM of advanced fluid management systems, Jemtech continuously invests in technology and processes to provide a full range of solutions to improve efficiency and stability of metal working business throughout the UK.

### Is it possible to maintain quality and profit?

Jemtech has been helping UK businesses improve health & safety, process stability



and productivity on the factory floor with better cutting fluids, mist extraction and automated products for over 25 years. Its company philosophy is to improve customers profitability through focusing on higher standards in quality production, ensuring longer machine running time, increased tool life and resulting in an improved working environment.

### CNC fluid management system

Jemtech's range of CNC products are already tried and trusted by some of the country's leading engineering plants. For more information on Jemtech's range of advanced fluid management systems, visit the Oracle fluid management web page, or you can contact Jemtech now and a member of the team will be able to answer your questions.

Jemtech UK Ltd was founded in 1996, with

the main objective of becoming and then remaining the leading supplier of advanced fluid management solutions. Jemtech has become acknowledged as a market leader for the quality of its service, customer support, and best in brand products.

It believes that continuity is extremely important for customers and it is proud of the fact that many of its team members have been with the company since it started, assuring you that Jemtech is a reliable, pro-active and effective solution provider.

All sales, service and application personnel have originated directly from the precision engineering industry and they are also fully trained in all aspects of the metal working fluids, focusing on lowering the cost of your manufacturing processes.

The company also understands that good relationships are mission critical for all parties and these relationships are based on positive experiences which are gained through regular contact, trust, substance, communication and respect.

Jemtech supplies all the major market sectors of high-quality precision engineering industry including aerospace, medical, automotive, defence, toolmaking, petrochemical and power generation. Customers range from the smallest subcontractor all the way through to global OEMs.

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# Multifunctional, two-component machining fluid: Oemeta's Hycut explained

Knowing where to start pitching a product that has so many benefits is not a problem Oemeta thought it would have. But it is. Therefore, after years of testing various presenting methods, it was decided that a short explainer video was needed.



HYCUT is a unique concept that was developed in 1993 by Oemeta for one of the giants in the automotive industry. Since its first inception, HYCUT has evolved and been fine-tuned for use in most industries, applications and materials, creating complete fluid system for every aspect of CNC machining.

HYCUT can be used as a neat/machining oil, coolant, lubrication oil and washing fluid. Provided only HYCUT products are used, this compatibility means that all fluids in the machining process create no waste. Hydraulic and slideway oils that would have previously leaked and resulted in tramp oil are, instead, recycled as they are able to mix in with the HYCUT coolant, improving lubricity and performance while reducing total cost.

To allow this flexibility, HYCUT is made up of two components: an oil element and an additive package. Both components have variations of specification and can be mixed and matched depending on the machining requirements. Quantities of each component can also be managed independently, allowing for ultimate product optimisation and a vastly increased product lifespan.

In addition, HYCUT is based on synthetic or native ester oil and is free of mineral oil, making it both environmentally friendly and super-efficient, allowing businesses great results from their HYCUT machining. Finally, to monitor concentrations, specialist test strips have been developed by Oemeta, giving users ultimate control.

Oemeta UK's managing director, David Woodford says: "HYCUT is a product that has so many advantages, it is difficult to know how to pitch it to potential customers. Every business is unique, but all are looking at improving their production process and reducing total cost. This is where introducing HYCUT into workshops really pays off. Although HYCUT is not always suitable for every shop floor, it is always something that is advantageous to know about especially as so many businesses are experiencing growth and process change".

To gain a better understanding of many of the advantages of HYCUT, watch Oemeta's video here:

<https://www.youtube.com/watch?v=x-5JdkdIIVg>

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# FANUC UK to unite automation community in bid to address labour crisis

In a bid to address the ongoing manufacturing labour crisis, FANUC UK is uniting a collective of automation experts, bringing together more than 30 leading names from across the automation and robotics industry to debate and discuss the most pressing issues facing the manufacturing sector today. Giving visitors a behind-the-scenes, all-access pass to its cutting-edge automation facility, FANUC UK will open the doors to its Coventry HQ on 2nd-4th November. The event will also feature live robot demonstrations and hands-on robot training and will showcase the next generation of industrial robotics talent, offering visitors the chance to pit their skills against this and previous years' WorldSkills UK finalists.

### Debate and insight from automation experts

Thought leaders from FANUC UK, including MD Tom Bouchier and new head of sales Oliver Selby, will be joined by renowned automation experts such as Phil Hadfield from Rockwell Automation and representatives from FANUC's system integration partners. The Open House morning sessions will feature a series of free talks, panel discussions and interviews with



automation leaders keen to share their experiences and highlight the many real-world benefits that robotics and automation can deliver to UK manufacturers.

Shining a spotlight on the latest developments in industrial automation, they will reveal how robots can help manufacturers address the current labour crisis, boost productivity and improve

quality and consistency. Sessions on digital transformation, upskilling and cobots will be accompanied by debates on harnessing the power of partnerships and investing in apprentices, among many other hot topics. Visitors can also speak directly to industrial automation experts from FANUC and its partners, gaining valuable support to help them on their own digital transformation journey.

"Historically, UK manufacturers have been slower to the robotics revolution than their international counterparts, but the International Federation of Robotics (IFR) has revealed that the UK is now one of the top 15 countries for annual installations of industrial robots, with figures rising by 8 percent in 2020," says Oliver Selby. "Partly as a result of labour shortages prompted by Brexit and the pandemic, demand for robots in the UK is expected to grow further. We look forward to showcasing the benefits that automation can bring, providing real-world insight into the key issues facing the manufacturing sector and addressing any lingering concerns that manufacturers may have."

### Live robot demonstrations

Each afternoon will be given over to live demonstrations and training, with more than 25 leading robotics and system integrator companies including Rockwell Automation, Mazak, Mitutoyo, Bauomat, Mills CNC,



Mollart, Nikken and Robopod exhibiting at the Open House event, showcasing their knowledge, expertise and latest innovations.

Demonstrations of key FANUC systems, such as the CRX cobot range and the ROBOSHOT plastic injection moulding machine, will also take place each day and visitors can even watch a replica World Cup

trophy being made by the ROBODRILL vertical machining centre.

### Training and education

With education at the heart of the event, FANUC Academy taster sessions will also be available for visitors to enjoy, delivering free hands-on robot training. In addition, the Open House will offer visitors the chance to

pit their skills against this and previous years' finalists of the WorldSkills UK for industrial robotics. A partnership between employers, education and governments, WorldSkills uses international best practice to raise standards in apprenticeships and technical education to benefit both young people and employers.

Tom Bouchier says: "As a proud global industry partner of WorldSkills, FANUC has jointly promoted the competition to budding young robot developers. Visitors to our Open House can see if they have what it takes to enter the next cycle by carrying out the exact robotics programming task that was set for the qualifying round, and our superb young finalists will be on hand to offer their support. We look forward to showcasing the benefits of investing in the next generation and celebrating all the entrants' hard work this November."

To register your interest in attending the FANUC Annual Open House go to <https://ukopenhouse.fanuc.eu>

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## ABB launches 5-axis Delta robot

ABB is expanding its FlexPicker® Delta robot portfolio with the IRB 365. With 5-axis and 1.5 kg payload, the IRB 365 is both flexible and the fastest in its class for reorientating packaged lightweight products such as cookies, chocolates, peppers, candies, small bottles and parcels.

Responding to the rise in E-commerce and growing demand for shelf ready

packaged goods, the IRB 365 has been developed for applications including food and beverage, pharmaceuticals and consumer goods, where production line speed and adaptability are essential.

"The IRB 365 can pick, reorientate and place 1 kg products at 90 picks per minute," says Roy Fraser, global product manager for ABB Robotics. "Our customers saw that the growth in online shopping was driving the demand for shelf ready packaged goods, so we developed a new Delta robot that would rise to the challenge. By handling more products per minute, the IRB 365 robot increases productivity, while saving time and energy to make production more efficient."

From product reorienting, top-loading and secondary packaging, to bottle handling, unscrambling, 3D picking, feeding and parcel sorting, the IRB 365 meets a wide variety of applications. Powered by the OmniCore™ C30 controller, the smallest Delta robot controller on the market, the system offers best-in-class motion control, built-in digital connectivity and 1,000+ additional software hardware functions



ready to meet future demands and requirements.

Using ABB's PickMaster® Twin software, the IRB 365 can be integrated into packaging lines in a matter of hours rather than days, using digital twin technology, which also reduces changeover times from hours to just minutes.

As the latest member of ABB's portfolio of robots for picking and packing, the IRB 365 can be paired with other robots including the IRB 390 to pick, handle and pack payloads weighing from a few grammes up to 15 kg.

**ABB Ltd**

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**<https://new.abb.com/products/robotics>**



# Guhring introduces new stainless-steel parting-off system

Guhring has now expanded its grooving and parting-off to include a new grade with a blade width of 3 mm for parting-off stainless steel materials. The System 222 expansion adds to the existing indexable inserts for steel materials. With two cutting edges and a length of 22 mm, the new indexable insert is ideally suited for parting off the most common bar diameters.

The enhanced series also offers an extensive range of clamping holders with and without an internal coolant facility. As many production facilities use a mixture of steel and stainless steel materials, there has been an increase in the demand for stainless steel in particular. This has been created by elevated demand in the medical technology, automotive and general mechanical engineering sectors where machinists continually encounter stainless steel and other difficult-to-machine materials.

With this rise in demand and following the successful launch of the 3 mm indexable insert for steel machining, Guhring has now developed an insert for stainless steel machining. In series production, this new indexable insert is perfect for parting-off operations on turning centres with a barfeed system. As parting-off is frequently the last application in a machining cycle, process reliability during parting-off is critical. If the

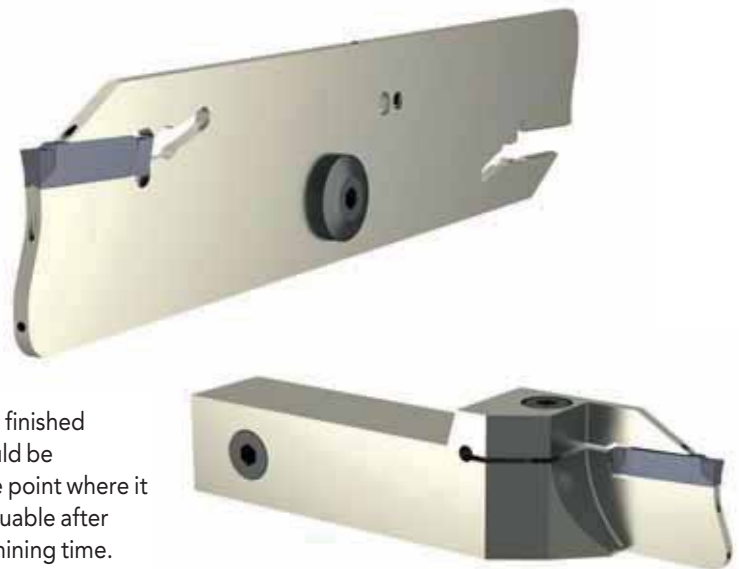


tool breaks, the finished component could be damaged at the point where it is at its most valuable after significant machining time. This is why it is important to use an insert with geometry, material composition and coating that have all been specially optimised for this application.

The experts at Guhring placed a major emphasis upon the interplay between chip breaker, carbide grade, coating and the design of the cutting edge and the results are astounding. During the development of the new stainless steel insert, Guhring experts advanced the chip-breaking technology considerably. The result is an insert with an extremely effective chip breaker. "Process reliability equals chip breaking and chip breaking equals process reliability," explains Marco Bücheler, product manager for grooving tools at Guhring.

With grooving and parting-off, a chip breaker has to work hard. It constricts the chip movement as the chip has to be narrower than the groove width and it makes the chip roll up to a compact formation and finally, it breaks the chip. When all three elements are achieved, the result is reliable chip removal and a high surface finish quality.

For safe and effective swarf removal, a targeted coolant supply is also recommended. This reduces temperatures during machining and minimises insert wear while underpinning the aim of improving surface finishes. The System 222 toolholders have a through coolant system for direct



fluid supply to the cutting surface. To simplify ease-of-use for operators and reduce setups, the connection for the internal cooling is tubeless. The perfect combination of the insert geometry, material composition and coating is the result of considerable testing by the experts at Guhring. A pre-series of tools were then produced and tested in the field by Guhring customers. The customer feedback was consistently positive with a performance level far exceeding that of competitors' tools.

In just one example, the feed rate was increased from 0.06 to 0.08 mm, which resulted in an impressive reduction in machining time with the same cutting speed. With a series run of 15,000 components, this customer made a time saving of more than five hours. Despite the higher feed rate, the Guhring created 40 percent more parts per insert edge with a 25 percent productivity gain. Marco Bücheler concludes: "We have a technically flawless product. Our field tests have shown that we perform well and are competitive with this insert in a wide range of stainless steel materials."

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## DVAS solid carbide mini drills

### Five technologies bring a new industry standard

Conventional deep hole drilling, especially when producing small diameter holes, is usually a slow and unreliable process. The special purpose DVAS mini drills have been designed from the outset specifically for drilling small holes in a wide range of materials.

The DVAS series is a total small drilling solution package. It has a vast range of lengths ranging from L/D=2 up to 50 L/D and a dedicated set of short pilot drills that start at Ø1.0 mm and are available in 0.1 mm diameter with increments up to Ø2.9. This means that the pilot drill sizes match the sizes of the longer length drills and thus ensures complete compatibility across the whole drilling process.

#### Substrate

Starting with the important base material, a brand-new micro-grain cemented carbide PVD coated grade called DP1120 was developed. The new multi-layer coating has an ultra smooth surface that prevents chip clogging and reduces the instances of breakage commonly found when drilling small diameter deep holes. Additionally, the excellent crater wear resistance helps to maintain cutting edge sharpness that reduces cutting force and also provides long tool life.

#### Through coolant holes

The Tri-cooling technology is optimal for small diameter drills and can achieve more than double the conventional coolant discharge volume. This dramatically improves chip discharge and heat dissipation and contributes greatly to tool life and stability.

#### Cutting edge design

The straight cutting edge and thinned point are connected by a smooth curved geometry that significantly improves fracture resistance. The geometry of the rake angle and land also improves tool wear and chip disposal.

#### New XR point thinning

This reduces cutting load and optimises chip flow. The new point thinning breaks chips into the optimum shape for a streamlined flow and achieves a much lower cutting resistance.

#### Unique flute form for greater rigidity

The neck is designed for high rigidity and good chip evacuation by tapering the flute instead of having a conventional shoulder. A chip discharge area, provided over the tapered flute section, increases tool rigidity by 20 percent more than conventional models. Additionally, the extra strength improves hole position accuracy.

#### Availability

Suitable for drilling aluminium alloy, steels, stainless, ductile cast irons as well as titanium, heat resistant and cobalt chrome alloys. The Stub drill series ranges from Ø1.0 ~ Ø2.9 mm in 0.1 mm increments. Regular to extra-long drills are available from Ø1.0 mm ~ Ø2.9 mm in L/D 7 ~ L/D 40 with the diameters 1, 1.5, 2.0 and 2.5 and also have an L/D50 type as standard.



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# 111k holes with WIDIA drills is no problem for precision toolmaker

As a company that specialises in press tooling and subcontract machining, the throughput of work at Cube Precision Engineering can be as diverse as it is challenging. When the Rowley Regis-based subcontract manufacturer was tasked with drilling 55,600 holes in a 3 m by 2 m press tool recently, it turned to the cutting tool experts from Industrial Tooling Corporation (ITC) and its industry-leading drilling lines.

The Black Country manufacturer produces anything from small to large volume batches



as well as bespoke tooling, stamping dies and more from an equally wide range of materials. To ensure the 37-employee toolmaking business can facilitate the production of large tooling projects, the company has a large bed Hurco DCX32i machining centre with a 3.2 m by 2.1 m bed. It is the perfect work envelope to accommodate the latest press tool that demands drilling over 55,000 holes in one

25 mm thick plate and also a second 50 mm thick EN8 steel plate.

With 13 CNC machining centres on the shop floor and a range of additional machining technology, the West Midlands company that works in the aerospace and automotive industries among others has witnessed a significant upturn in business since the pandemic. Discussing this, Cube Precision Tools managing director, Neil Clifton says: "The pandemic was a difficult time for most businesses in the manufacturing sector, but we were proud to retain all of our highly skilled staff and exit the period with a strong forward order book. Our expertise in the toolmaking arena has now seen our business win significant levels of new business from both existing and new customers. One new customer is a ceiling tile manufacturer and it was the recent design and production of a press tool for ceiling tiles that required the support of ITC."

The press tool for ceiling tiles for offices is an onshoring project with the work being brought from the US to the UK, a factor that brought another challenge with Cube Precision having to work to imperial drawings and dimensions. The 3 by 2 m press tool that can press 6 tiles simultaneously has one punch plate accommodating 55,000 pins and a corresponding base plate for the pins to enter after punching through the ceiling tile material. The company needed to drill a colossal 111,000 holes.

With the daunting prospect of drilling 111,000 holes, Cube Precision turned to its long-term tooling supplier for a solution. The West Midlands company has worked closely with ITC for more than seven years and now has a complete consignment stock



of cutting tools from the cutting tool manufacturer. Despite having an ITC vending machine with consignment stock of upwards of 60 different product lines that includes everything from end mills, taps, drills, indexable inserts, thread mills and more, the challenge of 111,000 holes in EN8 steel plate required something different.

Neil Clifton continues: "With a completely new press tool, we involved Simon Yeomans from ITC right from the start. Drilling such a large quantity of holes is a significant undertaking and estimation errors on cycle times and tooling costs can be the difference between a profitable project and a loss to the business. Fortunately, we have complete trust in Simon, the ITC products and the service he provides. He is more like a consultant, providing valuable advice and recommendations to support our machinists on the shop floor."

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holes being drilled had to meet tolerances of +/-1thou, 0.025 mm, to ensure the punching pins would locate in the base plate. The project required a solution that was the epitome of precision, concentricity and runout. The first step for Simon Yeomans, the ITC application engineer tasked to find a solution, was to enhance the working environment and particularly the concentricity and run-out of the tools. Luckily for Cube Precision, its preferred cutting tool partner is also the UK's primary BIG KAISER solution provider.

Prior to trialling any drill, the ITC expert set about improving the toolholding environment for the subsequent drill by maximising process stability. This involved the installation of the BIG KAISER New Baby Chuck NBS13, an extremely high-precision through coolant collet chuck that demonstrates unparalleled accuracy, stability and run-out to within just a few microns.

With the drilling environment optimised, the next step was to select the optimal drill. The challenge for the ITC engineer was to introduce a drill with an effective chipbreaker to break the swarf of the medium tensile and strong steel that inherently creates chipping challenges especially when tasked with drilling 111,000 holes. Drilling the 1/8inch, 3.175 mm, holes, ITC's Simon Yeomans trialled one or two drills with different cutting data. However, it was the performance of the ITC Widia VDS403 drills that stood out. The solid carbide 8XD 30 degree helix drill with through coolant facility performed like a dream, evacuating the swarf with ease.

On this challenging project, the VDS403 drill from ITC processed more than 1,200 holes before swarf control proved difficult, a sign that the drill needed re-sharpening. Thankfully for the West Midlands manufacturer, as a fellow UK manufacturer, ITC has the facility to re-grind cutting tools to reduce tooling costs and waste for customers.



Neil Clifton concludes: "As always, Simon from ITC has been at our side throughout this project, supporting our engineers with the right solution for the job. The ITC Widia drills have performed impeccably and we are delighted with the results. The speed, precision, concentricity and surface finish within the holes has enabled us to comfortably meet our deadlines and exceed the customers' quality expectations. Furthermore, the tool life has been extremely impressive and this has contributed to reducing our costs on the project."

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# CERATIZIT CBN insert proves decisive at hydropower specialist Gilbert Gilkes & Gordon

Gilbert Gilkes & Gordon (Gilkes) is a leader in the design and manufacture of hydropower turbines and pumps, with a 169-year history, exports to over 85 countries and proudly the recipient of a Royal Warrant for the supply of water turbines. Expansion, through organic growth and acquisitions has seen the business develop, supplying pumps to the marine, rail and automotive sectors and hydropower turbine systems installed as far afield as Alaska and Australia.

The company was created in 1853 to manufacture agricultural equipment, under the name of Williamson Brothers, but even in these early days, hydro-electricity was part of the company's agenda with the first order for a turbine being registered in 1865. It was in 1881 that Dublin born businessman Gilbert Gilkes purchased the company and a prestigious customer at that time, Lord Armstrong installed a water turbine at his home Craggside. It was the first house to have electric lighting. Product development has continued from that day until now with the result being a diverse range of turbines and pumps.

Many of its products harness the natural power of water flowing in rivers, described as run of river systems. Of course, systems such as this are also subject to the vagaries of the weather and the natural abrasion caused by river sediments. "Wear has always been an issue given the application, so we are constantly looking at new, more exotic materials, to help reduce wear and to extend operating time for our products. Most recently we have utilised tungsten carbide coatings on the runner systems within our turbines. This development



posed challenges to our in-house production team who worked closely with CERATIZIT, our tooling supplier, to achieve the desired result," says Derek Thomas, Gilkes' production engineering manager.

The part in question was a 600 mm diameter F35 Super Duplex ring that was subject to abrasion from sediment. To overcome this, Gilkes added a tungsten carbide coating, the application of which caused out of roundness which then had to be machined away. The challenge was how to remove this excess material. It was at this point we were chatting with Matthew Darbyshire from CERATIZIT and he suggested a new insert grade that would allow us to turn the part on the Mazak."

The insert in question was a brand new CBN grade CTBH 40U, which had been developed for turning hardened materials especially where intermittent cutting was an

issue. Two inserts were ordered and delivered the next day and, with cutting data of 210 m/min surface speed and 0.12 mm/rev feed rate with a .25 mm depth of cut suggested by Matt Darbyshire, it was put to the test. "The result was superb, just one insert was needed to complete the machining operation and the surface finish generated was

excellent. The insert cut the tungsten carbide coating like a dream," says production engineer Justine Marshall.

The suggestion of the CBN CTBH 40U insert is typical of the support offered to customers by CERATIZIT UK & Ireland's time-served technical sales engineers and applications engineering teams, who can call on over 100,000 products in the standard catalogue to solve specific problems. Matt Darbyshire visits Gilkes on a fortnightly basis to discuss any upcoming requirements, as well as servicing the two CERATIZIT tool vending machines on-site. One of these vendors is the latest TOM 840 unit capable of storing up to 840 individual items with monitoring and reordering done remotely by CERATIZIT. This unit is used to stock regular consumable cutting tools, such as inserts and drills. While the second vendor is an older TOM 60 system, which Gilkes maintains for tooling such as special taps and regrinds. The use of this older system, with its glass front, is due to the preference of Gilkes' operators who want to physically see stock levels of these lesser used, but vital tools.

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# Valve mating surfaces milled to Ra 12 nanometres using diamond tooling

Walter Schumacher and his son Stefan run the German company Walter Schumacher Impuls Technik GmbH (SIT), which specialises in the development and production of special valves and stand-alone valve solutions. The product range includes valves for all types of media ranging from high-vacuum valves to high-pressure valves rated up to 800 bar.

One special solution made from aluminium consists of several helium valves, various sensors, pressure relief valves and throttles. To achieve the required functionality for the application, the quality of the mating surfaces has to be between Ra 0.012 and 0.014 microns, 12 to 14 nanometres, to ensure an effective seal. It is being achieved without the need for polishing using a Mazak turn-mill centre with a bespoke workholding attachment and employing a diamond tool from Horn.

Walter Schumacher comments: "Sealing hydraulic valves that are subjected to oil pressures of around 450 bar is relatively simple. However, valves for controlling the flow of helium or other gases have to tolerate pressures up to 800 bar and manufacturing them is technically a very difficult challenge that not many people want to take on."

Before transitioning to the new production process, SIT relied on a specially developed polishing procedure to finish the valve blocks after machining. However, the time and labour entailed encouraged the



manufacturer to optimise machining of the valve surfaces. After a move to new company headquarters in Bretzfeld, investment in a new turn-mill centre had reached the planning stage but the machine builder was yet to be chosen.

Stefan Schumacher says: "We approached a few potential suppliers with our requirements. Mazak immediately expressed a high level of interest and proposed a complete valve block machining solution based on an INTEGREX i-200ST."

He said that the machine is rigid and stable and the spindle runs smoothly, with low vibration.

Once the machine concept had been decided, the next step was planning the tooling. Horn product manager Jürgen Schmid explains: "After initial contact had been made and the machining task outlined, it quickly became clear to me that the finishing process should be performed using our DTM milling system."

An alternative tool manufacturer was also considered. However, Horn was successful in achieving the required result on the first attempt, while the other manufacturer needed three tries. Walter Schumacher adds: "This made our choice clear, not only because we were immediately satisfied with the result, but also because of how impressed we were by the tooling company's expertise. We use other tool systems as well from Horn's Tübingen factory and are very happy with them."

The tool is a 125 mm diameter



face mill with six insert pockets but only two cutting edges. A polycrystalline diamond-tipped pre-cutting insert achieves a defined allowance of 0.02 mm, while a monocrystalline diamond-tipped insert mounted opposite it in the cutter body finishes the surface. Carbide balancing inserts occupy the four other seats but are not involved in the machining.

The tool is finely balanced at Horn to ensure it runs without vibration. The inserts in the DTM body can be finely positioned in the axial direction via an adjusting screw. Every 10-degree rotation moves the insert by 0.01 mm. It means that the axial run-out of the individual cutting edges can be adjusted with high precision.

Jürgen Schmid explains: "One difficulty was the large number of holes pre-drilled into the surface to be milled. Necessarily, high-polish milling must be the final machining operation, as otherwise very fine chips from drilling, reaming and thread milling would damage the reflective mirror surface. Even fingerprints can render the sealing surface unusable."

The interrupted cut across the drilled holes posed no problem for the Horn tool. During processing, the milling cutter moves once longitudinally over the workpiece at a rotational speed (N) of 5,000 rpm and with a feed rate (Vf) of 500 mm/min. Cutting speed (Vc) is 1,960 m/min. To reduce re-cutting of chips, the tool is set at a minimum lead angle of 0.008 degree. A commercially available emulsion is used for the coolant.

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# BlockPack - the ultimate packaging tube

The BlockPack from rose plastic is the safest square protection packaging tube. BlockPack is a diverse telescopic tube style packaging that can be used to pack and protect practically anything. Thanks to its length adjustment mechanism and special TwistLock closure technology, the BlockPack is easy to handle and can be adjusted to the desired product length in seconds and securely closed. The special base contours and reinforcing grooves ensure maximum product protection, while optional hangers and end caps made from ABS offer extra flexibility and safety.

rose plastic UK serves corporate customers throughout United Kingdom and Ireland. Its packaging experts will work with customers to provide the optimal packing solution to suit their products. With a comprehensive product portfolio, it sells plastic packaging for a wide variety of applications. Its packaging experts will advise in detail and work to develop packaging solutions that are precisely

tailored to individual products. Customers have the choice between packaging from a standard portfolio of around 4,000 products. Alternatively, they can opt for a customised packaging solution that is designed, developed and produced especially for them.

Environmental protection and the responsible use of raw materials; for rose plastic these are not just catchwords in the current discussion about sustainability, but rather convictions that have always been lived out. As a family-run company, rose plastic feels a special obligation to future generations and is intensively committed to ecological sustainability.

The company has been certified according to the environmental management system ISO 14001 since 2011. It is also a member of the Environmental Pact of Bavaria, Umweltpakt Bayern, and tries to avoid unnecessary environmental pollution in all areas. For example, it uses waste heat from production to heat its office



building and it uses environmentally-friendly processes and technologies for the production of its packaging. Its aim is to use resources such as energy or raw materials effectively.

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# Parting off and grooving

How to increase productivity by 400 percent - "He who parts off wins."

Parting off and grooving are among the most important, but also most demanding turning operations. There are many parameters that determine the result and productivity of the process and production. In addition to the rigidity of the machine, feed rate and cutting speed, the parting-off and grooving tool and its holder are decisive factors governing the quality and efficiency of the grooving operation and workpiece. If you ignore the diversity of cutting materials, blades and holders, it will quickly become very costly. Innovative manufacturers with a customer-oriented mindset and application expertise are important advisers.

Parting off is like many other important manufacturing processes: the devil is in the detail. There is so much to be considered in this important turning operation. After all, it plays a decisive role at the end of the turning process, i.e. when a lot of added value has already been invested in the workpiece. In addition to feed rate and cutting speed, groove width and cutting depth, chip evacuation is one of the factors that requires particular attention. Finally, the right tool and its holder determine the quality of the components and process efficiency.

### Diversity of variants reflects application experience

Anyone who underestimates the complexity of grooving and only uses individual parameters for their decisions will quickly pay dearly. By the way, this also applies to parting off and profile grooving. Suppliers with application experience, consultancy expertise and fast-response service can boost processes and productivity. Increases of 400 percent are achievable.

Karl-Heinz Arnold GmbH in Ostfildern near Stuttgart has made a name for itself as a tool manufacturer with considerable application experience and consultancy expertise. The family-owned company known as ARNO Werkzeuge offers innovative parting-off and grooving systems with a diversity that reflects the company's vast experience. The double-edged SA grooving system with groove widths of 1.5-10 mm is suitable for parting off and grooving at cutting depths of up to 140 mm in diameter. Together with many modules,



holders and blades, the parting-off tool is always optimally adapted to the situation. In addition, the manufacturer offers a wide range of machine-related flange mounted holders for many machine brands.

Stability and low vibrations for best results. Users can choose from six geometries, seven coatings and two solid carbide substrates to achieve the best possible cut on various materials. The SA grooving system is adapted to steel, stainless steel, aluminium or materials that are difficult to machine. It has been tried and tested for years and ensures an uninterrupted cut for applications that require optimum chip breaking geometry, thanks to its negative chamfer geometry.

For grooving applications and Swiss type machining, the manufacturer recommends the flexible solution of its SE groove turning system. As it is highly stable, it achieves perfect results despite high lateral forces. The SE system allows users to part off even if workpieces have a large radius.

The manufacturer has developed a third tool especially for parting off small components with small diameters. The three-edged ATS system can be used by turning operators for a wide range of short, precise grooves. Here, the manufacturer focuses on proven substrates and coatings. A countersunk clamping screw clamps the tool rigidly and precisely to the ground

contact surface. ATS offers a large cutting depth of 6.5 mm compared to its compact dimensions. Groove widths start at a very narrow 0.8 mm and extend to 6 mm. When it comes to profile grooving inserts, contours up to 20 mm long can be mirrored on one insert. Since the system is so compact, users also use the ATS system for applications in shoulder grooving or in Swiss type machining.

### Think about the processes, not just the products

If a tool manufacturer is a serious supplier and does not merely want to sell products to its customers, he will also find custom and application solutions to improve processes and increase productivity. In our example, the manufacturer ARNO Werkzeuge presents innovative products that demonstrate precisely this philosophy. For example, customers are delighted with the AWL/AFC quick-change tooling system. Two-part carrier tools make for quick tool changes that even unskilled personnel can easily perform safely.

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# Combining compliance with productivity

## Automating the UDI laser marking process

In order to comply with UDI regulations, a permanent UDI code must be applied to a wide range of medical devices, surgical instruments and implants. Laser marking has become the prime technology for these marking applications, due to the ability of the laser to mark a diverse selection of materials and the consistent high quality associated with the process.

With ever increasing numbers of items requiring compliance marking, manufacturers are seeking to automate the process wherever possible. Where products are being manufactured within a production line environment, the laser marking system can be incorporated as an integral part of the line. However, for other applications, where there may be a high product mix, or where the marking operation is carried out offline, a more flexible solution is required if the process is to be automated.

This article looks at combining robotics with the laser marking process to achieve flexibility within a UDI compliance marking environment.

The concept of robot machine loading is already well established within high volume manufacturing processes, such as those associated with the automotive sector. These systems ensure high levels of productivity while delivering the quality and consistency required by the sector.

The principles and objectives of using the same robotic systems, but combined with laser marking technology, as opposed to



CNC Machine Tools, are exactly the same. With the robot tasked with part handling, transfer, loading and unloading, consistent cycle times will be achieved, guaranteeing the highest levels of productivity. In addition, any parts deemed reject by the laser marking system will be reliably segregated from the good parts, ensuring 100 percent quality.

TLM Laser's Andy Toms says: "Our laser marking technology partner FOBA Laser have demonstrated the benefits of automating the laser marking process through a collaboration with Add'n Solutions, a German laser marking service provider and Fruitcore Robotics. The company was looking for an automatic loading system for its M2000-P laser marking machine, which is used to mark surgical instruments. The primary challenge was the large variety of parts to be marked in small to medium batch sizes. This meant that the system would need to be highly flexible,

while eliminating lengthy setup times or modifications to the robot gripper. In addition, the system had to be interfaced to the marking workstation and fully integrated into the process with corresponding process documentation and subsequent machine validation."

The solution to handling the large variety of parts to be marked, lies in the concept of transferring the surgical instruments on trays to FOBA's M2000-P, as opposed to individually. This eliminates the need for gripper changes or modifications between product or batch variants. With the special tray gripper concept developed, FOBA was then involved in setting up the interface to the M-Series and its integration into the marking cell.

A safety enclosure with two access points, a service door and hatch for loading, was designed and the processing procedure defined:

- Instruments are placed on a tray and loaded to a service trolley.
- The 6-axis robot takes a tray from the trolley and loads the M2000-P.
- Within the laser marking station, all parts are checked automatically for part integrity and position.
- The marking content is automatically



aligned relative to the part position on the tray and the instruments are marked exactly at the position required.

- The robot then removes the tray with the marked parts and places it back in its original slot in the service trolley.

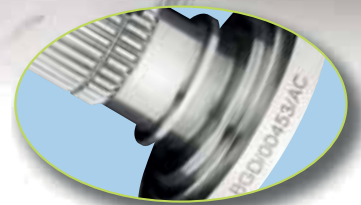
Andy Toms concludes: "This system demonstrates how innovative thinking, combined with latest generation technologies, can deliver a series of benefits for the end user. Once primed with the service trolley and trays, this cell will run



unmanned ensuring that all parts are not only checked prior to marking, but that the marks are validated post marking before the parts are removed from the cell. The concept of having parts placed in a tray makes it possible for the cell to process multiple part types in small or medium batch sizes."

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# How to choose a laser source for industrial marking?

Each laser source has its own advantages and meets a specific need. Laser marking is very popular in many industries. However, there are several types of laser sources for different uses and different materials to mark. What differentiates all these laser technologies is, above all, the wavelengths. They are positioned in the invisible spectrum of the ultraviolet and infra-red, or in the visible spectrum between the first two. Depending on their position, laser sources can or cannot mark certain materials. The fibre laser is the most common laser marker on the market. Like the CO<sub>2</sub> laser, its wavelength is located in the infrared spectrum, but this one is at the limit of the visible spectrum, 1.064 µm.

It is greatly used in the sectors of metallurgy, automotive, aeronautics and more generally in the mechanical industry. It is the laser to choose for the realisation of markings on all types of metals.

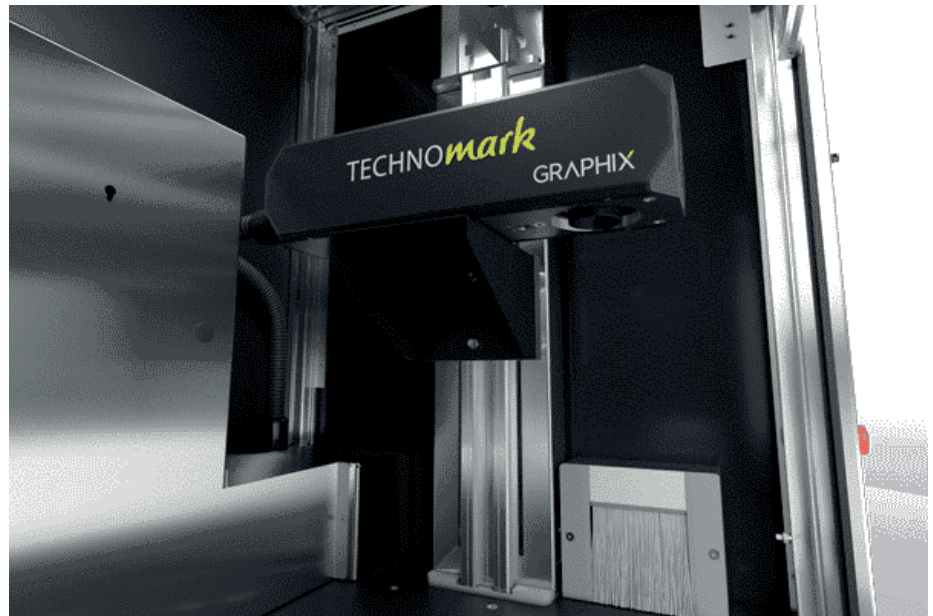
### Why choose a fibre laser?

It is an ultra-reliable laser source with a very high lifetime; it can make very deep markings depending on the power of the laser; The parameter setting enables easy adjustment of the marking result and it requires very little maintenance. Marking is carried out very quickly and it is possible to carry out markings with relief or a discoloration on the part.

### Markings on organic materials using the CO<sub>2</sub> laser source

The CO<sub>2</sub> laser source has the longest wavelength 10,600 µm, and is located in the invisible infrared spectrum. The specificity of this laser is that it works with electrically excited carbon dioxide. This provides a fairly good performance but requires, however, more maintenance.

The CO<sub>2</sub> laser is ideal if you want to mark organic materials such as wood, plastic, glass, textile and cardboard. This laser technology burns and melts the material in contact with the surface to be marked thanks to the CO<sub>2</sub>. It is, however, one of the most energy consuming laser sources up to 70 kW. It has a high marking speed, can be used on organic materials and it can also cut certain materials



### YAG laser markings or "crystal" laser for sensitive materials

The YAG laser is ideal for marking plastics. Its wavelength is similar to that of the fibre laser, 1.064 µm, however its structure is totally different. The YAG laser is powered by a neodymium doped diode, then the beam passes through different crystals. This laser structure allows it to perform markings on different materials, even the most sensitive and/or risky ones. In its "classic" configuration, the YAG laser is perfectly suited for marking metals and plastics.

The fact that crystals have been implanted in the YAG laser structure has made it possible to play with the wavelength of the laser source. Two new solutions were then developed:

### The green laser designed for sensitive polymers

The green laser is the only laser solution that positions its wavelength in the visible spectrum 532 µm. This short wavelength offers the possibility to mark many sensitive materials which are very often plastics and polymers. Other laser solutions have a lot of difficulties to mark flexible materials, such as rubber for example, because it is a very fragile material which reacts very badly to heat. It is important to know that the closer the wavelength is to the infrared, the more heat the laser generates. On the other hand,



the laser will give off less heat if it is positioned near the ultraviolet.

### Ultraviolet laser marking for cold marking

The UV laser source has the particularity of being the only laser marking technology in the invisible ultraviolet spectrum. It has the shortest wavelength used in the field of laser marking, 0.355 µm, thanks to the use of additional crystals.

This laser source is used by companies who wish to carry out markings on rather sensitive parts. Indeed, the UV laser can carry out cold markings which avoids any degradation of the part due to heat. It can be used, for example, for marking electronic components and solar panels.

The choice of the source is an essential element for the realisation of your future markings.

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## New XXL-Box laser marking enclosure from SIC Marking UK

"After the huge success of the L-BOX and XL-BOX, our compact marking stations, we have been asked on numerous occasions to offer a larger workspace in order to be able to mark large parts." These are the words of SIC Marking on the launch of its new XXL-BOX Laser Marking Station.

Available in three basic sizes at a very competitive price, the XXL-BOX perfectly complements SIC Marking's laser workstation wide range of products, which makes it possible to meet all customer requirements in terms of cabinet size.

As its name indicates, the new XXL-BOX station offers record working dimensions, up to 520 mm high, as well as great modularity thanks to its three standard models, 800, 1,200 and 1,600 mm wide and its numerous accessories. The strength of this new product also lies in its ability to adapt perfectly to different customer requirements, illustrating the company's extensive know-how in the realisation of tailor-made solutions:

"The XXL-BOX is ideally suited for the classic use of its large working volume, but also enables project managers at SIC



MARKING to offer tailor-made solutions for more complex large-volume marking applications. Automatic three-dimensional axis, automatic loading system, loading drawer or turntable are just a few examples of the applications proposed by technical teams to meet customers' needs."

Requested by a large number of customers, the new XXL-Box Laser Marking Station has been well received by ETIs and large companies manufacturing large parts or sub-assemblies such as shafts, valve or

pump bodies, crankcase, exhaust components but also bodywork sub-assemblies. It is not surprising to find it in the sectors in which SIC Marking is already active including automotive, aeronautics, industrial vehicles, hydraulics, oil & gas.

As a result, the international French group had the opportunity to prove all the qualities of its new product by taking up the challenge offered by ZF, a major German automotive supplier. The company wanted to mark a Datamatrix code on gearbox prototypes. The solution provided was an XXL-BOX laser marking station, with a 5-axis laser that made it possible to achieve a marking window of 900 x 500 x 500 mm. The project was the result of a technical and commercial cooperation between the headquarters and SIC MARKING GMBH which demonstrates the great adaptability of this new product to customised requests.

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# Quality marking at an affordable price

The versatility and low cost of electrochemical marking technology make it the ideal technology for applying high quality marks for traceability or identification of a wide range of different metal components whatever their size, shape, thickness or hardness.

UMS manufactures electrochemical marking systems in the UK that deliver high contrast permanent marks which are virtually stress free. Marking is fast with most marks being produced in 1-4 seconds. Mark on any conductive metal surface including stainless steel, carbon steels, mild steel, titanium, Inconel and below surface etched marks on metals such as aluminium and brass. Electrochemical can also mark thin wall section that can be distorted by the heat of laser marking and the impact of dot peen.

Its stencil software enables you to produce stencils that can mark the new UKCA symbol, datamatrix, incremental serial numbering, date/timestamp, logos, symbols and graphics, text on an arc. Users can also use a barcode reader for data entry to reduce setup time and operator error. The marking kits are portable to be used wherever they are needed.

Users can design their own layouts including nameplate layouts with logos, symbols and boxes which can be saved as a template. Retrieve the file when needed and add the variable data before printing the stencil and marking. The generous sized 105 mm wide thermal stencil paper allows



production of large nameplates if needed. If sequential numbering, the thermal stencil printer has a partial cut facility allowing a batch of numbers to be printed in a strip, separated by a small tab, so they stay in order but are easy to separate for marking.

A wide range of accessories include a reservoir assembly for the range of carbon marking electrodes. The reservoir holds the electrolyte making the dosing of electrolyte clean, easy and fast to apply the marks. With in-house 3D CAD capability and also a 3D printer, Universal Marking Systems can make low cost jigs and fixtures to make the marking cycle even faster.



Its electrochemical marking systems are aerospace and nuclear industry compliant and its high purity aerospace and nuclear grade electrolytes are independently lab tested to ensure they comply with the most stringent standards.

Within the food industry it is widely used by food processing equipment manufacturers and also within the processing plants, for traceability of a wide range of items used in the production of food, drink and pharmaceutical products.

Electrochemical marking is used widely across industry including aerospace, automotive, nuclear, tooling, food processing and medical where the electrolyte has been cytotoxicity tested and deemed safe for surgical items and implants. As the company manufactures all items on site, most items are ex stock and can be offered with fast lead times.



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# FOBA presented a full scope of laser marking at IMTS

FOBA attended the International Manufacturing Technology Show IMTS in Chicago last month, where it presented three laser marking systems on site and two sample marking giveaways.

Two M-series marking systems, FOBA M1000 and M2000 and FOBA Titus, a laser marking head for line integration especially in restricted spaces, were available for laser marking live demonstrations. With various functionalities and integrated camera, each laser system offers advantages and can be selected according to the application requirements and the specific metal or plastic substrate characteristics.



The exhibited M2000 laser marking workstation was equipped with FOBA Mosaic to demonstrate automated optical mark alignment on parts that are placed randomly in the marking field. Another M-series system on display at IMTS, a compact table-top M1000 workstation, was used with a rotary unit for circumferential marking on metal drinking straws. Visitors could take the straws home as trade show samples from FOBA.

Anodised coloured aluminium plates were another marking sample, used to demonstrate the Titus™ marking system. Titus is the smallest marking head on the market and enables high-speed inline processing in manufacturing lines that require much flexibility of integration. Apart from the minimum size of the marking head, it is the simplicity of mounting and a 3 or 10 m umbilical that contribute to the flexibility of Titus.

FOBA was represented at its booth by nearly all of the US sales engineers as well as international colleagues from product management, sales and applications. The team provided laser marking and engraving application advice for visitors from the medical, automotive, aerospace, machining and many other industries.

FOBA Laser Marking + Engraving, a brand of ALLTEC Angewandte Laserlicht Technologie GmbH, is one of the leading suppliers of advanced laser marking systems. FOBA develops and

manufactures marking lasers for integration as well as laser marking workstations with vision assisted marking workflows. FOBA technology is being applied for the direct part marking of any kind of metals, plastics, or other materials in industries like automotive, medical, electronics, plastics or tool, metal and mould making. With its worldwide sales and service branches and its headquarters near Lübeck/Hamburg, Germany, ALLTEC/FOBA is part of the Danaher Corporation.



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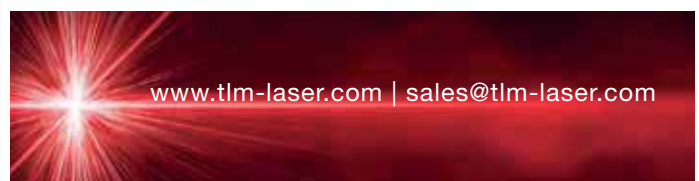


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# Mitutoyo provides 'all round' precision to Tenon Engineering

Tenon Engineering Ltd is a leading precision manufacturing company specialising in the integrated design and production of complex electromechanical assemblies. The Dorking-based business' in-house manufacturing resources include, multi-axis machining, cylindrical grinding, precision sheet metal fabrication and electromechanical assembly, alongside specialist coil winding and electrical motor manufacturing. Tenon's engineering resources cover mechanical, electronics and firmware design, production engineering and analytical reverse engineering.

The ISO 9001 certified company's services are underpinned by a robust quality management system, ensuring that high standards of quality, accuracy, efficiency and reliability are embedded into all of the business' activities. To support Tenon's company-wide quality philosophy and to aid its high-precision capabilities, the business provides its skilled quality control staff with a range of cutting-edge inspection equipment. An example of Tenon's willingness to invest in its important quality function is the company's recently purchased advanced Mitutoyo ROUNDTEST RA-2200 CNC instrument.

Having searched for a suitably accurate and efficient means of measuring roundness and cylindricity, an in-depth demonstration convinced the staff of Tenon Engineering that the innovative Mitutoyo instrument delivered both the required levels of precision and the ease and speed of use they were looking for.

Explaining the reason for the recent purchase, Tenon Engineering Ltd chief engineer, Terry Healy explains: "From concept to completion, Tenon Engineering provide high-quality, complex assemblies and precision components. We work internationally and up to 80 percent of our output is exported to major markets in the USA, Asia, Africa, and Europe. Our technically demanding customer base includes some of the world's leading suppliers of scientific equipment, including our sister company Wallace Instruments, a global leader in the quality assurance testing of rubber, plastics and other materials.

"Due to the nature of our customers, much of our output has challenging roundness and cylindricity measurement parameters. Having decided to further enhance our already high standards in this crucial area, we recently investigated the availability of the relevant, high-precision products. In addition to the accuracy of the proposed new equipment being vitally important, because of the continuous throughput of high-precision components in our busy quality department, the speed and ease-of-use of the chosen system were also major considerations.

"Having studied the available options, we concluded that a ROUNDTEST RA-2200 CNC was the best choice for our demanding precision and efficiency needs. As the advanced Mitutoyo roundness and cylindricity measurement instrument is so easy to use, following its trouble-free installation and training, our quality control staff quickly mastered its operation. Now, in addition to precisely measuring one-offs, we are able to load batches of components onto the instrument's table, recall previously written



part-programs and start rapid, CNC inspection routines. Once underway, the Mitutoyo instrument's ability to undertake fully automated inspection tasks allows its operator to undertake other duties.

"As traceability is a crucial element of our work, having inspected a batch of components, if required, Mitutoyo's easy to use software generates comprehensive inspection reports. In addition to the ROUNDTEST RA-2200 being able to achieve the high levels of precision that we require, its fast, CNC operation has reduced the possibility of bottlenecks in the areas of roundness and cylindricity inspection."

The ROUNDTEST RA-2200 CNC series of roundness and cylindricity measurement instruments, as purchased by Tenon Engineering, provide class leading levels of precision. A wide variety of models are available to suit the vast majority of applications and, despite their speed and ease-of-use, the advanced Mitutoyo instruments offer multifunction analysis capabilities. In addition, the instruments' rapid CNC operation, with fully motorised axes movement, allows highly-efficient, automated inspection tasks to be performed.

The accuracy and operational efficiency of the range is supported by the use of high-precision turntables that enable the simple and accurate centering and levelling of each workpiece. The turntables boast a high rotational accuracy specification of, radial -  $0.02+3.5H/10,000 \mu\text{m}$ , and axial -  $0.02+3.5X/10,000 \mu\text{m}$ , allowing the precision measurement of flatness, roundness / cylindricity and other characteristics. For centering and levelling support, operators are able to select Mitutoyo's A.A.T. (Automatic Adjustment Table) or D.A.T. (Digimatic Adjustment Table) options.



The ROUNDTTEST RA-2200's detector-unit holder is equipped with a sliding mechanism, allowing the one-touch measurement of components that feature deep bores with thick walls, previously a difficult inspection operation by the use of conventional arms. Furthermore, internal/external diameters can be easily measured by means of a continuous internal/external diameter measurement function.

Superior protection systems are incorporated into the ROUNDTTEST RA-2200 series. A collision sensing safety function has been added to the detector unit to prevent collisions in the Z-axis and, in addition, an accidental collision prevention function which stops the system when the detector unit displacement exceeds its range, has been included. Also, when an accidental touch is detected, Mitutoyo's ROUNDPAK software, senses the error and automatically stops the system.

ROUNDTTEST RA-2200 models use Mitutoyo's renowned ROUNDPAK analysis software. User-friendly ROUNDPAK provides simple operation by the use of a mouse and icons, enabling rapid, intuitive operation. A wide variety of inspection parameters, including those for roundness/cylindricity, as well as flatness and parallelism, can be selected by clicking on the appropriate icons. ROUNDPAK also features several specialised functions, such as design value best-fit analysis, harmonic analysis and a function for recording the peak or trough points on a circumference.

If required, users are able to adapt and ROUNDPAK's graphics and measuring results in a way that suits their individual needs. In addition, bespoke reports can be created in custom formats by



specifying how the analysis results should be displayed, as well as the sizes and positions of graphics.

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## Leading metrology companies find the solution to manual probe setup

Three key players in the world of precision metrology have collaborated to provide a solution that has been missing from the advanced manufacturing industry and is vital to maximising the accuracy of measurement on machine tools.

Metrology giant Renishaw and two of its associate companies MSP, based in the UK and RLS, based in Slovenia, have joined forces to resolve the last manual element of the CNC machining process: touch probe setup and calibration. Thanks to this innovative move, it is now possible for manufacturing companies to achieve full 5-axis machining automation.

AutoClock is a device protected under a joint MSP and Renishaw patent that automatically finds the position of a calibration artefact, usually a sphere, in the machine tool, as part of the on-machine probe setup process. AutoClock is the first product on the market capable of fully automating this procedure, allowing for automated machine tool probe setup and calibration to micron-accuracy in a 24/7 lights-out manufacturing environment.

The development of AutoClock started when MSP, whose existing software

products were already providing automation for CNC machine tool checking, part setup and on-machine inspection, recognised all methods for setting up a probe for 5-axis calibration were still manual. They knew that this manual setup could introduce errors into the CNC machining process and, ultimately, onto machined parts.

MSP has been an associate company of Renishaw since 2005 and provides development work for its CMM controller products, UCCserver and Equator™ gauging systems. After an initial research phase, MSP consulted Renishaw for guidance on how to automate machine tool probe setup.

Renishaw proposed using a LinACE™ In-Axis Linear Shaft Encoder developed by another of its associate companies, RLS. For over 15 years, RLS has worked with Renishaw, designing and manufacturing its magnetic rotary and linear encoders for industrial assembly systems, metalworking, and electronic chip production. The use of the LinACE encoder was the missing piece of the puzzle and proved to be the



breakthrough that was needed to get the product to where it is today.

Matjaz Sivec, senior product manager for LinACE encoders, states: "To see the pivotal role our LinACE encoder plays in an innovative device like this is fantastic. The development process also provided useful feedback about our products, enabling us to improve them for specific niches in the advanced manufacturing industry."

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# Business digitalisation for sheet metal manufacturers in five easy steps

Digital transformation can seem a daunting task for sheet metal manufacturers but, in reality, every company can go at the pace that suits it best, minimising the effort of implementing changes while maximising the benefits from each step. The five steps that Lantek offers are installed with little or no customisation so that they are operational 'out of the box' making it easy to get familiar with the software from each step before moving on to the next.

Manufacturers can stop at any step if they feel that is as far as they wish to go with digital transformation, giving them the flexibility to do what is best for their business while still having the option of continuing along the path at some time in the future.

### Step 1: Quotations

When preparing manual quotations, it is typically possible to produce about three to 10 quotes per day. With Lantek's quotation module you can produce as many as 100 per day depending on their complexity while at the same time achieving greater accuracy and consistency. Customers using this module report that there is a link between speed of quotation and the likelihood of an order.

With Lantek's quotation module CAD models and DXF files can be imported and, via links to the Lantek Expert CAD/CAM software, provide accurate cutting times and material consumption. It stores hourly rates for the machines, employees, non-CNC operations and subcontracted operations as well as material costs which can be updated as they change. Calculation formulas are part of the system so that the results are repeatable, predictable and accurate. The layout of the quotation is customised to suit your company style.

### Step 2: Sales Management module

This module controls the paper trail for each order, generating internal sales orders for each job, producing order acknowledgements, delivery notes and invoices.



Traceability is increasingly important for many manufacturers and the tools in this module provide a way of keeping track of each order, its manufacturing status and communicating with the customer in a professional and timely way while reducing administrative effort. This module also helps in keeping track of where business is coming from, which are the best customers and which customers are not accepting quotations. This information can help in optimising the sales process.

### Step 3: MES Manager

It is often difficult to find where parts are in the workshop and, depending on the customer mix, it is often important to bring together parts from many different orders onto one sheet of material. With MES Manager it is easy to release multiple sales orders to the workshop and nest multiple parts from different customers on one or more sheets of material. Tracking provides valuable information about the status of each job as it goes around the workshop together with data about manufacturing times for each operation. This data can be compared with the quotation to highlight any discrepancies. Gathering this information can be used to optimise the quoting process, identify manufacturing problems and to evaluate the efficiency of machines and other processes. Of course,

MES can operate in a paperless environment which is faster and more reliable with higher accuracy by using data capture. However, Lantek software allows these options to be added as and when it best suits the customer's business.

### Step 4: Inventory tracking

This provides information about the stock of material and remnants in the factory. It also tracks the material and its cost as it is purchased, automatically updating the material costs in the quotation module. It links to Lantek Expert making it easy to use remnants and material that is available during the nesting of a mix of different jobs. Full traceability makes it possible to see exactly which batch of material is used for each job.

### Step 5: Data capture

Implementing data capture will have a major impact on the ease and accuracy of the information collected from the workshop. Manual systems rely on conscientious use of paper-based reporting systems. Automated operator reporting takes away the need to fill in paper reports and produces results in real time, allowing any necessary corrective action to be taken immediately. There are several ways in which this can be done. For newer machinery the machine control can be connected so that as soon as the

operation starts and stops, the times are automatically recorded. Other options include barcode readers or tablet enabled verification. These options are ideal for secondary operations such as welding or painting. The key benefits are high accuracy for operation times and quality control data sent back to the system as it happens. It can also give an early warning should processes be going wrong. With more accurate information quotation accuracy will be higher, profitability of each job can be verified and changes to manufacturing processes made based on live data.

Training after sales support and integration with other systems are important factors in any investment decision. Lantek has mature products designed for sheet metal manufacture and, its experience in integrating with accounting systems and other ERP systems such as SAP is far reaching, as is its experience in special customisation requirements for more complex needs, for example, multi-plant operation, specialised KPI reporting and online ordering platforms.

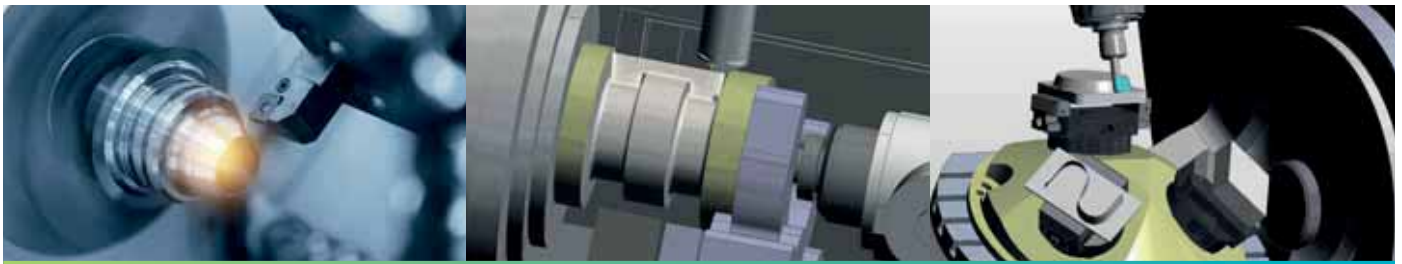
It has a worldwide support network and its commitment to an extensive software



development programme provides the user with confidence in the software supplied by Lantek now and for the future. The system is extremely intuitive so training concentrates on best practices to deliver the highest possible return on investment. With these five steps, which can be taken in almost any order and at any pace, every company in the

industry can start on the path to digital transformation.

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# 3D printing on the moon

## Giant Magellan telescope showcased at IMTS

### How do you build a new house on the moon?

With NASA's upcoming launch of the Artemis 1 Space Launch System rocket, America's attention is on space. To explore how manufacturing technologies enable sustainable lunar lodging, AMT's Emerging Technology Center (ETC) at IMTS featured a scaled section of the 23-foot-tall Rosenberg Space Habitat, the world's tallest 3D-printed polymer structure. The ETC also had live demonstrations of the robotic 3D printing technology used to make the space habitat, as well as video interviews with the designers and builders of the habitat.

The ETC, powered by AMT, The Association For Manufacturing Technology, which owns and produces IMTS, is renowned for showcasing projects and disruptive technologies and challenging preconceived notions of how manufacturing performs at its best.

It also featured the machine tools and other manufacturing technologies being used to create the 138-foot-tall Giant Magellan Telescope (GMT). The GMT will be four times more powerful than the James Webb Telescope and 10 times more powerful than the Hubble Telescope. IMTS exhibitors Ingersoll Machine Tools and Siemens Industry collaborated to produce the space habitat and Ingersoll is machining the telescope mounting system at its facilities in Rockford, Illinois.

"The public only sees the rocket launches or spectacular images of galaxies that push the boundary of science, but virtually every space or aerospace project involves components manufactured by IMTS attendees using technology from IMTS exhibitors," says Tim Shinbara, chief technology officer at AMT. "NASA understands that when your supply chain stretches 238,900 miles back to earth and beyond, automated AM systems make the most efficient use of precious cargo space and limited human resources. The lunar habitat and GMT are literal out-of-this-world examples of how digital technologies increase manufacturing efficiency."

"Even in light of our long history building massive structures for the Department of Defense, I am in awe of the Ingersoll team



collaborating with scientists who develop equipment and systems that enable us to explore the universe and work on the moon," says Jeffrey Ahlstrom, Ph.D., CEO of Ingersoll Machine Tools, part of the Camozzi Machine Tool Group. Ingersoll and sister company Innse-Bernardi have a rich tradition of manufacturing large, complex machines and machinery that require complex tolerances, as well as rigidity, precision and accuracy while moving.

The GMT stands 12 stories tall and weigh 2,100 metric tonnes. The altitude-azimuth mount provides the supporting framework for seven of the world's largest mirrors, each of which has a diameter of 27.6 feet. The mirrors are so perfect that if they were expanded to the size of the United States, the tallest imperfection would be two inches. It can track celestial targets moving across the sky with about 1 arcsec accuracy, 1 arcsec = 1/1,296,000 of a turn. The huge structure is too heavy to precisely position by mechanical means alone, the telescope

mount floats on an oil film 50 microns thick and it uses Heidenhain linear encoders for accuracy, the same type of encoders used to position CNC tools.

Ingersoll is fabricating the GMT mount at its new 40,000 sq ft manufacturing, assembly and testing centre in Rockford using one of its largest and most advanced MasterMill systems. MasterMill is the company's large-format, 5-axis, cross-rail-adjustable gantry system for complex-geometry hard metal components. The gantry has a total work envelope of 25 by 11 by 6.2 m. Even at that size, the mount is so large that Ingersoll needed to excavate a pit underneath the gantry to avoid violating local building height restrictions. The gantry also needs to be fabricated in two- and three-story segments because of transportation size restrictions on the roads to the Las Campanas Observatory in Chile, where Ingersoll technicians will assemble it with the mount when fabrication is complete in 2025.

The cornerstone of the robotic 3D system in the ETC is the Ingersoll MasterPrint Robotic, a large-volume hybrid system with the ability to seamlessly program, simulate, 3D print and mill composite parts in a single piece. It uses Camozzi digital 4.0 technology and the Ingersoll Composite Software Suite for additive and automated composites.

**The Association for Manufacturing Technology (AMT)**

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## Hexagon and VI-grade accelerate zero-prototype automotive engineering with high-fidelity vehicle simulators

Hexagon's Manufacturing Intelligence has announced that its Adams Real Time multibody dynamics simulation software has been validated for operation on VI-grade Driving Simulators, enabling carmakers and Tier 1 automotive suppliers to develop safe and desirable driver experiences efficiently and without physical prototyping.

The automotive industry is under constant pressure to address rapidly evolving market demands with resource-constrained engineering environments. Rapid product development timelines are compounded by shrinking physical prototype budgets that necessitate greater use of simulation.

Automotive engineers rely on Adams to build their virtual vehicle prototypes and its Adams Real Time Hardware-in-the-Loop (HIL) capabilities to bridge the gap with physical tests. The high-fidelity simulations they develop are used to evaluate their engineering decisions against ride, handling and durability targets to produce safe and comfortable cars.

A leading provider of driving simulator technology, VI-grade helps engineers



accelerate automotive innovation by enabling physical testing of Computer Aided Engineering (CAE) models, without the need to manufacture prototypes of systems or vehicles. Adams Real Time is now recognised by its VI-Certified program, that includes only those third-party solutions that pass stringent tests for real-time reliability and safety. Hexagon has drawn on its many years of collaboration with VI-grade to bring high-fidelity physics to VI-grade's experiential driving platforms, making it easier to reproduce on-road experiences in the manufacturer's test facilities where engineers and focus groups improve future vehicles.

There are significant returns on investment for companies using Adams. The

simulation models routinely created for vehicle dynamics and handling can now be used for the real-time testing and validation tasks performed on VI-grade simulators simply by applying Adams Real Time settings. Utilising a consistent, high-fidelity Adams vehicle model throughout the product development cycle delivers significant productivity gains.

Using Adams Real Time, users can now extend the use of their existing models directly into HIL or the Driver-in-the-Loop (DIL) testing and validation phases. Unlike other approaches, the topology and parametrics of the vehicle model are preserved when Adams Real Time is used in real-time applications, allowing engineers to explore different vehicle configurations and tune them seamlessly while enabling stakeholders in adjacent departments to collaborate more effectively.

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# Bandsaw cuts tool steel four times faster

Gloucester-based Avent Extrusion Steels stocks and cuts predominantly hot work and cold work tool steel grades used by its customers in a wide variety of industries to manufacture dies for extruding aluminium or copper. It is also a contract machinist of free-issue metals supplied by other customers. To upgrade and increase sawing capacity, in January 2022 the company invested in a new KASTOtec AC4 KPC programmable, horizontal bandsaw, which replaced an ageing machine from a different supplier.

The machine was installed following successful cutting trials in the Milton Keynes showroom of KASTO Ltd, the UK and Ireland subsidiary of the German saw manufacturer. It is the first of this make of bandsaw that AES has purchased, there being seven such machines from diverse sources currently in operation on the shop floor in Gloucester.

James Avent, one of half a dozen family members that own and run the business, describes the significant improvements the latest sawing machine has made: "The bandsaw is designed and manufactured specifically for cutting with a Tungsten Carbide Tipped (TCT) blade. We opted for a KPC (KASTO Performance Cutting) variant of the machine, with spring-loaded tensioner guides in the top of the frame. It prevents band vibration on the side opposite the point of engagement between the blade and the stock, enabling faster, quieter, more accurate cutting and reducing machine wear.

"Coupled with the robust steel and mineral cast construction of the base frame, the saw is four times more productive, like-for-like, than other machines in our factory due to the ability to use faster blade speeds and downfeeds."

He cited an example involving 10 cuts through round tool steel bar, which constitutes the majority of material processed by the Gloucester firm. The batch was completed in 45 minutes with a TCT blade on the KASTO, whereas the same job previously took three hours on another bandsaw using an identical blade, i.e. four times longer.

In the past, the stockholder sometimes had difficulty using TCT tools due to the material pinching the blade and stripping the teeth. The problem has been almost eliminated by the introduction of blades with teeth that are set to give adequate clearance. Consequently the use of bimetal blades, which currently accounts for 70 percent of throughput even though productivity is two to three times lower than when using TCT blades, will diminish over the coming years as the sawing plant is progressively updated.

As always, however, the proviso is the attainment of lowest cost per cut, so the three-fold lower cost of a bimetal blade has to be factored into the execution of each job.

Productivity increases using the KASTOtec AC4 KPC, four-fold versus using a TCT blade on other saws in the Gloucester factory and higher still when compared with using a bimetal blade, delivers a further consequential benefit to AES. It is the ability to free up space in the factory due to the machine's increased output within a compact footprint. Additionally, looking to the future, running fewer bandsaws to achieve a given level of productivity will lead to financial savings in terms of lower power consumption as well as reduced expenditure on blades and servicing.

The bottom line is that the stockholder is now able to deliver tool



A KASTOtec AC4 KPC carbide-cutting bandsaw of the type installed at the Gloucester factory of tool steel stockist and subcontractor Avent Extrusion Steels. Roentgen blades supplied by KR Saws have helped exceed all of AES's sawing objectives

steel billets to customers more quickly after orders are placed, while prices charged can be held or even lowered through greater production efficiency, making AES more competitive.

Batch size varies considerably, from ones and twos up to 300- or 400-off, average cut length being in the region of 50 to 100 mm, although it can be as short as 6 mm on the KASTO bandsaw or as long as one metre. The number of pieces and their lengths, together with the type of material to be sawn and its diameter, are entered directly via the colour touch-screen of the proprietary KASTO ProControl. Selection of the cutting parameters and instigation of the production cycle are then executed automatically.

Since the KASTO machine's arrival, further cost savings have resulted from reduced material wastage. Whereas the older saws are set to cut to  $-0, +2$  mm to ensure that material length is not undersize, the blade deviation control on the KASTOtec AC4 is so responsive that it can be set with confidence to half that tolerance. In practice, it allows cutting to within  $-0, +0.1$  mm. Over a large batch, and especially when processing expensive steels, the saving is significant and the customer also benefits by having to machine away less tough material.

Long periods of unattended running are further assisted by a pair of servo motor-driven ballscrews that steplessly adjust the downfeed to optimise blade chip load. A frequency-controlled bandsaw blade drive through a bevel spur gear exploits the advantages of both gear types, delivering 15 kW of power and infinitely adjustable cutting speeds from 30 to 300 m/min. Another feature of the machine that the stockholder appreciates is a function within the KASTO control that allows a new TCT blade to be programmed to run-in automatically at reduced speed to suit the tooth pitch. Maximum cutting diameter on AES's particular bandsaw model is 430 mm.

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# Rusch bandsaws from SAWS UK

Rusch is one of the most popular brands in bandsaw manufacture. Highly specialised Rusch cutting machines feature the latest innovative technology and offer a high degree of accuracy, while being easy to operate over a wide range of applications. Rusch bandsaws are highly durable and well-known for effortlessly cutting materials such as steel and plastic with clean, crisp edges. Today, the Rusch range of bandsaws are precision engineered in Thiene, northern Italy, but part of the company's origins lie in Austria.

In recent years, the success of Rusch has been fuelled by technological innovation. The company has created a substantial core of highly sophisticated bandsaws and continues to add to its impressive catalogue of advanced cutting machines.

Saws UK offers an extensive range of Rusch bandsaws that combine high performance with strength, reliability and efficiency. They can easily cut through all types of materials including stainless steel, aluminium and plastic. Rusch cutting machines are available in three categories: manual, semi-automatic and fully automatic.

Although manual Rusch bandsaws have a fairly compact design, they provide versatile solutions for many cutting applications. They usually offer an average capacity for cutting metal tubes and other three-dimensional profiles of approximately 170 mm up to around 250 mm.

Every model in the manual category is generally available in a single or three-phase format. A sturdy, stable base conceals a cooling tank equipped with an electric pump and pipes that provide lubrication for the blade.



Rusch semi-automatic bandsaws typically offer a higher level of sophistication and versatility compared to a Rusch manual bandsaw. Generally, they can cut a variety of three-dimensional components including metal tubes with diameters of between 200 mm and 800 mm.

Semi-automatic bandsaws from Rusch usually include hydraulic bow lifting, descent and clamping. Some selected models may offer both hydraulic and manual clamping.

The semi-automatic bandsaw may include a facility for making two-speed cuts. Other versions of the machines feature a potentiometer that can alter the cutting speed while the blade is in operation.

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# VOLLMER has a new 'side' to its saw sharpening range

Paradigm shifts in technology are something that VOLLMER has been abreast of since the company's inception in 1909. With saw blade production and servicing instilled in the very DNA of VOLLMER, the Biberach manufacturer has been the industry benchmark for generations. To retain its leading position, VOLLMER has now introduced its next generation of saw blade sharpening and servicing machines, the CS860 and CSF860.

With two new machines arriving for saw blade manufacturers, Thomas Wenger, the product manager for carbide saws and a seasoned expert with 24 years of service at VOLLMER, discusses the concept behind the two new machines that will supersede the CHD270 and CHF270 saw blade processing machines: "The CHD and CHF machines were based on a completely different construction to our new technology. The CHF side grinding machine was designed in 2000 and we evolved this machine until we reached the limit of what could be achieved with the existing construction. Now, with a new foundation, new drives and software technology we can add new benefits for our customers."

Rather than strive to squeeze further benefits from an ageing platform, VOLLMER applied its expertise and started over. Thomas Wenger says: "We identified our development goals and we started to design the CS and CSF machines. The base, the housing and everything else is now completely different to before. We have designed both new machines with the same kinematics, housing, structure and polymer concrete base, so we can have a modular foundation. This makes it easier for us to internally streamline production and reduce lead times. It also makes the machine easier for the operator to handle as there is greater synergy between the CS and CSF machines. This creates uniformity with regard to loading, setting-up, the view and ergonomics and also the programming. This uniformity of technology was our target, adopting the same CNC, operating philosophy and also the latest drive technology."

With a new foundation, construction, frame, software and hardware, the new



CSF860 is an entirely different machine from its predecessor, the CHF270. As with all machines in the VOLLMER portfolio, the foundation blocks of 'ALL' product development are flexibility, productivity, reliability and quality.

For any manufacturer comparing the machine to its predecessor, the direct comparisons will no doubt be impressive in terms of the increased capacity, flexibility and potential of the CSF860 all in the same footprint. However, the key concerns for manufacturers at present are energy costs, productivity rates and automation and the diminishing skill base in the employment market.

So, as a baseline statistic, the CSF860 is 2 to 4 percent more productive than the previous CHF270. This is a result of the machine kinematics and design, but that is just a base figure. Now, you can add up to 20 percent cycle time saving derived from ingenious software updates that precisely calculate the grinding area and eliminate 'air cutting.' There is a new saw carrier and R2 axis for flange management system that eliminates 10 to 15 minute changeover times between different blade types. The manual measuring of two to three minutes per saw blade can be eliminated with the

new measurement and calibration system, a system that also eradicates the 25+ seconds of non-productive grinding wheel calibrating and checking.

While these statistics typify just a few of the cycle time and automation benefits, energy consumption has been reduced by more than 10 percent. On top of this, there are ingenious software updates and the integration to the IoT gateway. The result is a cascading flow of benefits that will delight any customer buying the new CSF860. With flexibility and productivity mentioned above, the foundation pillar of reliability has been infused throughout the new CSF860 with the introduction of new technologies.

The build quality of the VOLLMER CSF860 is assured. The new construction introduces ergonomic features for the operator, such as a 'deep cut' door that opens further than before. This gives the operator greater access to the work envelope and for heavy blades that may need lifting via an overhead gantry, the new door design also opens at the top for overhead access.

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# MEBA implements automated and digitised sawing system with high-bay warehouse connection

MEBA Metall-Bandsägemaschinen GmbH has recently implemented one of the most complex projects in its company history. It has installed a sawing system at Günther + Schramm GmbH, the system service provider for steel, stainless steel and aluminum in southern Germany. In a very tight planning phase of under one year, the two companies jointly developed and implemented a fully automated and digitised sawing system with roller conveyors, high-bay warehouse connection, short parts disposal and groundbreaking machinery innovations. The starting point for the project was two outdated saw mills, a circular saw and a band saw, which were to be replaced. The very clear target from the customer's side was, in principle, the process should remain the same as before, but the output must be significantly increased. MEBA and Günther + Schramm were no strangers to each other. In the past, the two companies had already implemented a joint project to introduce thin-cut technology.

Andreas Priel, technical project manager and head of development at MEBA, proudly reports on the completed system: "Managing this project was a challenge and at the same time great fun. The dialogue with the customer and the collaborative project management with Günther + Schramm project manager, Mr. Walz, were very constructive. MEBA has broken new ground, especially with regard to the warehouse connection. As a result, the technology of the entire system is simply without compromise. We were able to implement the customer's wishes down to the last detail and according to the highest technical standards."



As a result, the available space at Günther + Schramm is now being used more compactly. The high degree of automation and digitisation provided a clearly measurable increase in productivity possible for the steel distributor. In phase one, MEBA evaluated the output quantity of the existing machines for two years. The new plant will be able to produce almost twice as much.

For MEBA, the special features of the project certainly included the fully automatic system in conjunction with a high-bay warehouse as well as the implementation of short parts disposal. MEBA is a specialist for band saw machines, but does not build its own storage systems and has no in-house cooperation systems. The warehouse connection therefore required a high degree of flexibility from MEBA. With this project, the band saw specialist has faced the customer's tasks and in the end has once again substantiated its motto of benefit orientation with facts.

The basis for the complete sawing system is formed by two MEBAmat 330 high-performance automatic machines. Both machines are technically identical, but arranged in a mirror image, left and right to each other. In contrast to the previous solution, the identical saws have the same components and wear parts, which optimises the procurement of spare parts and the maintenance effort. The automatic sawing machines are networked with the Remmert high rack. Orders are automatically generated by work preparation via SAP interface. Via networking and an interface, cutting values are also automatically generated and the



integration of conveyor systems to the rack warehouse takes place. The operator can select on the computer whether he wants to execute the order on the left or right of the machine, depending on the load or whether it is longer or shorter pieces. The sections are placed in the correct sorting box according to a defined distribution concept.

The sawing system is equipped with an automatic picking system, also from Remmert. The customer material is stored in cassettes, suitable for a maximum material length of 6 m. The automatic picking system removes the material from the cassette and places it on a spherical roller conveyor.

The new sawing system at Günther + Schramm is completely digitised and equipped with modern software. The MEBA NC server plays a central role in interfacing this system. The sawing system communicates with external systems, SAP, and the high-bay warehouse. MEBA has complete access to all controllers, so that Günther + Schramm can be supported via modem in diagnostics and operation.

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