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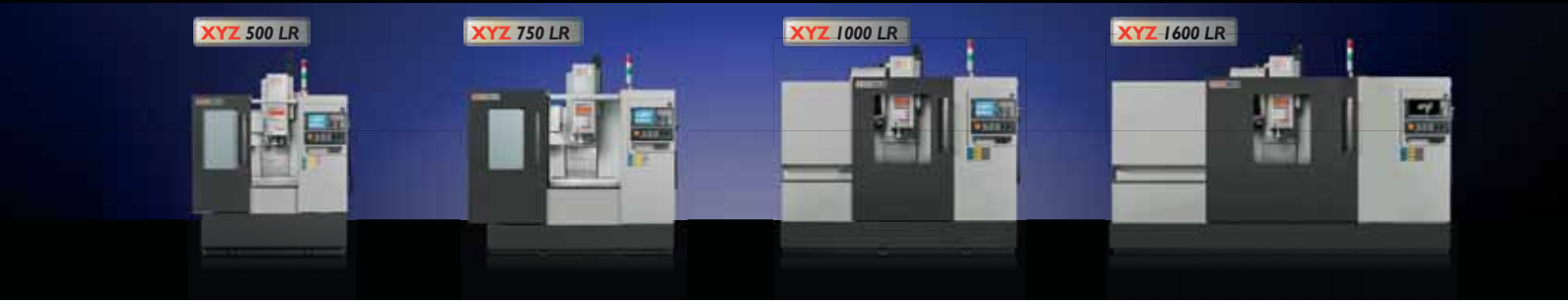

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Mazak introduces the powerful and appealing VCE-600

Designed and built in the UK, the new Mazak VCE-600 vertical machining centre is an exciting new 3-axis VMC with an impressive specification and appealing price-point. The impressive next generation machining centre presents an attractive proposition for a wide scope of manufacturers from job shops and small subcontractors through to OEMs.

The result of extensive market research, the new cost-effective VCE-600 incorporates a variety of features and new technologies that demonstrate leading productivity, performance and ease-of-use, delivered in a compact footprint with quality and service that is assured by the Mazak brand. Despite the compact 2.9 by 3.12 by 3.14 m footprint that will appeal to manufacturers with a limited floor area, the VCE-600 has a generous 1.3 m by 600 mm table with X-, Y- and Z-axis travel of 1,050 by 600 by 600 mm. This permits the machining of particularly large components, especially in the Y-axis stroke.

Travelling above this work area is a 12,000 rpm 18.5 kW dual winding spindle with 119.4 Nm of torque that provides everything a subcontract machine shop requires. At the low-winding speed range, the spindle provides exceptional torque for heavy-duty milling and drilling. At high speed, the spindle generates a high-power output at high speed for machining lightweight materials and profiling parts. The 7/24 No40 spindle with through coolant is supplied with cutting tools by a 1.9 second tool-to-tool quick-change 24 position ATC that can accommodate a maximum tool diameter of 75 mm. To improve operator access to the ATC, an optional ATC door can be specified to reduce setup times.

As well as a class-leading spindle, the new VCE-600 demonstrates its build quality with extremely rigid linear roller guides on all axes that underpin the machine's ability to perform both heavy-duty cutting as well as high-speed machining. This is complemented by direct drive servo motors on all axes and fully ground pre-tensioned ball screws that provide unparalleled levels of precision and repeatability.

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Hoffmann Group and HAIMER join forces for end mills and tool presetters

Hoffmann Group and HAIMER are now working together for HAIMER's tooling and presetting technology. Hoffmann will distribute selected product lines such as the "HAIMER Mill" as a manufacturer's brand and will count on HAIMER's Safe-λock® pull-out protection and the modular milling head system Duo-λock®. Recently, both companies signed a corresponding license agreement.

Starting in August, the new Hoffmann catalogue includes products supplied by HAIMER, the Germany-based precision tool manufacturer and quality specialist. Focusing specifically on Europe, Hoffmann will distribute the patented HAIMER systems Safe-Lock, in the product range of solid carbide end mills and tool holder technology, Duo-Lock as well as the HAIMER Mill solid carbide end mills in a wide variety of designs and the HAIMER Microset tool presetters.

Andreas Haimer, managing director and president of the HAIMER Group, is excited about the new partnership: "Hoffmann has a very strong market coverage and distribution network. In addition, the many years of expertise in consulting on all aspects of metal cutting will be beneficial for the sale of our products, which require a high degree of technical consultation. We look forward to Hoffmann working with us as a manufacturer's brand in the most important catalogue part of cutting tools."

With the manufacturer's brand of HAIMER, Hoffmann as a leading catalogue distributor, strives for a "differentiation based on the technological advantage, as well as an expansion and completion of the product offering by Safe-Lock, Duo-Lock, HAIMER Mill and the Microset products," according to Borries Schüler, member of the board for product management and engineering at the Hoffmann Group.

The cooperation between Hoffmann and HAIMER does not only include the sales activities but also the brand, technology and license partnership of the HAIMER Safe-Lock system for the Garant brand.

"The Safe-Lock system has proven itself both in the market as well as in our internal trials. Consequently, we have decided to rely on the leading system for pull-out protection and are able to equip our latest Garant end-mills with Safe-Lock in the future," explains Gregor Weber, senior vice president of cutting tools product management at Hoffmann Group. "It is particularly often used as part of modern machining strategies. With Safe-Lock, productivity and tool life can be significantly increased compared to conventional Weldon cutters. By licensing the Garant end-mills, Safe-Lock will finally become the de facto standard and enable a large number of SME customers to easily apply the latest trochoidal milling strategies," adds Tobias Völker, director of global marketing and head of distributor sales Europe at HAIMER.

Additionally, Hoffmann will integrate the HAIMER Mill series in all shank versions, Safe-Lock, straight shank and Weldon, to expand the technological product offering. The HAIMER Mill geometry is universally applicable and offers unique performance advantages, especially in steel and stainless steel, but can also be used in cast iron,

aluminum and other materials. Moreover, with its exceptional face geometry, the HAIMER Mill impresses with aggressive cutting parameters during ramping and slotting as well as unsurpassed process reliability during drilling operations.

Furthermore, as part of the new cooperation, Hoffmann will also add the complete range of the HAIMER Duo-Lock to its program. Gregor Weber of Hoffmann Group says: "Duo-Lock enhances our product offering by its highly accurate and very stable modular interface for milling. The patented system with a double cone and an additional contact area enables significantly higher cutting performance compared to competitive modular systems."

Last but not least, HAIMER Microset's UNO series of tool presetters round off the partnership. Through the cooperation within this segment, Hoffmann especially wants to enable its customers in the medium-sized business sector to take a further step towards digitalised tool data management and communication with CADCAM systems as well as machine controls.

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Sustainable thinking and innovative action

Many manufacturing companies are aiming to ensure their production processes are environmentally conscious and ultimately climate neutral. With its latest sustainability strategy, the CHIRON Group and its UK partner, the Engineering Technology Group (ETG), are both playing a role in these efforts. The CHIRON Group will soon be CO_2 neutral, it will expand its existing capacity for machine refurbishments and it will use Additive Manufacturing (AM) to broaden its range of applications in the automated repair of forging dies. All of this technology is now available from ETG.

From manufacturing a hundred watch cases to large production runs of structural components for E-mobility, all manufacturing consumes resources and energy in proportion to the machining volumes, both in terms of manufacturing the machinery and using the machinery for production. The objective of the CHIRON Group sustainability strategy is to continuously improve energy efficiency at all levels.

By the end of 2022, manufacturing and assembly processes in the Chiron Group will be climate neutral, a milestone for the company

Green milestone for CHIRON Group locations

With long-term investments in heat recovery and photovoltaic systems and the commitment to cover any additional electricity requirements exclusively from renewable sources, the CHIRON Group has reached a major milestone and created a sustainable basis. The company's manufacturing and assembly processes will be climate-neutral by end of 2022. This means that CHIRON machines purchased from ETG will be supplied from this environmentally sustainable manufacturing business.

Opting for good-as-new is more sustainable

Conversion and retrofitting, partial and complete refurbishments and component repair; there are many options for increasing efficiency and extending the lifecycle of a CHIRON or STAMA machining centre. Regardless of the feasibility of a given renewal measure, the processes covered by the 'refurbishment' expertise are always a more sustainable alternative to purchasing a new machine. A complete machine refurbishment provides average savings of 40-50 percent of the total material required for a new machine.

A further component of this sustainability strategy is expanding and actively promoting this business area. The comprehensive range of services offered for all CHIRON and STAMA machining centres is unique and demand remains stable at an encouragingly high level. Specific plans include expanding the assembly and storage area by 80 percent, increasing personnel to match and preparing employees appropriately for the new challenges and concepts.

Automated repair with LMD triples the service life of cutting rings

The AM Cube 3D metal printer is the only product in the range that does not remove material but instead stacks it up using Laser Metal Deposition (LMD), with powder, wire or both in combination. Additive manufacturing for coatings, repairs and 3D printing is still a recent technology for the CHIRON Group. That said, the technology has matured further with experience and the range of applications has broadened to include repairing forged cutting rings among other processes.

This results in triple the service life in comparison to previous repair methods. Crucial factors for achieving this include selecting the correct material, ensuring high procedure quality and an automated process. In day-to-day use, the AM Cube provides users with the ability to repair even large tools and moulds. It also boasts reliable spare parts logistics and, as experience and expertise in its use grows, it enables the implementation of proprietary product innovations and services fully in line with sustainability goals.

ETG's operations division is based in a new 17,500 sq. ft. facility located in Wellesbourne. The company has extensive and proven expertise in turnkey CNC engineering and automation, offering industry experience and capability from one source.

These include engineering and management skills such as programming, logistics, systems integration and project management necessary to analyse, design and install a solution in order to create the most appropriate response.

At the facility, the operations department take total care of machine preparation prior to customer delivery. This dedicated team are ready for any challenge, be it a "directly from stock" simple machine order to complex bespoke turnkey solutions encompassing design and manufacture and engineering of process through to final acceptance.

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XYZ Machine Tools' new showroom opens for business on 21st September

With 19 machine tools under power ready for demonstration, the grand opening of the new XYZ Machine Tools showroom in Huddersfield will take place on Wednesday 21st September. This will provide an ideal opportunity for anyone considering a machine purchase, with XYZ Machines on show ranging from the entry level KMX 2000 turret mill, through the ProtoTRAK range of bed mills and lathes, as well as Siemens controlled machining and turning centres, including the UMC-5X simultaneous 5-axis machining centre and the brand new SS65 twin spindle turning centre.

The doors are open between 9 am and 3 pm with no requirement for pre-registration. XYZ Machine Tools team of area sales managers and applications engineers will be on-hand to provide demonstrations on any of the machines and to discuss individual machining requirements. Located just off junctions 24 and 25 of the M62 at Innovation 25, Unit 7 Bradley Business Park, Dyson Wood Way, Huddersfield HD2 1GN, the XYZ Machine Tools Huddersfield showroom is ideally located for customers along the M62 corridor.

In addition to refreshments being served throughout the day, a buffet lunch will be available at midday and every visitor will receive a free vernier caliper, delivered after the open day as a thank you for attending.

XYZ has been developing, testing and refining its range of machine tools for over 35 years. Its winning principles of combining outstanding build quality with some of the world's best control systems, namely ProtoTRAK® and Siemens, has seen the product range become the nation's first choice for prototype and low volume production. It carries over 300 machines in stock, any of which can be ready for delivery within days of an order being placed. With 18 service engineers based nationwide, if your machine needs attention XYZ aims to be with you the same or next day. It has an electronic service system where information is sent to engineers as soon as it is reported leading to quick responses.

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Stuttgart success story continues

The heart of the metalworking industry beats again in South Germany

AMB 2022 will take place from 13th to 17th September at the Messe Stuttgart. This next edition of the top metalworking trade fair will welcome more than 1,500 exhibitors to showcase their latest products on a total exhibition area of 120,000 sq metres as well as over 91,000 trade visitors, who will discover the true potential of the future market trends.

Every two years since 1982, AMB has presented the highlights of the international metalworking industry. It focuses on products, technologies, innovations, services and concepts for people who are passionate about metalworking. This makes it a marketplace, training and networking platform all in one. Whether you are visitor or exhibitor, over the years, AMB has become one of the most important events of the industry.

Based on the current number of exhibitors, the ratio of national to international exhibitors reflects the highly international nature of the exhibition. Currently standing at 31 percent of the exhibitors and 29 percent of the exhibition space, the international figure is in keeping with that of AMB 2018. These figures demonstrate that it is worth making the trip to Stuttgart to see the latest developments in the metalworking industry, nurture existing business relationships and seek out new partners.

The net area available for allocation to exhibitors is currently 73,000 sq metres. Given that the total gross area available is around 120,000 sq metres, visitors to AMB 2022 will therefore be met with packed halls and a fully occupied site. "Momentum is high and everything is set for the success story of AMB to continue," says director of mechanical engineering and production Gunnar Mey who, along with his team, is responsible for AMB.

AMB 2022 enhanced with digital expansions

Major changes await exhibitors and visitors with respect to digital offerings. These have been seamlessly integrated into the exhibition programme. Leading the way here is the innovative online exhibitor overview, in which exhibiting companies can now provide videos, animation sequences, product brochures and the like for download in addition to static information and they can also incorporate interactive content or their social media presence. What's more, companies can add multiple contacts for different target groups to ensure that the right people are brought together at the stand.

It will also be much easier for visitors to plan the route to the stands they are interested in visiting. They can plan their own specific topic-based tours using a new function in the online exhibitor overview, enabling them to perfectly arrange their visit to the exhibition in advance. These self-guided tours are managed by means of numerous filter options, which will take visitors to exhibits and applications at stands showcasing the various highlight topics.

The exhibition is also pursuing a digital course when it comes to presentations too. For example, presentations covering different topics each day will be held in the Trend Lounge in the ICS foyer and the content will be recorded and made available on demand once the exhibition has finished. Spotlight topics include additive manufacturing, metal as a material, industrial security, digital networking, climate change and sustainability as well as start-up pitches.

Live production will also be seen at the special show for young people, which is organised by the Mechanical Engineering Youth Foundation and aims to inspire young people to consider a career in mechanical engineering and plant construction and to showcase new technologies used during training. From the stand in the Atrium, an entire process chain from the drawing to the manufacture of a Formula 1 model car will be reproduced. Apprentices from the partner companies involved will be on hand to answer any questions.

As usual, travelling to and from the exhibition site couldn't be more straightforward. The exhibition ticket includes a public transport pass covering transport to and from the trade fair. Thanks to the recently extended U6 tram connection, there is now an additional transport option from the centre of Stuttgart as well as from the Filder Plain area, with services every 10 minutes. The journey time from Stuttgart central station is 32 minutes.

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AMF to exhibit clamping technology for inner values

At the AMB trade fair, Andreas Maier GmbH & Co. KG (AMF) is exhibiting a new collet for internal clamping. This new product consists of a basic element and an attachment for internal clamping. Users can adapt this clamping attachment to suit the internal contours of their workpieces. This unique clamping technology enables even workpieces with blind holes to be clamped safely and without distortion. A clamping control feature provides feedback about the workpiece being clamped securely.

"The clamping screw on the side means that users can also internally clamp workpieces without a through hole. That is as compelling an argument as our unique clamping control feature," states Silvia Herold, product manager at Andreas Maier GmbH & Co. KG in Fellbach.

At the AMB trade fair, the clamping technology experts from Fellbach are showcasing their latest product, an internal clamping collet. This consists of a basic element that can be clamped to the machine table using one of four different options. The collet attachment for this is hard-anodised. It is available in two sizes with external diameters of 70 mm or 99 mm.

Unique clamping control for enhanced safety

Users can machine this collet attachment to adapt it to match the internal contour of the workpiece they are clamping. However, what makes this new exhibit from AMF so special is that no through holes are needed in the workpiece to achieve safe internal clamping. With mechanical lateral actuation, workpieces with a blind hole can also be clamped securely and without distortion. As a unique feature, this basic element is also equipped with a clamping control unit made of stainless steel. This enables users to establish that the workpiece really is clamped properly. This significantly improves process reliability.

By adapting the collet attachment to the internal contour of the workpiece, free-form contours can be clamped safely and securely. The minimum diameter is 32 mm. During the adjustment process, a retaining ring ensures that the workpiece can then be clamped securely for the next process. The minimum clamping depth measures 10 mm. Depending on variant, the maximum clamping depth measures 40 or 44 mm respectively.

Flexible with four mounting options

To secure the basic element to the machine table, it has a circumferential clamping rim. Flat surfaces on the sides enable it to be mounted in the machine vice. Alternatively, it can be secured in the machine table using T-slots. In addition, there are base mounting points, sizes K10 and K20, for the AMF Zero-Point-System, as well as indexing grooves for the positioning of AMF zero-point clamping modules. The mechanism in the basic element is protected against dirt and cooling water. At the AMB trade fair, AMF is showcasing the collet for internal clamping as the logical further development collet for external clamping from the same series. The basic element can be used for both collet attachments.

Today, Andreas Maier Fellbach (AMF), originally founded in 1890, is a one-stop supplier in clamping technology and is a market leader. With a global market presence, the company and its employees always have an open ear for the problems of their customers. By listening to these needs and through its strong problem-solving ability, professional consultancy, intelligent engineering and high manufacturing quality, AMF repeatedly develops project fabrications and customised solutions for customers as well as standard solutions that succeed in the market again. With more than 5,000 products and numerous patents, it ranks among the top innovators in the industry. Speed, flexibility and 230 well-qualified employees guarantee success at Andreas Maier GmbH & Co. KG. In 2021, AMF earned a revenue of almost 44 million euro.

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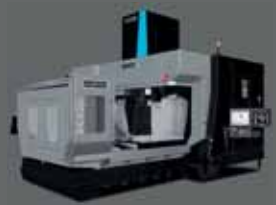


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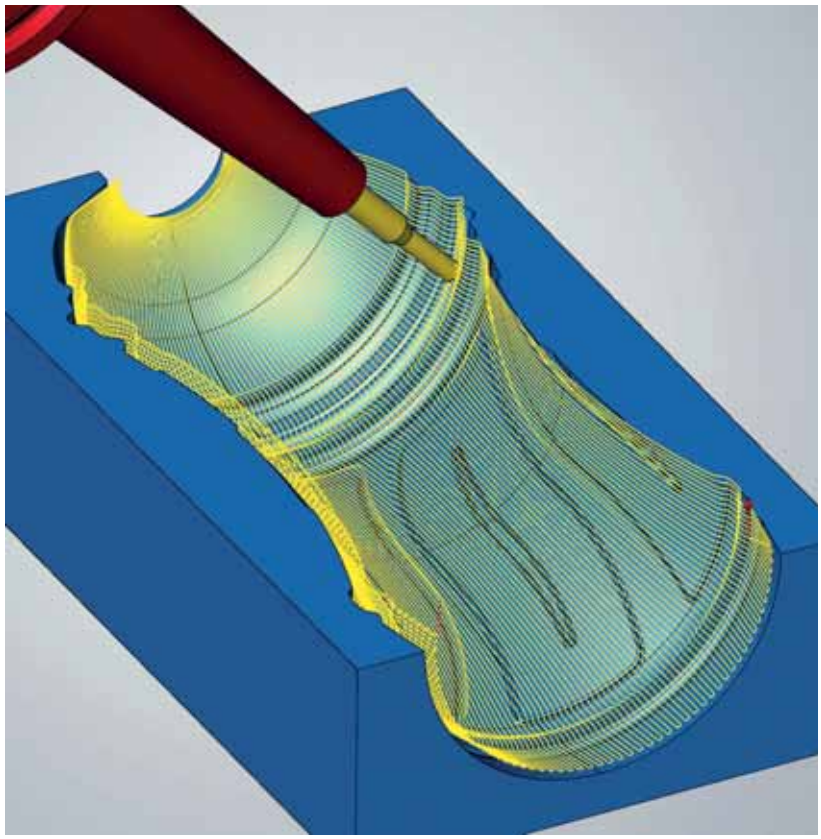
The CAM system for networked production processes

OPEN MIND Technologies AG will be exhibiting at AMB together with Hummingbird Systems GmbH. Not only will this highlight the strategic partnership between the CADCAM manufacturer and the MES provider acquired at the beginning of the year, but OPEN MIND and Hummingbird will also address the role of CAM in networked production processes under the banner of "Create the future of manufacturing together."

The way a CAM system interacts with an MES or other IT systems such as PLM or a tool management system is becoming increasingly important. Networking and communication without media disruptions are the bare minimum required to optimise processes within the context of digitalisation. Visitors to AMB can find out what contribution hyperMILL® can make to networked manufacturing on OPEN MIND and Hummingbird's booth. For example, integrating the CAM system with an MES creates more agile and efficient planning, control and automation. All production-related data is available everywhere throughout the company at any time and users benefit from a uniform manufacturing management system.



Working with a digital twin

Bidirectional communication with machine tool controls is particularly important in networking with other systems along the process chain. hyperMILL VIRTUAL Machining closes the gap between the CAM system and the physical machine environment. If the CAM software can work with a digital twin of the physical machining process, then this opens up new options for generating, optimising and simulating the NC code safely. hyperMILL BEST FIT is an impressive example of this. It is a new type of component alignment system for the subsequent processing of cast, welded or additively manufactured components. This sees the NC program adapt to what is physically happening in the workspace, rather than the clamping being adapted to the NC program, which has been standard practice until now.

Component machining strategies explained

Workstations that demonstrate forward-looking technologies such as process automation or CAM programming are not the only things that will be on show. Examples of machining with perfect surfaces will also have their chance to shine. For instance, a bottle-blow mould is an excellent showcase of pioneering strategies such as 5-axis radial machining. hyperMILL has proven itself as a comprehensive CAM solution for the tool and mould making industry. The blow-bottle mould that will be on display at AMB 2022 is a perfect example of the process-optimised production of round moulds with surfaces that require zero post-processing.

A look at what's to come in hyperMILL 2023.1

Visitors to AMB can see the current version of hyperMILL and get a sneak preview of the upcoming release. For example, there have been some improvements made to hyperMILL VIRTUAL Machining. Most importantly, complete support for mill-turn machines has been added along with performance improvements. This means that the NC code for this type of machining will also be generated, simulated and optimised using hyperMILL VIRTUAL Machining. There will also be improved support for large machines with more than five axes.

OPEN MIND is one of the world's most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

It develops optimised CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning and machining operations like HSC and HPC are efficiently built into the hyperMILL CAM system. hyperMILL provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

The CADCAM solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mould manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America.

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www.openmind-tech.com

Hall 2 - Stand B20

Horn presents new Supermini Set at AMB

Horn now offers users its proven Supermini tool holder system with face clamping as a set, thereby responding to customer requests for different tooling system heights. The new Supermini Set will be presented for the first time at AMB 2022.

With this holder variant, clamping is not carried out via the lateral surface of the cutting insert but via a clamping wedge on the face. This results in a greater holding force on the insert and thus high rigidity of the entire system. Furthermore, this style of clamping increases repeatability when changing the insert and provides better utilisation of the available space. This turns out to be a great advantage on Swiss-type lathes, as the user can change the cutting insert without removing the toolholder.

The set consists of a round shank holder and three different clamping elements. The latter are suitable for the three different insert heights of the Supermini system, 03, 04 and 05. A customer can select the desired diameter of the round shank holder when ordering. Horn offers it in the diameters 10 mm, 12 mm, 16 mm, 20 mm, 22 mm, 25 mm and 28 mm Inch dimensions are available in 1/2", 5/8", 3/4" and 1" diameters. All sets are available from stock.

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www.phorn.co.uk

Hall 1 - Stand J10

Complete machining solutions from WFL at AMB

At AMB 2022, WFL Millturn Technologies will be presenting the new M20 MILLTURN complete machining centre for the first time. Alongside gear skiving technology, there is a clear trend toward automation and the integration of sensors. The latest solutions from WFL range from smart software to screw programming through to intelligent tools and clamping devices.

WFL is the only manufacturer worldwide that concentrates exclusively on the production of multifunctional complete machining centres. In many high-tech companies today, the trade name MILLTURN stands for the central machine tool for the production of complex components with the highest precision.

The M20-G showcased at AMB is equipped with an innovative automation solution: the intCELL. The integrated production cell is fitted on the right-hand side of the machine with the workpieces supplied on a strip accumulator. With the integrated loading concept, WFL has reduced the space requirement by 50 percent in comparison to a conventional production cell. The M20's integrated loading feature is designed for chuck parts with a diameter of up to 300 mm and a workpiece weight of 15 kg. For shaft parts, a workpiece diameter of 100 mm and a workpiece length of 300 mm is possible.

The turning-boring-milling unit with integrated spindle motor and a B-axis with torque motor are entirely new features. The individual tool holder with B-axis on the lower slide is another highlight. The upper and lower system can be used simultaneously and both systems are supplied by a reliable and dynamic tool changer from a shared magazine. This allows even complex components to be machined with optimal efficiency, and the setup of the tool turret is no longer necessary. The tool can be moved up to 100 mm below the turning centre, so drill patterns with diameters of up to 200 mm can be produced on the face with a high level of precision and without turning the C-axis.

Universal machining solutions with the M50-G MILLTURN

The new M50-G MILLTURN generation, with greater centre distance and improved performance, will be another highlight of the AMB. The optional centre distance of 6,000 mm enables efficient machining of long shaft parts. When designing the M50, WFL implemented some of the features of the larger M80. The machine's existing potential is fully utilised, particularly in terms of the increased drive power, combined with the HSK-A100 or Capto C8 tool accommodation. The turning diameter is available up to 670 mm and the fully developed, proven machine concept of the M50 MILLTURN has also been given an attractive ergonomic finish. A separate pick-up magazine is also available for very long and/or heavy tools. Workpieces with a length of 1,600 mm can be automatically inserted and changed. The standard disc magazine can be expanded to up to 200 positions.

On this machine, trade fair visitors will be able to witness a turbine blade/screw being machined live. Components such as turbine blades or plasticising screws require both dynamic and stable machining concepts. A special clamp from the manufacturer Grasch can be used to clamp rectangular raw materials easily and securely, a fundamental requirement when machining turbine blades. Technologies known as 'helical spiral milling' and 'helical longitudinal milling' are used to machine the blade.

ICOtronic and ultrasound measuring

The ICOtronic tool, which is fitted with sensors, provides information on the machining process as close as possible to the cutting edge. This should not only optimise milling processes in the future, but also increase the machines' productivity. The demo at AMB will give a small insight into WFL's wide variety of development projects.

Ultrasound measuring will also be

When the cycle is running, the friction values of the axes and spindles, as well as the temperature in the milling spindle housing and the vibration or the rolling bearing condition value of the front milling spindle bearing are continuously recorded and stored on the control system. Using Condition Monitoring Viewer, it is possible to select the data of the various Condition Monitoring runs on the control system, graphically overlay them and analyse them according to time in this way. This allows for the early detection of possible malfunctions and minimises unplanned downtimes.

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Hall 1 - Stand A11

demonstrated live for the visitors to the trade fair. The automatically loading ultrasound measuring probe enables a fully automated measuring process. The large measuring range, 1.5 - 30 mm, offers further benefits. Ultrasound measuring is extremely well suited for calculating the hole run-out and diameter of very deep holes.

Easy screw programming with ScrewCAM
ScrewCAM will be used at AMB to demonstrate the latest and most innovative software for programming plasticising screws with complex geometries. The geometrical functions that can be manufactured include, among others, single or multi-threaded screws, variable depths, flexible pitch adjustment, wall shaping and wall incline. In addition, the entire NC programme will be checked for collisions and the correctness of the workpiece geometry produced, using a material removal simulation and geometrical verification against the 3D target geometry of the screw. The result is a verified NC programme with estimated machining time.

Operational data acquisition with myWFL
As introduced at AMB, the new operational data acquisition system is myWFL Cockpit. Machine and program states will be displayed according to chronological order, productivity and technical availability. You can view this on a web browser via the control system, either on a PC or a mobile device. This means that the user can always be well-informed about their machine productivity.

Also new with myWFL Cockpit is the integration of the energy usage measurement device myWFL Energy which displays the current power and energy consumption data and that of each workpiece. Another highlight of myWFL is the integrated Condition Monitoring cycle.

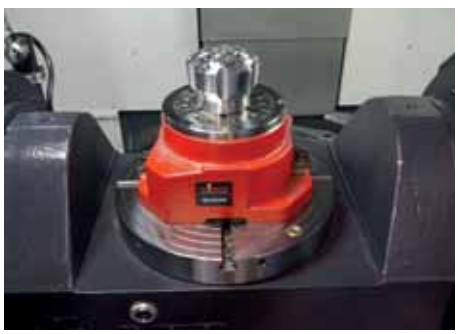
Hainbuch to show new technology at AMB

Workholding expert Hainbuch will be returning to the AMB exhibition to demonstrate a host of new and established workholding technology. The company will be introducing the latest innovations in flexible, powerful, precise and rigid workholding technology.

With an unfathomable depth of products for milling, turning and stationary applications, Hainbuch will be showcasing the MANOK Plus system at AMB. This extended variant of the groundbreaking manual MANOK stationary chuck differs through the use of adaptation elements. With the MANOK Plus system, many more clamping possibilities are now available in combination with the MANDO Adapt mandrel-in-chuck or the jaw module for even larger clamping diameters.

The Manok workholding system is ideal for 5-axis machining and stationary workholding applications as the chuck operates with a pull-back action, so components are positively pulled against any internal stop to give incredible power and rigidity whilst reducing vibration during heavy-duty milling operations. To improve setup and changeover times, the Manok incorporates a manual changing fixture that changes the clamping heads quickly and easily in a couple of seconds. In addition, customers can mount an end-stop inside the Manok in no time at all by simply fastening the inside end-stop directly onto your machine tool table or by mounting a front end-stop on the face of the clamping taper.

The Manok is versatile and simple to operate and its application range is almost limitless. The Manok can be applied to milling machines and CNC machining centres, CMMs, pallet clamping applications, broaching machines, angle plates and indexable heads, grinding machines, drilling machines and even used as a fixed desktop assembly station.



As well as the Manok and Manok Plus, Hainbuch will be showcasing the new MANOK Plus CFK. Developed with a lightweight CFRP design, the MANOK Plus CFK enables users to save half of the weight. The lightweights are easy to set up and particularly well-suited for milling machines and machining centres with small load weights. Plus, they protect machine components which ultimately helps the machine accuracy. When loading manually or with a handling system, often the only possible solution is a lightweight stationary chuck.

Alongside the extensive Manok offering at AMB will be the Hydrok hydraulically actuated stationary chuck. The choice product for 5-axis machining or efficient multiple clamping, the Hydrok Intelligent modular system offers greater possibilities than ever before. Depending on size, the Hydrok can be used with all clamping device adaptations, such as the MANDO Adapt mandrel-in-clamping device or with the jaw module. Thus, in the future, you can also rely completely on the intelligent Hainbuch

modular system, even for your stationary clamping device.

The Hydrok incorporates typical Hainbuch features such as user-friendly setup, parallel clamping, optimal power conversion, extreme rigidity and superior holding power. With repeatability of less than 0.01 mm possible, the Hydrok is ideal for 5-sided machining as well as flexible clamping scenarios such as mandrel clamping or jaw clamping thanks to the HAINBUCH modular system.

With the Hydrok and Manok systems at AMB 2022, Hainbuch will also be showcasing the Mando Mandrel system. The efficient and economical system provides extremely high clamping forces even at the smallest clamping diameters. In many cases, the jaw chuck is a makeshift solution. However, even conventional mandrels with slotted clamping sleeves quickly reach their limits in terms of accuracy, rigidity and opening stroke. The Hainbuch segmented mandrels use state-of-the-art clamping technology that is convincing, even in the most critical applications. The Mando system offers a large clamping range from 8 to 200 mm diameter while the vulcanised clamping elements provide exceptional vibration dampening.

Another innovation that will interest AMB visitors will be the impressive TestIT clamping force gauge system. Developed in conjunction with Siemens, the new software system is available on a data carrier for installation on Siemens CNC controllers. This means that a separate laptop is not needed and manufacturing with 'theoretical clamping forces' is also a thing of the past. Thanks to TestIT, the operator always knows

what clamping forces exist and where. Furthermore, the operator can understand the actual maintenance status of the clamping device.

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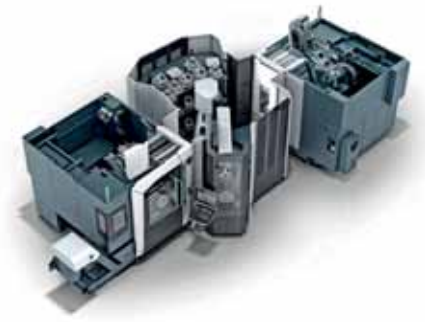
Hall 1 - Stand E10

DMG MORI to focus on automated, digitised manufacturing solutions

DMG MORI will feature innovative solutions for autonomous manufacturing at AMB 2022. Twenty-two machines, half of them automated with innovative workpiece or pallet handling, will be displayed across an area of 2,000 m². There will be a full range of CNC prismatic machining and turn-milling solutions, reinforced by further integration of gear cutting and grinding.

In addition to showing the MATRIS Light cobot and the Robo2Go MAX for automating large lathes and turn-mill centres, DMG MORI will premiere the PH Cell Twin for automatically suppling, for example, two DMU 50 5-axis machining centres with up to 30 machine pallets. Two further compact automation solutions will be on display: the WH 3 Cell modular workpiece handling system and the TH-AGV automated guided vehicle, which will be loading tools into a DMC 80 FD 5-axis mill-turn centre.

Digitalisation tools will be demonstrated, from customer-oriented engineering with Digital Twin, through connectivity solutions



World premiere on the DMG MORI stand at AMB 2022: With the PH Cell Twin, two machining centres such as 5-axis DMU 50s can be automatically supplied with machine pallets

for open machine-to-machine communication, to intelligent planning and control systems. Completing the portfolio will be TULIP, a no-code app for shop floor operator support and the successful online service portal my DMG MORI, which 30,000 customers have opted to use since its launch in 2019.

Automation of production is currently the most important topic in machine tool manufacturing, which is why DMG MORI aligns its entire product portfolio with this goal. From standard systems to turnkey projects, it designs and implements holistic manufacturing solutions that increase productivity.

The company will exhibit, among other things, the RPS 14 circular pallet storage system feeding an NHX 5000 horizontal machining centre, as well as the Robo2Go MAX on a CTX gamma 2000 TC lathe and Robo2Go Milling on a DMU 40 eVo vertical machining centre.

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Hall 10 - Stands C10/C10.2/C10.3/ C10.4/C10.5

Long-travel clamp for automated production

A hydraulically-actuated, double-acting clamp with a long-travel, ideal for workholding in production systems having robotic or otherwise automated component load/unload, has been introduced by Roemheld. It will be shown for the first time on the German manufacturer's stand at AMB.

The HILMA.ASH clamp has 80 mm of travel, so a single workholding arrangement can accommodate component families that would otherwise require investment in several different standard vices of more restricted travel. Therefore fewer conventional, workpiece-specific clamping devices are needed, saving expense. Setup times are reduced and a further advantage is that spindle uptime is maximised on the machine tool.

The long travel offers sufficient flexibility for automated production of workpieces requiring more than one operation, while automated jaw change is possible using the same robot that loads and unloads the parts. It means that, without manual intervention, raw billets and semi-finished components can be held and machined alternately with different clamping forces.

Roemheld (UK) Limited was founded in 1975 to supply innovative workholding solutions to the UK and Ireland. From its base in Hertfordshire, it is proud to provide workholding and materials handling solutions to a wide range of companies from large OEMs down to the smallest of machine shops.

It provides sales, service and ongoing technical support to customers across varied industry sectors and it is involved in training

Roemheld's new HILMA.ASH clamp has an 80 mm stroke for accommodating many different component sizes

programmes designed to support the next generation of engineers. As part of the Roemheld group, the company incorporates the power workholding specialists HILMA and STARK which are renowned for their leading research and development. Based at Laubach in Germany, the Roemheld group is widely considered to be a leader in the field of hydraulic power workholding for metalcutting production engineering.

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Hall 1 - Stand H70

thyssenkrupp Aerospace and Deutsche Aircraft enter strategic partnership

Deutsche Aircraft and thyssenkrupp Aerospace have announced that they are entering a strategic partnership to develop a material supply chain solution for the D328eco™ aircraft. thyssenkrupp Aerospace, a company of thyssenkrupp Materials Services, will be responsible for the design of the material planning and procurement processes between multiple material and sub-tier suppliers.

thyssenkrupp Aerospace's supply chain experts will consult Deutsche Aircraft to develop the basis for a control tower solution that will ensure an optimal coordination of supply flows. A transparent and centralised data assessment stands at the core of the solution, to align demand and supply within the manufacturing network, cutting out obsolete inventories and material shortfalls.

Patrick Marous, CEO of thyssenkrupp Aerospace says: "We are delighted to engage in this strategic partnership with Deutsche Aircraft. We believe that the best way to design an efficient and resilient supply chain is to integrate a strategic partner into the aircraft manufacturer's value chain early on. Our control tower solutions are tailored to the specific needs of each customer and are designed in a collaborative co-creation process."

CEO of Deutsche Aircraft, Dave Jackson says: "Together with thyssenkrupp Aerospace our mission is to drive the aviation industry towards a more climate-friendly supply chain to set new benchmarks when it comes to new aircraft manufacturing processes. Although strongly integrated in Germany, this initiative is part of a global effort to change the way our supply chain partners can provide more environmentally-focused strategies to eventually reduce the environmental impact of such large-scale manufacturing projects."

Director of supply chain at Deutsche Aircraft, Maximilian Fahr adds: "The strategic capabilities of thyssenkrupp Aerospace will bring significant benefit across the supply chain and enable taking procurement decisions, in particular in times when global supply chain resilience is being challenged. The digitalisation of supply chain flows will enable proactive risk management and anticipate in an advanced risk management culture across the entire supply chain."

This partnership with Deutsche Aircraft is yet another step in thyssenkrupp Aerospace's strategy to offer materials as a service to its customers. As one of the world's leading supply management and Third-Party Logistics (3PL) service providers in the market for raw materials, thyssenkrupp Aerospace offers end-to-end solutions to build resilient and digital supply chains. The company's service portfolio is modular and scalable, encompassing all development stages from designing to managing and operating the supply chain for its customers.

With the D328eco, Deutsche Aircraft is driving the transition of aviation to a more climate-friendly future by developing an aircraft that will be more environmentally-friendly and efficient to operate but also to produce. Deutsche Aircraft rigorously selects its suppliers and partners to develop more sustainability-driven processes that ensure higher efficiency and cost savings.

thyssenkrupp Aerospace is a leading global company that delivers supply chain solutions for the aerospace industry. The company's network spans more than 40 sites in over 20 countries and its over 3,500 customers include the world's biggest aerospace manufacturers and their suppliers. thyssenkrupp Aerospace offers supply chain management as well as a wide range of supply chain and manufacturing services. These include procurement of raw materials, warehousing, precision processing, third-party logistics, and just-in-time delivery.

Founded on the proud heritage of Dornier and Germany's reputation for engineering design, quality and innovation, Deutsche Aircraft is the new purpose-driven German OEM. Built on the expertise of 328 Support Services GmbH, Deutsche Aircraft will enable the future development of the D328 platform. It will exploit future technologies and capabilities to produce a more efficient, economic and environmentally friendly aircraft to drive the future of aviation toward a zero-emission flight objective. Together with the participation of the German Government, Deutsche Aircraft is leading the way in a new era of clean aviation and is addressing the need to protect our planet and inspire future generations, for cleaner, safer and more efficient air travel.

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Starrag's four-machine FMS will allow aerospace specialist to cost-effectively meet rising demand

A major supplier of aerospace parts in Italy is depending on a Starrag-developed Flexible Manufacturing System (FMS) to deliver exceptional machining rewards and reduced piece part costs when it commissions a four-machine, minimally manned automated solution. It will operate around-the-clock to meet rising demand for certain aero-engine components.

Based on a quartet of Heckert HEC 500 X5 multi-axis machining centres, each featuring a 5-axis trunnion-type table, the FMS will be served by an integrated pallet system and a centralised tool storage facility that will house an amazing 2,000 tools to cover all eventualities in the single setup, multi-task machining of the family of parts.

In addition to highly-efficient cutting and cycle times, the Heckert machining centres will also ensure consistently high-accurate cutting to within two/three microns of the titanium and high alloy steel workpieces which range in size up to 500 mm by 500 mm.

However, such demanding requirements do not daunt Starrag, which has more than 40 years' experience in delivering FMS of all sizes as turnkey solutions to minimise floor-to-floor times as well as to reduce component costs.

These systems may contain varying Starrag Group machines plus the integrated technologies of, for example, workpiece handling/holding and transport, robots, bespoke fixturing, pallet systems and automatic rail-guided as well as autonomous vehicles, cell control, including Starrag's Integrated Production System and Industrie 4.0 philosophies, tool storage systems, chain and tower. Complementary processes include grinding, deburring, component cleaning and finish inspection.

Collectively, the key benefits of Starrag's unrivalled expertise in developing FMS solutions are: reduced unit costs thanks to fully-automated, yet flexible complete machining with less manpower; customised solutions for batch sizes from one-offs to large quantities; production based on demand with low levels of material inventory; guaranteed highly effective, just-in-time production; unmanned machining in multiple-shift environments; reduced production and throughput times while maintaining high-level processing quality; optimum conditions for system extension/integration of additional machines; interlinking of a variety of machine designs, as well as auxiliary operations such as inspection, engraving and deburring stations.

This latest FMS for the Italian aerospace customer started, like all Starrag machining solutions, with Starrag meeting the needs of the customer and the components rather than with a machine sale. The HEC 500 X5 was, however, compared by the customer to similar, competitor models. Starrag's investigations led to the development of an all-embracing solution that is specific to these aero-engine workpieces, reflecting Starrag's quest to continue to be the customer's 'application champion' based on its strategy of 'engineering precisely what you value'.

In this case, the HEC 500 X5 machining centre was the optimum choice in terms of specification and performance. Not only does the machine's X, Y, Z axes envelope of 1,000 mm by 800 mm by 1,000 mm and 800 kgs capacity 500 mm by 500 mm pallets meet all workpiece size demands, but the up to 82 kW/1,500 Nm/15,000 revs/min 65 m/min rapid traverse rate spindle also provides the required power and cycle, traversing and machining time speeds. Additionally, the machine's B rotational axis can rotate 360° at 80 revs/min while the A swivel axis operates at -45° to +91° at 15 revs/min to further enhance the machine's multi-axis capabilities.

However, it is the machine's high-rigidity build values that are especially important in meeting the demanded micron machining accuracies for the very tough workpiece materials.

For instance, the machine's extremely high levels of accuracy, positioning accuracy is just 0.006 mm, also depend on rail guides in all axes with pre-loaded guiding carriages and pre-loaded ballscrew drives with counter bearings. Additionally, the NC rotary table has an input resolution of 0.001°.

Such values are also courtesy of rigid build qualities that include excellent damping characteristics of the machine bed, mineral cast for superb temperature-stability and vibration-resistant characteristics, column, table and rotary swivelling units, as well as even for the tool and collet chucks.

Everything plays a part in enabling the FMS to consistently achieve micron accurate machining.

It is one of a new generation of Heckert machining centres that utilise every technical advancement in the book to be affordable yet high-performance. Energy efficiency is another aspect of the machine, with users gaining reduced operating costs. The result is a machine with an unmatched cost to performance reputation for reducing component costs. It has a reputation that can only be enhanced by its integration into an FMS.

Modular solutions to digital manufacturing

Starrag's Integrated Production System (IPS) provides users with a modular solution that can be aligned with specific requirements, allowing customers to effectively select their own solutions to realise the benefits of Industrie 4.0 through automating and digitising production. The IPS platform can offer functionality to meet a number of individual tasks, including:

• Internet of Things (IoT): Cloud-based solutions help users analyse and optimise processes more specifically to further increase productivity.

• Human-Machine Interface (HMI): With touch sensors, the user interface can be used confidently on the shopfloor, even by operators wearing work gloves.

• Machine Production System (MPS): This monitors production in real time and protects people and the machine against incorrect operation and collisions.

• Efficiency control: With a number of measures, the holistic concept reduces energy consumption by more than 20 percent.

• Process Quality Control (PQS): A chatter monitor warns of dangerous vibrations when machining.

• Machine Qualification System (MQS): An integrated fingerprint module informs the user about machine condition and, where necessary, displays the corresponding maintenance instructions on the HMI.

At the heart of IPS is a cell controller, developed by Starrag, which monitors the machine(s) and can guide and control the entire production process in conjunction with a higher-level ERP system where applicable. The cell controller also ensures digital transparency by visualising system status, for example.

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GKN Aerospace supports restoration of a historic Spitfire to inspire engineers of the future

GKN Aerospace has stepped up to support the return to flight of a historic Spitfire PR.IV aircraft that was shot down over Norway during WWII. More than 80 years ago, GKN Aerospace supplied fuselage frames and system components for Spitfire AA810 from its facility in East Cowes, on the Isle of Wight. Once restored to flight in 2024, the aircraft will be used by the Sandy Gunn Aerospace Careers Programme to promote engineering careers and inspire future generations into the aerospace industry.

GKN has been a UK industrial champion for more than 260 years and during the 1930s and 1940s, 1,000 Spitfires rolled off its Hadley Castle production line, near Telford. It also made Spitfire components at its East Cowes facility, just seven miles from Sandown Airport on the Isle of Wight, where Spitfire AA810 is being restored today. GKN Aerospace's £500,000 donation will support the restoration of its fuselage structure, as well as the wing spars, leading edges and the wing ribs. GKN Aerospace apprentices in Bristol and the Isle of Wight will also be directly involved in the project, working on the machined components of the storied aircraft.

Spitfire AA810 Restoration Ltd was launched in 2018 with the aim of returning Alastair 'Sandy' Gunn's historic aircraft to flight. The associated charitable education arm, the Sandy Gunn Aerospace Careers Programme (ACP), was launched a year later in 2019, just before the Covid-19 pandemic hit. This year, the education programme will reach out to almost 100 schools around the UK via a series of roadshows and presentations. With the support of digital education platforms and the launch of a new careers network aimed at bringing students and industry face-to-face, the outreach programme will reach more than 500,000 young people by the end of 2023.

John Pritchard, president of civil airframe for GKN Aerospace, says: "GKN Aerospace's history is entwined with this remarkable story, having originally made components for this aircraft more than 80 years ago. We are extremely proud of our heritage and the pioneering spirit of our industry and Spitfire AA810 captures that perfectly. What excites me most, however, is what it can do for the future. With our own apprentices working on this aircraft, and through the charity's outreach to schools, we can inspire the next generation of aerospace engineers. By doing so, this restoration project can help us shape the future of flight."

Tony Hoskins and Dr Michael Smith, co-directors of Spitfire Restoration Ltd and co-trustees of the ACP: "Given their shared history, GKN Aerospace is the ideal partner in this iconic project and educational programme which, together, revives the past and inspires the future. We are delighted to welcome them to this exciting collaboration that we firmly believe will be extremely beneficial all round, from the young people concerned to the UK aerospace industry, economy and wider society."

Spitfire AA810 is known as Sandy's Spitfire, after its last pilot and engineer Alastair Sandy Gunn, who died in 1944. The charity operates in his name offering free engineering careers advice to school pupils all over the United Kingdom. Sandy's Spitfire is unique given its history and its role as a super long-range photographic aircraft during WWII. It also has the highest operational hours of any surviving Mk1 Spitfire and is the earliest surviving unarmed military reconnaissance aircraft in existence.

Once completed the aircraft will make a return flight to Norway and will attend air shows in Wanaka, New Zealand and Oshkosh, in the USA. The aircraft is expected to be based with the Shuttleworth Collection at Old Warden airfield, near Bedford, where it will be available to the public.

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FANUC offers free access to industry insight and success stories with new aerospace portal

FANUC's Aerospace Portal hosts all the information that specialists need in their search for efficient and risk-managed aerospace manufacturing solutions in one easy to navigate platform. It was launched internationally at the Farnborough Airshow in July.

Free to access, the FANUC Aerospace Portal enables users to research and investigate automation solutions by component, application, system integrator partner, supplier, or even particular engineering requirements. It also features a range of customer case studies, highlighting success stories in the aerospace industry.

"Given the sheer scale of the industry, even seasoned veterans may not be aware just how far automation and robotics have advanced in terms of meeting engineering requirements in a particular area," says Bob Struijk, vice president of European business development and managing director for FANUC Israel. "At the same time, our Aerospace Portal documents the proven track record of each technology and application, providing a vital combination of inspiration and reassurance through customer case studies and end-user success stories."

Optimised for use on tablets, FANUC's Aerospace Portal allows users to scroll their way through different options, fast-tracking the process of innovation and automation, while de-risking it with a support structure of application examples. Users can navigate through different functions, from machine tending and handling to laser cladding, or from carbon fibre lay-up to robot-based 3D printing or deburring and grinding. There is an explanation of each function and of applications within aerospace engineering. Those curious to know more can then follow prompts through to FANUC solutions or partner systems.

As the pioneers of numerical controls combined with the widest range of robots in the world, FANUC has one of the most comprehensive toolboxes within the aerospace sector. Now, for the first time, it is making this available to the wider industry, providing aerospace firms with a fast-tracked route to automation and helping to improve their manufacturing processes.

"All this is reflected in the applications offered by our industry partners," explains Oliver Selby, FANUC UK. "As well as our UK-based system integrators, the Portal features no fewer than 30 of our partners across Europe, but the platform's global perspective means there are no limits to its reach when it comes to process innovation and automation."

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Cost, cobots and connectivity: the 3 Cs behind the UK's acceleration towards automation

Despite our relatively small landmass, the UK is an economic overachiever, ranking as the fifth largest economy in the world. Linked to this is our success in manufacturing. We are the ninth largest manufacturing economy, the third largest aerospace manufacturer and our premium auto sector is one of the most powerful in the world. But concerns have been raised about our potential to retain our reputation as a manufacturing powerhouse, largely because of a chronic labour shortage and diminishing productivity rates

At the heart of this is our historic reluctance to automate. The UK currently ranks 24th in the world for robot density, with 101 robots per 10,000 workers. This is way below the global average of 126/10,000 employees and far less than Germany with 371. But as Tom Bouchier, managing director of robotics and automation specialist FANUC UK, explains, there has never been a better time for UK firms to invest in automation. Here, he outlines the key changes within the automation landscape that are prompting British firms to finally wake up to the benefits of automation.

Industry 4.0 means that all devices in the factory are becoming interconnected. An inevitable consequence of this is a trend towards standardisation of CNC applications across a range of manufacturing technologies

Skills shortage takes hold

Latest figures from the UK's Office for National Statistics (ONS) confirm that unemployment in Q1 of 2022 was around 3.8 percent, a record low. Some sectors are experiencing particular shortages; in May 2022, the Association of Labour Providers (ALP) reported that almost half, 49 percent, of British food growers have rationalised or reduced their output because of labour shortages. Monitoring firm Small Business Prices has reported some startling figures in manufacturing too. Mechanical engineering vacancies are 24.1 percent above average in the northwest and nearly 16 percent in London.

Long-term staffing pressures have been exacerbated by Brexit and the COVID pandemic, during the early part of which, in 2020, there were four unemployed people for every vacancy in the UK. The ratio is now 1:1, according to the Chartered Institute of Personnel and Development. Demand for workers has risen at a time when the supply of labour has been limited. And the reopening of the economy as the pandemic loosens has only made the situation even tighter.

Cobots are designed from the outset to be sensitive to the presence of people and FANUC expect cobots to automate tasks that have, until now, been difficult to roboticise

Automation is the answer

To remain competitive, industrial companies need to produce more goods, to higher quality, in less time. This is hard to achieve with human personnel alone, especially given the current skills shortage. The way to resolve these pressures is through automation; using robots to do the dirty, dull and dangerous jobs and freeing up workers to complete more value-added tasks.

Although the UK was slow to embrace the robotics revolution compared to many other industrialised nations, FANUC is now seeing a significant uplift in enquiries across the UK and Ireland and, especially, from SMEs who have not, historically, been major users of automation. Automation and roboticisation in UK manufacturing has been led by the automotive sector, concentrated within the OEMs and Tier 1 and Tier 2 suppliers. Further along the supply chain, reliance on human employees and manual workers has continued.

Overcoming the big hurdle

There are a number of reasons why UK manufacturers and employers, particularly SMEs, have been reluctant to invest as rapidly as their counterparts elsewhere in Europe and across the world: chief amongst these is cost. There is a perception that robots are expensive and this was undoubtedly true in the past, but as robots have become more agile, more flexible and more adaptable, their purchase price has dropped accordingly. The days of one large, bespoke, immovable robot, surrounded by heavy guarding, doing one standardised job over and over are gone. Today's automated solutions take up a smaller footprint, are lighter and can often be easily redeployed as business needs evolve to meet changing consumer demand, making them a lasting investment that can continue to add value for years to come.

Lifetime costs have come down too. FANUC actively works to design and develop robots that are energy efficient and durable, that operate reliably and cost-effectively for decades with minimal maintenance. To illustrate the cost-benefit ratio and payback timescale to UK manufacturers, it is developing a return on investment (ROI) calculator tool. Due to be released later this year, it will enable customers to input appropriate parameters including initial cost, speed of operation and load times and calculate the value of their investment in automation in clear, cash terms.

Cobots: flexible, agile and inexpensive

Chief among the new generation of flexible and adaptable robots being developed are collaborative robots, or cobots. These machines can be liberating for smaller companies and pretty much eliminate cost concerns. We expect to see more cobots working in factories of the future, automating tasks that have, until now, been difficult to roboticise.

Designed from the outset to be sensitive to the presence of people, cobots can be used in applications alongside humans. Depending on the application in question, the traditional expensive safety infrastructure associated with industrial robots is not always required. This, as well as their smaller footprint, helps to reduce their purchase price. Their ongoing lifetime costs are refreshingly low too. FANUC's CRX range of collaborative robots comes with a guarantee of eight years' maintenance-free operation.

Another key factor influencing manufacturers' decision to invest in cobots is their ease of setup. For example, developed in partnership with one of our integrator partners, Cyber-Weld Ltd, the CyberMate is a ready-to-use cobot welding system. Its plug-and-play operating system makes it a flexible, low-cost, high-value solution that can be rapidly reconfigured for the needs of SME operations.

Optimised for the digital age

Another factor helping to make automation a more attractive option than ever before is connectivity. Machine tools and robots are becoming more intelligent. Industry 4.0 means that all devices in the factory are interconnected. An inevitable consequence of this is a trend towards standardisation of CNC applications across a range of manufacturing technologies.

At the same time, availability of data from machines in operation, in real time, is helping to improve quality, reduce unscheduled stoppages and boost productivity. These things are in reach of even smaller companies.

Digital twinning is another trend that is proving beneficial to larger and smaller companies alike. Developed in conjunction with a physical system, the digital twin can help manufacturers that are looking to scale up, alter or enhance their production lines. By running a virtual version of any changes through the digital twin, they can have confidence that their automated system can handle them before investing in any new equipment, boosting uptime and eliminating the risk of ending up with a system that is not fit for purpose.

Although robots are constantly evolving and becoming more affordable, more accessible and more attractive, people will always be needed in factories. Where automation can really make a difference is in improving working conditions by taking over physically demanding, repetitive and hazardous tasks, leaving the human workers free to deploy their skills into more valuable areas and ensuring that the UK's legacy as a manufacturing powerhouse can continue to thrive.

Managing director of robotics and automation specialist Tom Bouchier, FANUC UK

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Turning automation myths into money-makers

Despite the notion that 'automation' is almost inflated today, there are lots of misconceptions around it. Supported by my personal experience from the UK market and Fastems' decades and thousands of systems long global history, I've summarised a couple of central myths popular in 2022. If they resonate with your CNC manufacturing, I hope I'm able to suggest there being ways out of these 'traps'.

"Automation steals jobs and runs lights out"

"The idea behind and reasons for flexible automation are obscure"

With traditional manufacturing methods and planning, large batches are needed to reduce downtime and setup time at the machines. This causes headaches due to high lead times, cost of storing parts, work-in-process and slower earnings. All these lead to less cashflow.

The question for both subcontract manufacturers and OEM's alike has always been how to work "just-in-time" yet maintain a low part cost. The problems include low machine utilisation, high setup time and labour-intensive operations. Due to this, only large companies that were able to invest in large amounts of machines were able to achieve just-in-time manufacturing with very low machine utilisation rates.

To understand what flexible automation is for, we need to understand exactly what it is. In ordinary terms, flexible automation means manufacturing only the required number of parts and just before the end user needs them, hence "just-in-time" and "flexible". In other words, it means manufacturing the right part at the right time.

Manufacturing Management Software (MMS), i.e. the control of a flexible manufacturing system, manages the production orders from ERP, makes a production resource check and schedules the whole production so that every single order will be ready on time. When a resource is missing, the operators are alerted in advance, the red circled jobs on the above schedule.

In the real world, this means sometimes producing an order of one or two parts with only a few days lead time. For this to be done economically we somehow need to shorten the setup time as well as streamline the whole process of manufacturing from door to door. How can this be achieved? At Fastems, we start everything with the software; from ability to schedule work dynamically and automatically, to fetching production orders automatically from the company's ERP software, all the way to having full part traceability at the end of the process. All of this is managed by visual dashboards showing all production resources required.

"But how exactly is this reducing the setup time?" you may ask. That is where the hardware comes in, either a robot arm or a linear stacker crane can be used to change the fixture of the machine automatically so that all the setups can be done ahead of time and stored until they are needed. All the part loading and unloading is done automatically as soon as the machine is ready. This removes all the downtime and waiting time and thus optimises the process in the high ninety percent of uptime. Therefore, the unit cost of producing one part is equal to producing ten, twenty or even one hundred.

"Our batch size is too small for automation"

There are two types of production to think about when looking at batch size:

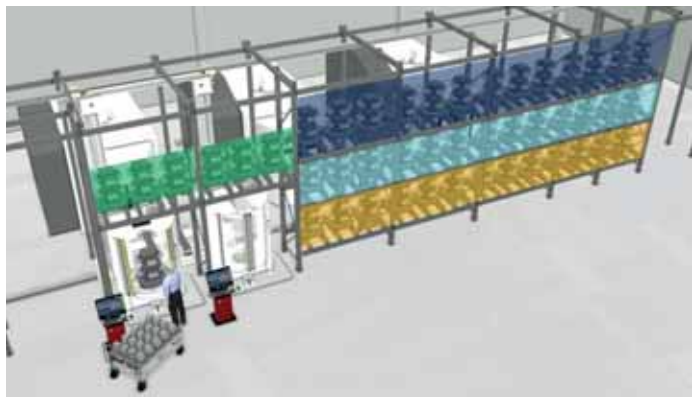
New parts

Traditionally, manufacturers set up a machine to run a batch of for example, 10 parts and as soon as the part is proven out and inspected, the machine can start making the actual customer order. This leaves a lot of waiting time between first off/prove out and end of the inspection. It also means that due to this, even with simple automation, for example, a gantry loader or small pallet pool cannot give the sufficient capability to run unmanned. With a flexible manufacturing system, however, it is possible to optimise the process so that all the first-off and prove-outs can be done during the time that operators are on site and the run-offs can be done during the unmanned period. This is reliable as the setup time is changed automatically and will not affect the machine uptime. To run so flexibly, either many pallets are needed or a robot loading the part to the pallets can be used to minimise the number of pallets and space needed in the cell.

Repeat orders

Due to a large number of pallets in the system, a pallet can be set up and left in the storage until needed and again, due to the setup time not affecting machine up time, the cost of producing one part is the same as that of producing one hundred parts. Zero-point fixtures can also be used on the pallet to store fixtures that are not often used away from the expensive machine tool pallets. As the setup, NC program and all information of an order is always stored within the software this means any workpiece that has ever been introduced to the system, can be rerun the same way, any time. All in all, it is a simple and quick task to call a repeat order, which can also be automated with an ERP interface.

Flexible manufacturing systems come in various sizes from automating a single machine tool to dozens of them. Since the system can store each production fixture, the needed NC programs and raw materials, FMS can start producing any previously run part with zero setup time.



"Large tool magazines on each machine are needed to enable automation"
This is the biggest myth in the automation industry. Would you believe us if we told you that 60-tool or even 30-tool magazines are sufficient? When the tool demand and consumption is high and machines are wanted to run flexibly, many machines able to run the same jobs, it is more economical to have a central tool storage system with a large capacity of 300 to 3,000 tools managed by one or a couple of robots, delivering the tools to the machines when they are needed. This is not only saving cost per machine but is also cost saving on the cutting tools, as less sister tools are needed and especially the large expensive tools can be shared across multiple machines. In some cases, large tools that couldn't fit in the machine's own tool magazine can be robot-loaded in the spindle, adding flexibility and versatility, not only to the automation but also to the machine tool.

Centralised tool storage system can accommodate up to 3,000 tools and share them between the machine tools. This reduces the need for large machine tool magazines and the amount of sister tools significantly not to mention the ability to run a machining job without reserving every single needed tool for the whole time.

"Fixture cost is very high in flexible manufacturing systems"
Machine tool pallets and fixtures are expensive. There is no denying it. However, using a auto-loading robot, the pallets can be loaded and unloaded automatically, radically reducing the number of pallets needed to run long, unmanned periods. Another myth is that robot loading pallets are not flexible due to the pneumatic or hydraulic fixtures. This can in fact all be resolved by using a robotic driven tool called Nutrunner. The screw of a mechanical manual fixture can be actuated with the robot. This means that no modification to the pallets, machines or fixtures are needed for the cell to be loading automatically, which ultimately saves cost, time and floor space while not requiring any process changes.

Traditionally the fixtures are loaded into flexible manufacturing system by the operator. When the production mix is high and number of fixtures and storage places limited, an auto-loading robot can be of great help in order to extend the unmanned production capacity.

"Robotics are difficult to program and not suited for small batch or subcontract work"
A lot of people think that resorting to using collaborative robots, i.e. cobots, for tending CNC machines is the answer. However, cobots are difficult to integrate safely into the machining environment as the machine itself is not collaborative. The size, shape, payload and speed needed for loading and unloading a metal cutting machine tool are mostly not suited to cobots. Therefore, we have developed our software with the functionality that allows programming the robot to different parts without the need for robot programming experience or extensive use of the robots pendent. This feature, together with the robot's ability to use our own design of flexible robot grippers, which can auto-change the size of the part that they are handling or be able to completely change the gripper when needed, prove that full flexibility can be achieved. When coupled to a vertical storage system the robot can be fed constant work without the need for interruption or a large footprint as all the finished parts and the raw material is stored vertically.

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Lathe tending system modified to extend unattended production

Compact robotic systems from Halter CNC Automation, Holland, are ideally suited to loading and unloading CNC machine tools, as family business Armbruster GmbH in Steinach, southwest Germany reports. The same machine tending technology is available in the UK market through Salisbury-based 1st Machine Tool Accessories.

Armbruster employs about 130 staff and specialises in manufacturing complex, high quality products such as surgical instruments and implants for the medical sector. It also provides subcontract machining services to a broad range of industries.

Production ranges from turning, milling and electric discharge machining to surface treatment and assembly. Demanding workpieces in stainless steel, titanium, high-performance plastics and special materials are processed in batch sizes from 1 to 1,000 in the modern, 2,500 sq m factory.

Florian Schätzle, team leader for machining support at Armbruster says: "We have been committed to automation for a long time. The milling section is fully automated, although the eroding area is only partially autonomous.

"As regards turning and turn-milling, most production is automated by bar magazines but traditionally we load and unload billets manually for chuck-type work.

"We therefore decided to invest in a billet loading and unloading robot from Halter, a Universal Premium 35, which was installed in the summer of 2021 to tend an existing Mazak Integrex i200 chucking lathe on the shop floor."

The turn-mill centre with B-axis produces stainless steel flanges as well as longer components. Billets are from 70 to 220 mm in diameter and from 30 to 70 mm long, while multiple parts are sometimes produced from shaft-type material up to 450 mm in length.

Sebastian Ringwald, team leader for turning says: "The HALTER Universal Premium is ideal for handling billets in this size range. The versatile robot cell is designed for automated loading and unloading of rotationally symmetrical or rectangular workpieces as well as long shafts."

A variety of workpiece grippers is available for this purpose and grid plates of various capacities act as buffer storage for parts. The robot can be equipped with a double gripper to remove a finished part and load a new billet into the spindle in a single visit to the working area. Raw material can be replenished by an operator at the rear of the cell so that production is not interrupted.

For billets up to 80 mm diameter, a maximum of 34 blanks and finish-machined workpieces can be accommodated on two sides of the original grid plate, making a total of 68 workpiece positions. For 250 mm diameter parts, however, the capacity of the buffer storage was six finish-machined workpieces, with billets loaded into the Integrex chuck manually.

Machining cycle times for these larger

parts are between 60 and 150 minutes, which meant that long periods of production with minimal operator attendance would be possible in three-shift operation if a way could be found to load the larger billets automatically. Armbruster addressed this by producing additional customised grid plates to extend the storage capacity within the robotic cell.

Sebastian Ringwald confirms: "Halter adapted the robot programming for the increased parts handling. It was done quickly without any problems. The supplier is always open to our proposals and implement them in such a way that they are practical to use."

The new solution made it possible to increase the number of workpieces of more than 200 mm diameter in the buffer of the robot cell from six parts previously to an additional 16 parts, i.e. a total of 22. Longer shafts from which several individual parts are machined may be similarly accommodated, enabling even longer periods of unattended production. One of the central goals was to make material available to the lathe for an entire weekend so that it is able to continue working from Saturday afternoon until the start of the first shift on Monday morning.

Florian Schätzle comments: "We generally plan production in such a way that machines run throughout the weekend. In the past this was a problem with chuckers, but the HALTER Universal Premium is able to solve that problem.

"Our experience so far with the automation solution has been positive. Our staff realise that the robot cell enables them to organise their working hours better, for example for quality control of finished parts, without having to be present at the Mazak every minute to avoid machine downtime."

He added that Armbruster's production management team had to invest time in process planning to take account of the longer periods of autonomous running, for example with regard to the service life of tools to avoid stoppages. Swarf accumulation is another issue, which is why the gripper and the workpiece are cleaned automatically with high-pressure coolant after each cycle.

Florian Schätzle concludes: "All our efforts have paid off. We have been surprised at how well everything works and are very satisfied with the end result."

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Mazak introduces the powerful and appealing VCE-600

Designed and built in the UK, the new Mazak VCE-600 vertical machining centre is an exciting new 3-axis VMC with an impressive specification and appealing price-point. The impressive next generation machining centre presents an attractive proposition for a wide scope of manufacturers from job shops and small subcontractors through to OEMs.

The result of extensive market research, the new cost-effective VCE-600 incorporates a variety of features and new technologies that demonstrate leading productivity, performance and ease-of-use that is delivered in a compact footprint with quality and service that is assured by the Mazak brand. Despite the compact 2.9 by 3.12 by 3.14 m footprint that will appeal to manufacturers with a limited floor area, the VCE-600 has a generous 1.3 m by 600 mm table with X-, Y- and Z-axis travel of 1,050 by 600 by 600 mm. This permits the machining of particularly large components, especially in the Y-axis stroke.

Travelling above this work area is a 12,000 rpm 18.5 kW dual winding spindle with 119.4 Nm of torque that provides everything a subcontract machine shop requires. At the low-winding speed range, the spindle provides exceptional torque for heavy-duty milling and drilling. At high speed, the spindle generates a high-power output at high speed for machining lightweight materials and profiling parts. The 7/24 No40 spindle with through coolant is supplied with cutting tools by a 1.9 second tool-to-tool quick-change 24 position ATC that can accommodate a maximum tool diameter of 75 mm. To improve operator access to the ATC, an optional ATC door can be specified to reduce setup times.

As well as a class-leading spindle, the new VCE-600 demonstrates its build quality with extremely rigid linear roller guides on all axes that underpin the machine's ability to perform both heavy-duty cutting as well as high-speed machining. This is complemented by direct drive servo motors on all axes and fully ground pre-tensioned ball screws that provide unparalleled levels of precision and repeatability.

Commenting upon the exciting new arrival to the Mazak stable, European group product manager, Mark Hall says: "The new VCE-600 is the first in a new range of very exciting vertical machining centres that will generate a lot of interest from the industry. The reason for this is the specification touches a lot of applications and at the same time, it offers performance and value. One of the great things the industry will like about this machine is its versatility. It has a large work envelope, a class-leading spindle and the new SmoothEz CNC control that is fast to programme. This makes it great for operators. This new machine is going to be great for subcontractors, entry-level businesses and anybody that has a variety of workpieces, as the specification means the VCE-600 can cope with everything the industry throws at it."

To simplify ease-of-use and reduce setup times, Mazak has incorporated several design features that are both practical and ergonomically friendly for the operator. For example, the VCE-600 has been designed with a single large sliding door with a large window. This large window provides outstanding operator visibility during machining whilst the easy-open door enables operators to load and unload parts and tools with one hand while opening the door with the other hand. While finite attention to detail has been paid to the operator's ease-of-use and ability to reduce setup times, nowhere is this more evident than on the new Mazatrol SmoothEZ CNC control system.

The new Mazatrol SmoothEz CNC control system has an intuitive 15 inch touch screen display that can offer 'Ez Operation' with its ability to be operated like a smartphone or tablet where the display can be customised with the positioning of data easily adapted to suit the user. By customising the display, data can be checked and edited by the operator with minimum screen transition.

For 'Ez Machining', the Mazatrol SmoothEz allows customers to use the Mazak Mazatrol interface to create, check and edit programmes via a 3D model of the workpiece or alternately use full EIA/ISO functionality for G-Code programming offering users the utmost in flexibility.

Added to this, the SmoothEz offers 'Ez Setup' where all manufacturing data, such as programs, fixture setup, machine models, tooling data and coordinate systems, can be synchronised by Smooth Project Manager to SmoothCAM Ai. Referring to the SmoothEz, Mark Hall says: "For manufacturers with high mix and low-volume component production, it is critical that we cut down setup times. This is where the SmoothEz performs with several easy-to-use features that make it easy to move from part setup to production."

With automation increasingly commonplace on the shop floor, Mazak has designed the VCE-600 with the facility to integrate front, left or right-side loading doors for robot access. Optional tool and workpiece measurement systems, such as the Renishaw RTS and RMP60 touch probe, can be integrated. As would be expected from a leading brand like Mazak, there is an abundance of optional extras to meet the exact needs of the end-user.

This includes a 30 or 48 position ATC,

a selection of tool measurement, setting and breakage detection packages, swarf and coolant management packages that include flood, bed wash, air blast and also spiral and chip conveyors, plus essential automation options such as automatic door opening, robot interface and hydraulic or pneumatic fixture preparation. The machine can also be specified with 4th axis units to provide additional flexibility.

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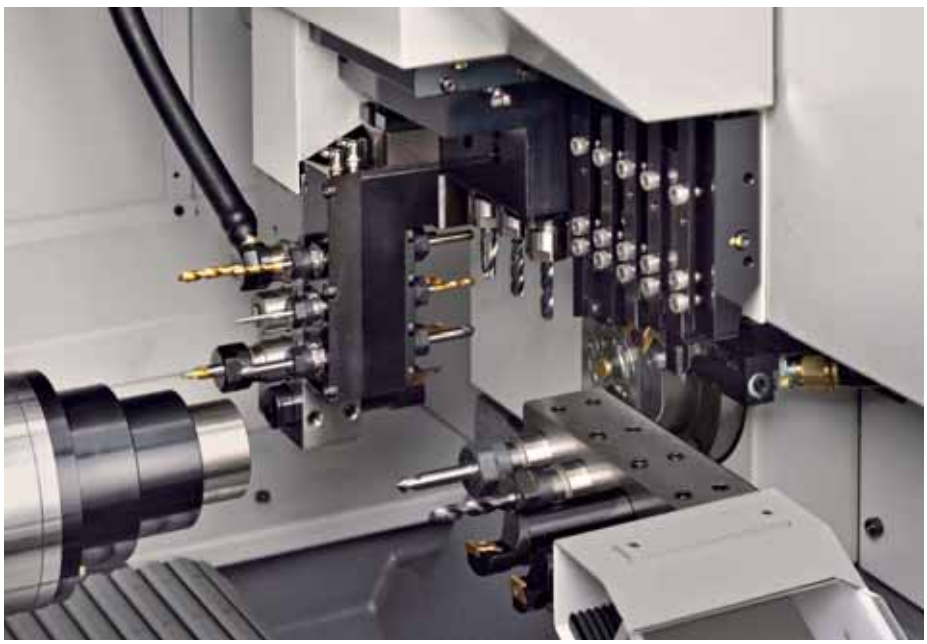
Manufacturer buys sliding-head lathes but machines components without the guide bush

Top quality brass lampholder manufacturer S Lilley & Son Ltd, now in its sixth generation of family ownership, has nearly finished phasing out the 20 or so cam-type, single-spindle bar autos it has used in its Birmingham factory since the 1950s. In their place are to be found 11 modern CNC, twin-spindle, bar-fed lathes up to 65 mm capacity with driven tooling, six of them supplied by Citizen Machinery UK.

Two are Miyano BNA42-MSY fixed-head turning centres of 42 mm capacity installed in 2017 and 2021, while the other four are Cincom sliding-head models, sliders, two for turning, milling and drilling 32 mm bar and two for processing 20 mm stock. Interestingly, to achieve the high speed of production for which outdated cam technology is renowned and couple it with the inherent advantages of CNC technology, namely unattended running and rapid changeover for smaller economical batch sizes, the company operates the sliding-head machines almost exclusively without the guide bush in place.

The reason S Lilley & Son Ltd is able to do this is that most components for the light fittings it makes are shorter than 3.5 times their diameter (3.5D). Normally a ratio of 2.5D is approximately the limit when stock is not supported in a bushing, or by another means such as a tailstock or sub spindle, otherwise the protruding length of bar deflects under pressure from the tool, causing inaccuracy during machining. However, the relatively open tolerances of the lampholder parts produced in Birmingham allows the company to push the limit higher, lowering the cost of manufacturing parts up to 40 percent longer by taking advantage of higher speed production without the guide bush.

The rationale for investing in sliding-head lathes and choosing to operate them without the guide bush for most of the time, rather than buying a fixed-head lathe, is due to the sheer speed of production that is possible using the in-line ganged cutters typically found in a sliding-head machine. It allows the linear cross slide to effect very fast tool changes between cuts. Cycles



times are considerably shorter and sometimes even halved compared with using a fixed-head turning centre.

Due to the bar being clamped by a collet closer to the spindle nose on a slider when it is used without the guide bush, Z-axis stroke is restricted to around one quarter of what is possible when stock slides through a bushing. It is because the whole spindle head rather than just the bar moves in and out of the working area to present the part to platen-mounted tools that can only move in X and Y.

As the collet grips the bar much nearer the work than in classical sliding-head turning, the more rigid clamping allows deeper cuts to be taken without chatter, resulting in further efficiency gains as well as better surface finishes, even when machining demanding materials.

Guide bush-less operation on a slider brings with it numerous other advantages in addition to all the productivity benefits. Bar of lower dimensional quality and price can be tolerated, as there is no bush for it to seize in. The remnant after the last part has been machined from a bar is around one-third the length left after true sliding-head turning, so there is less material wastage. It can equate to a considerable monetary saving, especially when prices are as high as they are presently, the more so when expensive alloys are being processed.

Indeed, if support is not necessary for the stability of a part during machining, it is better to remove the guide bush as it can actually compromise accuracy. Holding roundness then becomes easier on short components, as the ability to achieve tolerance is dictated by the high quality spindle rather than the bushing.

S Lilley & Son Ltd's transition from

cam-type to CNC lathes started in 2008, somewhat later than in many manufacturing companies for three reasons. First, as tolerances on its electrical products are not particularly tight, their production is relatively unaffected by the age of a machine tool; second, the fittings are frequently needed in large volumes commensurate with single-spindle cam auto operation; and third, the company was fortunate to employ a highly skilled cam auto setter-operator who retired as recently as 2019. That was when the penultimate cam-controlled machine was sold, the single remaining auto being devoted to a particular long-running job.

The employee's departure was the trigger for the Lilley family to accelerate the purchase of Cincom sliders. A pair of 20 mm capacity A20-VII models was installed, one in 2019 and another in 2020, as direct, more productive replacements for the former single-spindle cam autos.

The new sliders joined an L32 Cincom model installed in 2012 for producing parts up to 32 mm diameter. The machine was swapped in 2017 for a more modern L32-XII. Likewise, this slider is only occasionally used

with the guide bush fitted for producing some longer components from bar or tube.

Director Simon Lilley is of the opinion that, even though cam-type lathes can produce more components per hour than their CNC counterparts, the ability to set the latter machines so much more quickly and run them unattended through the night during the week and into a ghost shift on Saturday mornings means that in terms of production output, one Cincom is able to do the work of three of the older single-spindle cam autos.

He described as "a massive advantage" the ability to produce long runs of components on the CNC machines without an operator in attendance, for example 100,000 Lilley hexagonal lock nuts. During the daytime the sliders are ideal for producing smaller quantities of say 500-off, whereas cam-type lathes would need to be set to run a minimum of 10,000-off to be economical and in any case most of this type of work has long since disappeared overseas. Being able to reduce economical batch size so substantially, down to about 100-off, has resulted in substantial savings in inventory and space and the cost of holding large stocks.

In January 2022 a fourth Cincom arrived, an L32-XIILFV with Citizen's latest low frequency vibration (LFV) chip breaking technology in the Mitsubishi control. The three existing sliders plus the Miyanos and other fixed-head lathes were approaching full capacity, so the new machine provided flexibility to swap work around on the shop floor and it is also back-up for the remaining, ageing single-spindle cam auto.

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Sodick die-sink EDM investment meets demand from renewable energy sector

A leading company in toolmaking, injection moulding and presswork has invested in its second new Sodick die-sink EDM in the past two years, this time to help fulfil the requirements of a customer in the renewable energy sector. Belfast-based Crossen Engineering has already used its new Sodick AD55L spark erosion machine from Sodi-Tech EDM to make the mould set for an inlet manifold that helps produce solar thermal panels from a proprietary polymer material.

With a history that dates back 44 years, Crossen Engineering provides its customers with a single-source solution that embraces everything from part design and prototyping to production components. In recent years, the company has been busy diversifying into new markets. For instance, in December 2020, a new Sodick AD35L arrived that helped to accelerate growth in the medical market for this ISO9001 accredited company. With the prospect of securing work for another new industry, renewable energy, the company turned again to Sodi-Tech EDM.

"As well as the Sodick AD35L die-sink EDM we bought in December 2020, we had another older Sodick spark eroder on site, a Mould Maker model, which we retained as our back-up machine if we received an influx of sparking work," explains business development manager Peter Crossen. "We took the decision to replace that machine with a Sodick AD55L and its far newer technology. The machine will not be a back-up but will run alongside the AD35L to provide a permanent capacity boost."

While the company's existing AD35L has travel of 350 x 250 x 270 mm in the X-, Y- and Z-axis respectively, as well as a 600 x 400 mm table, the new AD55L takes the travel range to 600 x 400 x 400 mm, while the ceramic table measures 750 x 550 mm.

"The bigger bed allows us to take advantage of two-vice setups, while the machine also has more tool-changing capabilities, so we have more options for the setup of tools or electrodes," says Peter Crossen. "We bought the AD35L at the end of 2020 to meet demand for medical mould/press tools, which continues to this day. Word has got out regarding this machine and we are now quoting for more medical projects. However, it was a contract for the renewable energy sector that prompted our investment in the AD55L."

This work involved the manufacture of a mould tool for a manifold inlet that is part of solar thermal panels made from a proprietary polymer material which represents a real advance for the renewable energy sector. Suitable for all types of property, residential, commercial and industrial, the panels claim to lower cost, enhance durability and reduce carbon footprint more than other products on the market. As well as using the Sodick AD55L to make the mould tool set for the manifold inlet, Crossen Engineering also manufactures the parts on site using its

repertoire of injection moulding machines, which extend from 30T to 800T in capacity for parts from 1g to 4.5 kg in weight.

"There were specific elements of the manifold inlet mould that needed the larger table, which is why we selected that particular Sodick model in the first place," says Peter Crossen. "Moving forward we anticipate continuing producing the manifold inlet mouldings and to get involved with further projects for this client that will undoubtedly require our new AD55L."

He adds that the company did not even consider going anywhere else than Sodi-Tech EDM for its new machine: "It was always going to be another Sodick, because of all the benefits that these machines bring," he states. "We also have a Sodick wire EDM on site, so familiarity with the brand is advantageous across our tool-room staff. They can hop between the two die-sink machines and the wire EDM, with no problem. Furthermore, from a support perspective, Sodi-Tech EDM has been great with us from the outset. The AD55L arrived at the end of March 2022 and we were up and running the same week."

Although Crossen Engineering uses its Sodick machines predominantly for mould tools, the company also leverages the advanced technology to produce press tools for its range of presses, which offer capacity up to 800T. This activity is growing for sectors such as material handling and construction which, in turn, is driving up turnover. However, the business climate remains challenging.

"With prices rising fast for electricity and raw materials, our investment in modern, energy-efficient machine tools is critical to offsetting some of these costs," says Peter Crossen. "The new Sodick machines are phenomenal in terms of speed, multi tool-changer setups, accuracy and energy efficiency. We are dead set on investing in machines like this across our business, from tooling manufacture to production."

The company has a robust flow of work lined up for the months ahead, where ongoing diversification into new sectors will continue as a core business strategy. Renewable energy is the latest success story to emerge from this approach, not just regarding the solar thermal panel project, but in the electric vehicle market, where Crossen Engineering is currently exploring the opportunities for pressings.

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NHP 5500 horizontal machining centre

Mills CNC, the exclusive distributor of DN Solutions' machine tools in the UK and Ireland, has introduced a new, 'next-generation' high-productivity horizontal machining centre into the market.

The new twin pallet NHP 5500 represents a significant upgrade on its predecessor and boasts faster acceleration/deceleration rates, improved tool change times, enhanced thermal compensation and faster B-axis table rotation.

The NHP 5500 features fast acceleration/deceleration rates which, combined with its impressive 60 m/min rapid rates, deliver faster processing speeds and a reduction in non-cutting times. This is essential in ensuring higher productivity and process efficiency.

The focus on improving productivity is also evident with the machine's faster tool change times. It comes equipped with a generous sized servo-driven ATC, from 40 up to 376 tools depending on the tool magazine selected. Tool change times are 1.7 seconds (T-T-T) and 4.7 seconds (C-T-C).

The NHP 5500 is equipped with a built-in 37 kW/10,000 rpm (BT50) spindle with integrated smart thermal compensation sensor technology.

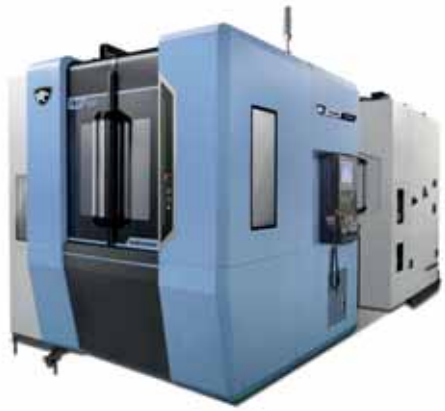
This, combined with the machine's advanced spindle cooling system, reduces thermal displacement and ensures that high part accuracies and repeatability's are achieved even during heavy-duty machining and long periods of operation.

The NHP 5500 has a rotary shuttle-type twin pallet configuration with a pallet change time of 12 seconds. This, in addition to fast B-axis indexing capabilities, 1.1 seconds for 90 degrees, and 1.5 seconds for 180 degrees, enables customers to achieve higher productivity.

The integration of a cone air blower that injects high pressure air into the location cones that connect the pallet to the table, removes chips from surfaces resulting in accurate pallet positioning and improved process reliability.

The hallmark of all DN Solutions' horizontal machining centres is their rigid design and build and the new NHP 5500 is no exception.

The machine features a heavy-duty 3-point support cast iron bed structure that, in addition to roller-type LM guideways, provides improved stability and is a necessary prerequisite for improved part accuracies, fast processing speeds and process optimisation.



Although the NHP 5500 is equipped with two pallets, 500 mm x 500 mm, the machine's productivity potential can be increased further through the integration of either a DN Solutions', designed and built, Round Pallet, RPS 5500, or a Linear Pallet, LPS 5500 automation system.

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Superiority of EDM control system convinces mouldmaker to standardise on Makino

Established over 30 years ago, mouldmaker BM Injection operates from a 10,000 sq ft manufacturing facility in Whitchurch, Hampshire. Out of every ten moulds produced, eight are used for on-site production of injection moulded plastic products for numerous sectors including aerospace, automotive, domestic appliance, sports, safety, optics and transportation.

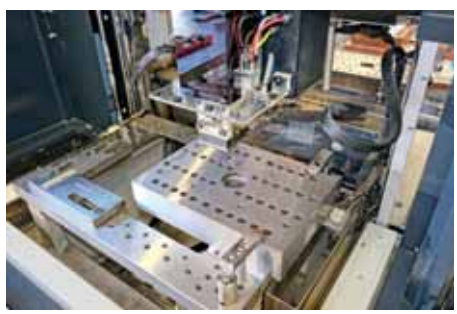
Before it is complete and ready for use, every mould has to visit both a die-sink and a wire-cut electric discharge machine (EDM) as well as a machining centre for hard milling. The proportion of time spent on each machine varies. In the production of BM Injection's mould tools, unless any are hard-milled on an Okuma 3-axis machining centre on-site, all three production platforms used for manufacturing the moulds were built by Makino in Japan and supplied through sole UK agent NCMT.

Latest to be installed in May 2022 was a U32j wire EDM machine fitted with the same Hyper-i control system as a Makino EDAF3 H.E.A.T. EDM die-sinker that arrived in 2019, at the same time as a Makino D200Z 5-axis machining centre from the same Japanese source.

The Hyper-i Windows-based, twin-touch-screen CNC system, with an intuitive interface similar to that found on tablets and smartphones, includes advanced functions to support operators of all skill levels at every step of the machining process. The control contains an extensive library of cutting conditions that automatically optimises the erosion process, even for sealed and poor flush applications. It also enables easy access to and selection of power settings to produce accurate results in the fastest possible cycle times.

The control employs HyperCut technology, a process developed by Makino to produce surface finishes as fine as 3 µm Rz in standard tool steels in a three- or four-pass process. The machine ordered by Mark Combes, a director of BM Injection, was a high-accuracy package with 0.05 µm scale feedback capable of producing extremely smooth surfaces down to 0.7 µm Ra if a seven pass process is adopted.

Mark Combes says: "With a wire machine it is all about producing sharp radii and smooth surfaces, especially on the interior of ejector pin holes. That is exactly what the U32j has produced right from the start due to a combination of rigid machine build, thermal stability and the Hyper-i control. We knew this software would deliver, as it proved fantastic on the EDAF3 sparker we installed three years ago."



Of particular note is the bidirectional HyperConnect Industry 4.0 network connectivity for remote machine monitoring and interlinking of all manufacturing information. This standard software allows access via the cloud to BM Injection's Open Mind OPTICAM wire EDM computer-aided manufacturing software. The CADCAM information occupies the top monitor of the twin-screen control and can be viewed and operated as if it were on-board, while Makino's process control screen occupies the lower monitor.

Another feature worthy of mention is the standard CRYSTAL II machining functionality built into the Hyper-i control, which is effective for machining shapes that are hard to polish while enhancing surface finish for improved mould release. It requires no special insulated jigs and is performed with uncoated wire, Bedra brass wire of 0.25 mm diameter with a high zinc content being the standard consumable at the Whitchurch facility.

The U32j is capable of utilising wire down to 0.07 mm diameter, however, smaller than most machines are able to accommodate. There will be a need for smaller gauges and the accompanying diamond guides for the future production of BM Injection's optical industry moulds. Mark Combes points to a reduction in wire consumption coupled with an increase in cutting speed on every job completed so far on the U32j compared with the nearly 20-year-old wire-cut EDM machine that was replaced.

Mark Combes concludes: "When the time came to install new, modern wire EDM technology, we looked at a number of options. We decided again in favour of the Makino offering not only because of the control and its synergy with our die-sink CNC system, but also due to the U32j's impressive working volume, 370 x 270 x 220 mm, for the footprint 2,580 × 3,165 mm. We get a very compact machine while gaining an extra 20 mm of travel in X, Y and Z."

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Two new 5-axis laser drilling machines

For rapid, efficient production of cooling air holes in gas turbine components such as guide vanes, blades, buckets, combustors and heat shields, DMG MORI has introduced the new LASERTEC 160 PowerDrill and its smaller counterpart, the LASERTEC 100 PowerDrill. Intended for manufacturers in the aerospace, power generation and other industries, the machines have a small footprint yet offer a large working envelope, making them ideal for companies that are short of space on the shop floor.

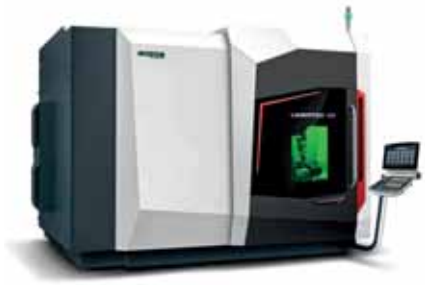
To meet the increasingly high accuracy requirements in the target industries, the new 5-axis drilling machines are based on a modular, moving-column design. The column moves in the X and Y axes, providing rigidity for high accuracy machining throughout the entire working volume. It is 1,600 x 1,000 x 1,000 mm for the larger model and 1,000 x 1,000 x 1,000 mm for the smaller, respective footprints being 14.7 sq m and 12.7 sq m.

A swivel axis for the tool and a rotary axis for the workpiece, or alternatively a swivelling rotary axis for the workpiece, together with different table variants, offer the right kinematics for every application, especially in bucket and combustor machining. Depending on the application, the machines are available with different space-saving fibre lasers rated at 9 kW to 23 kW, as well as in the PowerShape machine version for shaped-hole machining. With variable collimation, the laser's focus spot size can be changed during processing without manual intervention.

Linear drives in the X and Y axes, with acceleration of 7 m/s² and rapid traverse up to 90 m/min, ensure high dynamics. In combination with a newly developed laser control, up to 500 holes per second can be produced.

The machines have other advanced features such as shoot-through detection, capacitive distance sensors, water-cooled motors, linear guideways and ballscrews, an optional tool changer for different processing heads, automatic drill position detection and a camera integrated into the laser optics.

Lasersoft PowerDrill software, which was developed in-house and has proven itself



over many years, supports all jobs with a high level of user-friendliness and ease-of-programming. DMG MORI's proprietary, app-based interface CELOS and the powerful SIEMENS 840D solutionline control ensure ease-of-use and high process reliability.

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Ultra-precision machining within one-third of a micron

In the production of many optical components such as lenses and mirrors, the specified form accuracy and surface roughness are generally an order of magnitude higher than for other machining processes. That is why Son-x GmbH in Aachen, Germany, a spin-off from the famous local Fraunhofer Institute for Production Technology, uses a 5-axis machining centre built in Soltau by another German firm, Roeders. The manufacturer's machines are available in the UK and Ireland through sole agent Hurco Europe.

Son-x manufactures metal components made from various alloys, including high strength steels, as well as parts made of clear plastic. Quantities range from single pieces to several hundreds per year, while dimensions extend from a few millimetres up to half a metre diameter, for example in the case of metal mirrors. Sectors that use the components produced include optics, laser, sensor, astronomy and research.

Dr-Ing. Olaf Dambon, a director of Son-x advises: "Our early work involved ultra-high-precision diamond turning, but

parts started coming along that needed a prismatic machining platform able to achieve similar accuracies.

"We drew up a specification sheet for the machine we wanted and designed a challenging test part to ask prospective suppliers to produce. Five machining centre manufacturers were shortlisted, including three from Japan, but we chose the Roeders because its trial machining results were the best."

An order was therefore placed for a Roeders RXP 601 DSH 5-axis machining centre, which was delivered in October 2018. Dr-Ing. Benjamin Bulla, another director of Son-x comments: "In view of our high precision requirements, machine rigidity, smooth running and thermal stability were high on the list of priorities.

"The Roeders machine appears rather large at first glance for the size of work we undertake. However it was precisely this mass, as well as the measures taken by the manufacturer to ensure high precision machining, that meant it was the right choice for us."

With its Racecut functionality, the Roeders control system compares the actual and target positions in all axes 32,000 times every second, compensating for even the most minimal path deviations as they occur. Exceptional thermal stability is provided by a medium, temperature controlled to ± 0.02°C, circulating through all important components of the machine. The machine is equipped with a Levicron air bearing spindle capable of rotational speeds up to 60,000 rpm.

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New lathe chuck generation provides high power transmission

The variable machining of turned parts has never been easier. This is made possible with Duro-M, the new geared scroll chuck, innovative lens geometry and optimised power transmission by Röhm. The specialist for clamping devices and grippers, headquartered in Sontheim an der Brenz, Baden-Württemberg, Germany, provides its innovation by default in all diameters from Ø74 m to Ø1,250 mm with further sizes available on request. There is no limit with regard to the number of jaws as Röhm supplies its new lathe chuck generation across the whole range with two, three, four or six jaws. This way, even particularly thin-walled workpieces can be clamped and machined perfectly.

"The Duro-M is our new series of lathe chucks for the clamping of turned parts on turning and milling machines, rotary tables and dividing attachments with conventional clamps. We have the right Duro-M solution for every application, so that all metal workers can truly benefit from the many advantages of our new geometry,'' says Jörg Bauriedl, product manager for the manual lathe chuck division at Röhm.

The new Duro-M series from Röhm has a noticeable lens recess, which provides users with a whole host of benefits. Thanks to this significant recess, the lathe chuck becomes lighter. With its reduced weight, the Duro-M from Röhm goes easier on the bearings of the turning machine spindle compared to other lathe chucks and, at the same time, it enables acceleration with less demand for energy.

There is an added benefit with regard to the workspace, so that the machining tools are better accessible and for example drilling or milling operations on the turned parts near the clamping position can be much more flexible than before.

"As the milling cutters do not need to be unclamped as far, the risk of oscillations is reduced. Machining is safer and more precise and this enables higher cutting speeds," explains Jörg Bauriedl.

High power transmission

The new Duro-M series from Röhm impresses with an excellent power transmission, so that the maximum clamping force can be achieved with low expenditure of energy. For particularly quick and

precise alignment of the Duro-M series' lathe chucks with the machine spindle, they are equipped with a control edge. This enables the user to optimise concentricity using the dial gauge already during setup, saving time during commissioning of the machine.

Naturally, the legendary spiral ring from Röhm is also used for the Duro-M. It is drop-forged and highly hardened and tempered. On the outside of the chuck body, the Duro-M lathe chucks have a drip edge where the cooling water can drain off in a defined way. In another advantage for users, the steel carrier of the Duro-M is a one-piece design, which makes it very rigid and prevents chip accumulation.

Minimal interference contour

The Duro-M lathe chucks from Röhm have a minimal interference contour and have a high true-running accuracy already in the standard version. "We can meet specific customer requests here as required, and individually adapt the clamping assemblies such as chuck body, spiral ring and jaws to each other once again,'' says Jörg Bauriedl.

The new Duro-M series from Röhm is particularly versatile with regard to connections and can be mounted cylindrically, from the front and rear, as well as via short tapers, from the front, via camlock or bayonet, each meeting all ISO and DIN standards. The Duro-M lathe chucks are optionally also available with double jaw guide. The Duro-M is supplied complete with either a set of inside and outside jaws or reversible jaws in addition to the base jaws. The jaws are finish ground to fit the chuck at the factory.

"With the new Duro-M line, we have perfectly reworked and expanded our range and offer our customers precisely what they expect from a leading supplier. Innovative ideas which make daily tasks easier. This is exactly what our new generation of plane spiral chucks stands for and precisely what we stand for as a family business with our history going back over 100 years," Jörg Bauriedl concludes.

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Leader launches Adaptix Vice Jaws

Leader Chuck International used the GTMA's Manufacturing Solutions event held in mid-June, in Limerick, Eire, to launch the Norgren Adaptix Vice Jaws to attendees looking to improve productivity and eliminate waste from their machine shops and toolrooms.

The Adaptix Vice Jaws are a revolutionary new method of transforming the way any machinist holds and grips parts for milling. With sliding fingers, it can be adapted to any part geometry to provide the necessary clamping forces to hold workpieces and can radically reduce the time and cost involved in the design and development of vice jaws or bespoke fixturing.

Designed to be as robust as standard vice jaws with regards to high clamping forces, repeatability and toughness, Adaptix Vice Jaws offer more flexibility. The fingers adapt to the unique part shape to provide time and money savings, simplifying the process overall.

Managing director Mark Jones explains how Adaptix Vice Jaws can benefit almost any workshop: "For many, the challenge of securely holding shaped material requires vice jaws machined to match the workpiece geometry; whether it is a cast or forged billet, a pre-machined part for second Op, or even a component being repaired or reworked. Every production or workshop manager knows this takes time, to produce a CAD file or drawing, obtain the materials for the bespoke jaws and then machine them. All before you can start cutting the part and making money.

"With the Adaptix Vice Jaws you simply set the fingers against the workpiece and lock them in position. You can be cutting material within a few minutes compared to half a shift lost to producing machined bespoke jaws which improves productivity and there is no waste, as the Adaptix Vice Jaws can be reset time and time again to suit any job that comes in."

The centre fingers are locked and used to datum stop against the workpiece before the remaining fingers are simply positioned forward and locked in place with a side clamp. From a one-off part to a low volume batch run the Adaptix Vice Jaws can support any milling operation and there is no need to store boxes full of machined jaw inventory 'just in case' a job comes back again.

"Resetting the Adaptix Vice Jaws is so quick and easy it eliminates the need to hold jaw material stocks. Plus, the design of the Adaptix Vice Jaws allows increased cutting tool access as the fingers can be repositioned during the machining cycle, with the machine stopped, to provide clearance if it is required on certain locations. Which could possibly save an extra setup and operation," Mark Jones points out.

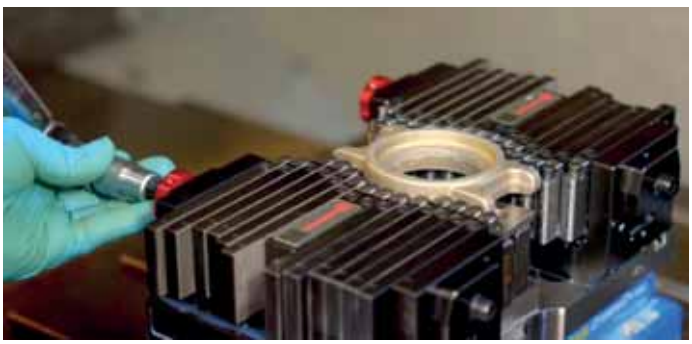
The exchangeable tips of each finger can be replaced if they are damaged or sacrificed during the milling operation. They are available in various materials, including aluminium, steel, plastic, brass and so on to facilitate clamping different shapes, step profiles and workpieces or components where the surface finish is a key characteristic, all with pinpoint accuracy and repeatability.

Leader Chuck International is so confident in the gains presented by the system that it is offering a free 30-day trial for any company that meets the product mix criteria and is currently producing soft jaws and wasting valuable machining time. "For any machining operation relying on profiled jaws the time, material and setup savings that can be made results in an ROI that will be measured in a matter of a few weeks. *Simply use the Adaptix Vice Jaws free for 30 days and then purchase or return them," says Mark Jones.

He continues: "Adaptix Vice Jaws are especially well suited to companies that have high product mix CNC production in low volumes, are in the rapid prototyping arena, manage assembly/bench deburring and run inspection processes. For all

manufacturing businesses in technically demanding sectors operating high-end CNC production equipment, such as expensive 3-axis CNC machines, where machine uptime and fast job turnaround is of the essence, this workholding solution is ideal.

"With the drive for businesses to reduce waste and maximise efficiency, as well as address the current raw material supply chain issues of exponentially increasing costs and scarce, inconsistent availability the Norgren Adaptix Vice Jaws provide an elegant solution to age-old problems and addresses all of these business performance goals."



Based in Tamworth and Co. Dublin, Ireland, Leader Chuck International has an enviable reputation for the in-house design and production of Leader chucking, stationary clamping, gripping and workholding products. A respected brand name for high quality equipment with more than 70 years' experience, the company also stocks products from the very best suppliers. It is proud to provide the best solution in workholding, tool holding and machine monitoring and loading. The company offers comprehensive, independent ranges of the highest quality, precision and reliability at competitive prices with reliable expert advice and a commitment to customer service.

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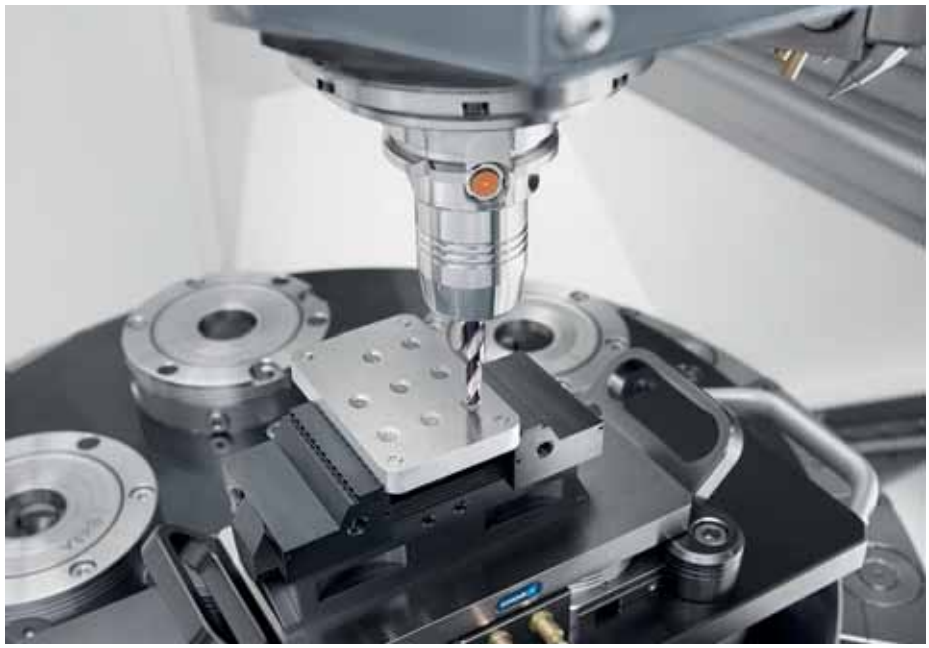
Digital and future-oriented metalworking

SCHUNK will be showcasing automation and digitalisation options for machining as well as new developments in the field of sustainable, resource-efficient clamping devices at AMB 2022 in **Hall 1 - Stand H30**.

Metalworking is in a state of great transition. The latent shortage of skilled workers together with supply chain problems, environmental aspects and the resulting changes in sales markets are placing new demands on the industry. Where the focus used to be exclusively on precision and time savings, flexible approaches are now required in order to be able to process small quantities or to change tasks in a cost-effective manner. At the exhibition in Stuttgart, SCHUNK will be demonstrating what has to be done to make metalworking processes more efficient, flexible and sustainable. Modularity, networking and automation capability have allowed the function-integrated clamping devices from the technology specialist to reach a whole new level.



The intelligent toolholder iTENDO² delivers data in real time for process-reliable machining, a longer tool service life and fewer rejects

Flexible machine loading and unloading

The company is now offering even more options in the field of automated machine loading. The TANDEM3 modular system for stationary use now has an additional component for flexible workpiece clamping with the new KRP3 centric clamping vice. With this powerhouse, even round workpieces can now be clamped automatically from the outside and inside in confined spaces. Like all stationary clamping devices from SCHUNK, it can be quickly and easily mounted on the VERO-S quick-change pallet system using console plates, which allows changes to be made as required. The clamping force block is also available in hydraulic (KRH), spring-loaded (KRF) and electric (KRE) versions. If you are still at the beginning of your journey and planning a cost-effective partial automation of your machine tool with a cobot, the new MTB application kits offer a convenient approach to automation. The grippers and power vises included are adapted for metal cutting machining and can be combined with robot-specific connections.

The flexible ROTA THW3 jaw quick-change chuck manages the balancing act between short setup times and low maintenance intervals

More process transparency

With its sensory modules, SCHUNK is now offering even more transparency in the clamping process. These modules provide the parameters of the clamping situation during operation. The SCHUNK portfolio includes, for example, the VERO-S NSE-S3 138 quick-change pallet module. Pallet presence and module clamped/opened can be permanently monitored, allowing users to always keep the overview of the process status. SCHUNK is now also offering additional monitoring options for the quick-change pallet modules from the NSE3 series. The new VERO-S AFS3 IOL sensor identifies the respective clamping status and reliably reports whether the modules are open or clamped. An inductive proximity sensor also indicates whether there is a pallet above the modules. This smart

interaction of the electronic monitoring system offers users more safety in automated workpiece clamping. Data is exchanged via the IO-Link interface.

Variety in workpiece clamping

SCHUNK is also looking forward to finally being able to demonstrate the unprecedented versatility and low-maintenance features of its manual chuck ROTA-M flex 2+2 live. The centrically compensating 4-jaw chuck has a long compensating stroke. Whether round, cubic or irregularly shaped, this allows countless workpiece geometries to be clamped on mill/turn centres with just one clamping device. Special seals ensure reliable clamping force and long maintenance intervals. This multi-talent for machining raw and finish-machined parts has been further developed and optimised. The new KSC3 manual clamping force block is corrosion-protected due to its nickel-plated base body, thereby providing longer process reliability in use. The even flatter design and a wide variety of jaws also offer more application options in the parts spectrum. Its encapsulated spindle as well as a preset cleaning position of the chuck jaws reduces the maintenance costs.

Awarded excellence and sustainability

In its product developments, SCHUNK focuses on approaches that save on resources and energy. The iF design award-winning ROTA THW3 jaw quick-change chuck manages the balancing act between short setup times and extremely long maintenance intervals. The developers of the lathe chuck have consistently reduced weight which reduces energy requirements and enables faster acceleration and braking of the machine. The sustainable sealing concept

The TANDEM3 modular system for stationary use now has an additional component for flexible workpiece clamping in automated machine loading with the new KRP3 centric clamping vice

ensures up to 10 times less lubricant consumption than comparable lathe chucks. The smart iTENDO² toolholder will also attract attention at AMB. It provides "closest to the part" data in real time and detects tool wear at an early stage. In addition to process-reliable machining, the intelligent toolholder ensures a longer tool service life and fewer rejects. SCHUNK now offers the toolholder, which received the German Innovation Award 2022, in a new variant iTENDO² easy connect with a simple data interface that can be used for machine and process monitoring.

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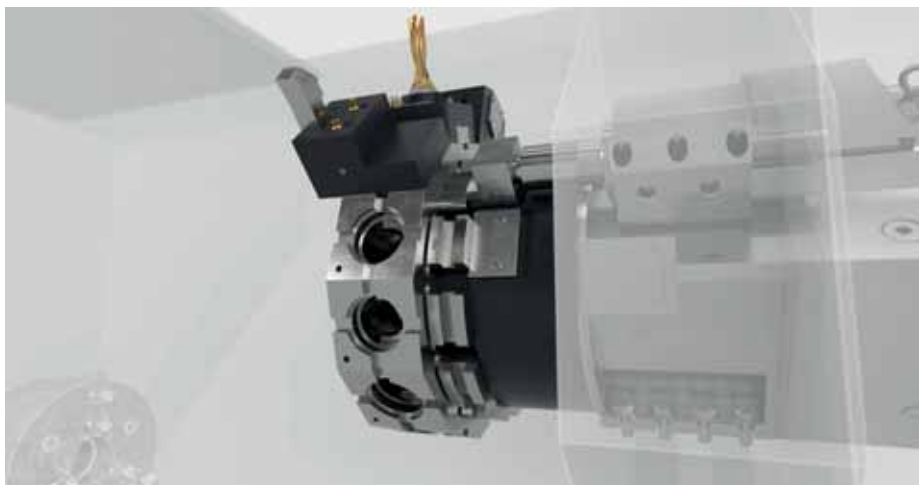
The whole world of metalworking right on your doorstep

Under the motto "System solutions around the machine tool", the Eppinger Group will be exhibiting at AMB. Its innovative QUICKLOCK tool clamping system will be showcased at the event. It allows toolholders to be clamped and released automatically in just a few seconds at the touch of a button. The Denkendorf-based company will also be showing its innovative toolholders and tool systems as well as rotary tables specially designed for precision machining on milling or grinding machines at its booth.

AMB is one of the most important national trade fairs with international appeal. Over 100 exhibiting companies from the metalworking industry will showcase proven know-how as well as plenty of innovations during five days of the trade show. "For us as a manufacturing specialist, AMB right on our doorstep is one of the most important events of all," emphasises managing director Uwe Eppinger. "Here we can showcase all of our expertise, both our nearly 100 years of experience in precision tooling for lathes and our role as a leader in the design and manufacture of toolholders for CNC turning and milling centres."



Tool change in less than four seconds

The highlight at the booth of the Denkendorf-based tool specialists will be the innovative QUICKLOCK tool clamping system. While the previous Fastlock changeover clamping system was already optimised in terms of setup time, with QUICKLOCK the tool change is now automated throughout and takes just a few seconds. According to the manufacturer, a push of a button is all it takes for QUICKLOCK to clamp or release the BMT tool holder in less than four seconds. As an optional 4.0 adaptation, the clamping system can also be operated by means of an industrial robot and the tool turret can thus be loaded fully automatically. Until now, several minutes have been needed for such a tool change, including loosening the screws and tightening them again with the torque wrench. With the previous approach, process reliability was not optimally guaranteed. "The setup time savings are enormous, so the innovative tool clamping system can be amortised after a very short time," says managing director Uwe Eppinger.

In addition to the new BMT tool clamping system QUICKLOCK, Eppinger will show a selection of fixed and driven too holders including the tool changing systems PRECI-FLEX®, PRECI-FLEX® T, DECOFLEX® and Eppinger PSC as well as toolholders that allow various special machining operations.

Moreover, the Denkendorf-based company will be exhibiting its newly developed CNC rotary tables. These can position quickly and precisely and are built extremely compact. The integrated closed-loop sensor system with dual drive allows high-precision positioning. This allows high and lasting accuracy even in a hard roughing operation. The rotary tables can be used both as original equipment and for retrofitting vertical and horizontal machine tools.

ESA Eppinger GmbH, part of the Eppinger Group, is a medium-sized, family-owned company based in Denkendorf, Baden-Württemberg. The company has been specialising in precision tools for lathes for almost 100 years and is a leader in the design and manufacture of toolholders for CNC turning and milling centres. Its product range includes fixed and driven toolholders and complete tool systems. In addition, Eppinger develops and produces gears for robots and automation as well as coaxial and angular servo gearboxes. Most recently, Eppinger newly developed smart rotary tables for high precision indexing to expand its product range.

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AMB: Hall 3 - Stand B40

Brown and Holmes provides solution for JCB

Brown and Holmes was approached by JCB Transmissions to support a project to increase its production. Due to a projected increase in manufacturing requirements, JCB identified the need to output more machined casings.

Brown and Holmes supported the original enquiry back in 2015 and supplied a set of hydraulic tombstone style fixtures. It provided the desired location strategy, support and clamping to maximise the production rates, all controlled by a fully sequenced hydraulic circuits housed within the fixtures.

JCB returned for the extension of this project as it knew Brown and Holmes would provide a repeat set of fixtures to the high standard and quality of the original project. The original fixtures are still in service, standing up to the rigorous machining strategies implemented by JCB.

The size of the fabrications, deep hole drilling and complex hydraulic circuits made for a challenging project the first time around. In addition, Brown and Holmes designed the main structures and supports to give additional access to the machined features. This gave JCB the opportunity to reduce the number of operations of the castings. This is a huge benefit and quickly offsets the investment in a project like this.

Brown and Holmes specialises in workholding solutions, subcontract machining and related products. Conveniently based in Tamworth in central England, it supplies customers across the world including UK, Europe, the Middle East, Asia and United States of America.

It has built an international reputation for quality workholding solutions, mechanical handling, precision machining and subcontract machining services as well as for the products it supplies.

Often working with customers to turn initial ideas and concepts into solutions, it offers a full turn-key service customised to meet requirements and budgets. The company has its own design team and specialist manufacturing sites and also works with customers' shop floor teams on their implementation across the globe while providing full technical backup, support and maintenance programmes.

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Manufacturing in the sub 5 µm range

Focusing on the production of components for machine tools as well as main spindles, SPL Präzisionsfertigung GmbH in Germany demands the utmost in precision. For this reason it invests in boring and tooling technology from BIG KAISER, which is available in the UK from Tamworth cutting tool specialists Industrial Tooling Corporation (ITC).

Andreas Pilz, the managing director of SPL Präzisionsfertigung GmbH, which was founded in 2007 says: "We started with just 14 workers and today we employ 30 highly skilled employees. We produce all manner of parts for turning, milling and grinding spindles as well as special spindles and test bench spindles."

The production of main spindles requires the utmost precision, accuracy and care so from the very beginning, SPL has regularly invested significant resources into employee training and state-of-the-art technology. In 2019, SPL took the decision to build a brand new, air-conditioned production hall, purchasing a high-precision machining centre from Hermle together with all the necessary tools and accessories. This investment enabled the company to stay on top of precision manufacturing, enabling the production of spindle housings, which are now an essential segment in its product portfolio.

Tolerances starting at just ≤ 0.005 mm

For the task of finish machining prismatic parts or spindle housings, SPL has also purchased a Hermle C62U 5-axis machining centre. "We made the decision to invest in a state-of-the-art machine and I remember writing to various machine manufacturers, but Hermle was the only supplier not discouraged by our demanding specifications and strict accuracy requirements." explains Andreas Pilz.

"This cutting-edge 5-axis milling machine meets the most stringent demands in terms of machine kinematics and positioning accuracies, which are necessary for our production in the ≤ 0.005 mm range," he adds. SPL utilises fine boring heads from BIG KAISER to ensure that the bearing bores in the spindle housings also meet their tight precision tolerances.

True partners for the highest precision requirements

"It was while machining a test workpiece at the headquarters of the machine manufacturer Hermle in Gosheim, that we first saw the fine boring heads from BIG KAISER in action. The quality of the bores was second to none and convinced us from the very outset that BIG KAISER was the optimal choice. We would not only be purchasing a high-precision tool but also gaining access to expert technical support and assistance from Jochen Renz, technical manager of customer service at BIG DAISHOWA, the sister company of BIG KAISER in Germany. This was extremely important for us, particularly concerning our strict parameters such as rotational speeds, cutting and feed rates," explains Andreas Pilz.

Digital fine boring heads

SPL relies heavily on the digital EWE fine boring heads from BIG KAISER. "The industrial components that SPL produces are very expensive. So, it makes logical sense to rely on the proven quality provided by BIG KAISER's digital fine boring heads. We would use them regardless, even if only to eliminate reading errors in the very tight tolerance ranges under which we operate," points out Enrico Müller, application engineer at BIG DAISHOWA.

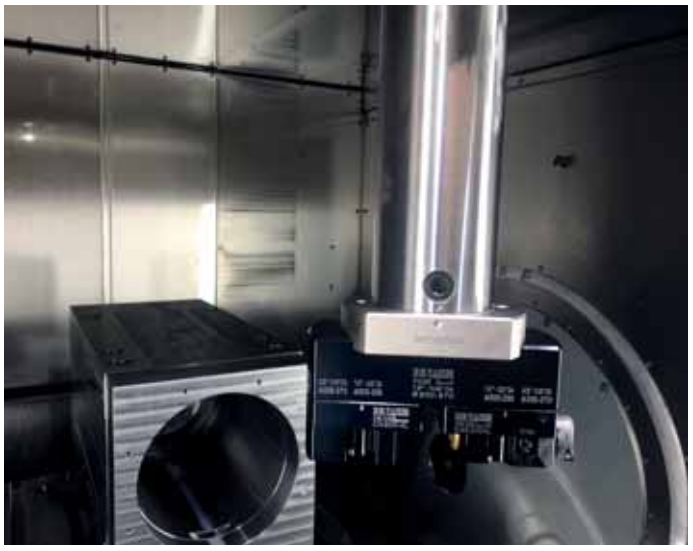
"Another advantage of digital fine boring heads is their ultra-fine handling accuracy. High-precision machining requires the utmost care and cleanliness. When manufacturing in the micron range, the machine, as well as the tool, must also ideally be in the micron range. In our situation it is a clear-cut case: no ifs, no buts, no room for compromise," states Andreas Pilz.

BIG KAISER has a modular system that covers all diameters and lengths. Fine boring heads can be adapted in a modular fashion to diameters and boring depths with various adaptations. The HSK-A 100 tool interface and the solid extensions provide high stability during spindling even at greater depths. Due to the system's vertical tool infeed design, errors caused by tool deflection are prevented and the achieved cylindrical shape of the bores is less than or equal to 0.005 mm.

Impressive bore lengths to 800 mm

The EWE fine boring heads feature high-precision insert holder

diameter adjustment. Since SPL spindle diameters range from Ø60 to Ø400 mm and bore lengths can reach up to 800mm, bridge tools from the 318 series are also used. The 318 series is suitable for various applications such as roughing, finishing, tenoning and face grooving. It is based on aluminium bridges of varying lengths that can be combined with a variety of aluminium and steel components for roughing and finishing configurations. The tool components are plugged onto the bridges at specific points and bolted in place. The precise positioning of the components on the bridges together with setting scales for the fine boring heads allows for fast and easy diameter setting.



80 percent time-saving in roughing operations

At SPL, BIG KAISER spindle tools are also used for roughing operations on an MTE milling machine. However, in this application, two cutting edges are utilised on the tool, not just one as is the case with finishing.

"Enrico Müller, who has worked together with us on the project from the very beginning, came up with the great idea, right on-site, that we could try roughing using a two-flute cutter on our MTE. As a result, our machining speed is now five times greater than before with the milling tool. This is important, we're talking about an 80 percent time improvement, not to mention a better surface finish and reduced costs," explains Andreas Pilz. Now, 15 fine boring heads from BIG KAISER are in use at SPL for fine boring of bearing bores and for roughing during re-boring.

A long-term successful partnership

"We could not be more satisfied with the results. The tools, the service as well as the advice are all top-notch. There is simply no other way to put it. Our industry places the highest possible demands on us in terms of precision, accuracy and quality.

Nevertheless, with the tools from BIG KAISER, coupled with their consulting competence and on-site support, success is practically guaranteed. In this case, we are also a little proud that we've earned our place in the ≤ 5µ range," concludes Andreas Pilz.

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Expansion at Hollingworth Design benefits from tooling input from CERATIZIT

Leaving regular employment in 2005 to start Hollingworth Design was a life affirming moment for Paul Hollingworth, who had just recovered from cancer at the time. After initially working from home and offering his extensive engineering design knowledge on a consultancy basis, it has now evolved into a multi-million pound business that continues to offer design consultancy. The company has also developed its own range of industrial compressed gas and vacuum systems, as well as expanding into subcontract machining.

Initially working from home, Paul Hollingworth gained a strong reputation for his design work and along with that came a demand for machining of prototype parts. This meant a move into machining, initially with two small machines housed in his shed. However, as demand grew, the need for a more formal set up became too much to ignore, so a move to a 4,000 ft^2 facility in Denton marked the next stage of development, along with the arrival of a turning centre and machining centre from XYZ Machine Tools. "We looked at the numbers and also the reluctance of other subcontractors to take on our work and having machining in-house was the logical conclusion," says Paul Hollingworth. Seeing further growth opportunities by having this machining capacity, it wasn't too long before further investment was made and the move into providing subcontract machining services blossomed. This resulted in a move to its present location, a brand new 12,000 ft^2 facility in Stockport.

Now at the heart of Hollingworth Design's subcontract capability are two Index bar-fed mill-turning centres, a G200-2 and a C100 machine. The capability of these machines, especially the G200-2 with its powerful B-axis and capability of simultaneous cutting with up to four tools, opened up many possibilities.

"Any job that can be machined from bar is classed as a turning job and goes on these machines, even if there is no actual turning involved," says Paul Hollingworth. Applying this philosophy allows cycle times to be drastically reduced, with help from cutting tool supplier CERATIZIT UK & Ireland. One particular component destined for use on superyachts benefitted from CERATIZIT's input. Initially a four-flute 6 mm diameter milling cutter was being used on these 303 stainless teel components. Following a recommendation from CERATIZIT technical sales engineer Matt Darbyshire, this was changed to a five flute Silverline solid carbide high-performance cutter from CERATIZIT's standard range. Running this cutter at 6,250 revs/min, 120m/min and 0.1 mm/rev feed rate with a 1.5 mm step down every rev, this cutter completed the entire batch of 4,000 components without being changed. "The performance of this cutter simply blew me away. We achieved a cycle time of 3.5 minutes per component, running the machine 24/7 and meeting all of our customer's expectations." This is a typical example of the approach that Hollingworth Design takes to look at every aspect of the job and engineer a process to make things better. To maximise the benefit for customers, it looks at batch quantities from 500 upwards and recently completed a single order for 72,000 components.

Machining these volumes demands support from CERATIZIT in the form of regular visits from Matt Derbyshire along with daily management of tooling through use of a CERATIZIT TOM 840 tool vending system.

"Our turnover has grown dramatically in recent years with subcontract machining accounting for around £150,000/month from our overall monthly turnover of £600,000/month," says Paul Hollingworth.

"Managing the tooling requirement for this level of work needed to be streamlined and where possible eliminate the last-minute verbal orders for tooling to comply with our ERP system and maintain 24-hour operation." Having the TOM 840 in place provides much greater flexibility for Hollingworth Design by having tooling available when needed and stock automatically re-ordered and restocked.

This comes without any requirement for in-house management time or added costs, with the tooling only invoiced for when it is used. The CERATIZIT TOM 840 unit is also supplied and installed free of charge to any customer meeting the minimum monthly spend of £3,000.

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Allied Machine releases M Geometry for T-A Pro Drill

New insert targets stainless and heat resistant super alloy materials

Allied Machine and Engineering, a leading manufacturer of holemaking and finishing tools for the metalcutting industry, has announced the launch of the T-A Pro M geometry insert. As the newest expansion of the T-A Pro high-penetration drilling system, this insert targets stainless steel and Heat Resistant Super Alloy (HRSA) materials. With the release of the ISO-material class M geometry and proprietary margin design paired with the development of the new AM460 coating, Allied Machine is able to provide a tool that offers low cutting forces, excellent penetration rates and long tool life in challenging stainless and heat resistant super alloys. The new insert geometry produces the best results with the newly designed T-A Pro holders but is also compatible with T-A holders and is offered in Z-3 series with diameters ranging from 11.10 mms-47.80 mms.

In industries such as aerospace, automotive, energy and food services that often machine stainless steel and HRSA materials, the cost-effectiveness and reliable performance of the M geometry insert are a necessity due to the high costs of these raw materials, which are among the highest in manufacturing. As the use of these materials continues to grow in many industries, improved drilling solutions like the M geometry target difficult-to-machine materials, a key factor in remaining competitive in any market.

Additionally, the design elements of the T-A Pro M geometry allow larger diameters, 25.4 mm and above, to be used on smaller or under-powered machines where additional setups on other machine tools would be needed or where parts would need to be contracted out. Machining components in-house and cost-effectively while meeting specifications every time ultimately increases throughput and profitability.

John Weniger, product manager, says: "In a material class where applications are known to bring unpredictable results, the new M geometry T-A Pro insert has been engineered to provide a winning combination of tool life, penetration rate and process reliability so that you can feel confident when applying the tool to your specific needs. The addition of the M geometry solidifies the T-A Pro line as a comprehensive, industry leading solution when it comes to holemaking."

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Tungaloy adds to DoFeed line

The DoFeed milling solutions have proven extremely successful for almost a decade and to build upon that reputation, Tungaloy UK has now launched the new AddDoFeed Series. Developed for high feed milling on small parts, the exciting new line exceeds the cost efficiencies and productivity benefits of the renowned DoFeed solutions.

Suitable for manufacturers in the mould & die, automotive, oil & gas and general engineering sectors, this impressive new milling family is certain to improve productivity for end-users. Solid carbide end mills have long been applied to milling small parts. However, it is unproductive to use these small diameter solid carbide end mills when requiring considerable stock removal on slotting or pocketing applications. This is because the low bending stiffness prevents the tool body from sustaining the heavy radial force generated when feed is increased to improve cycle times.

The new AddDoFeed uses small size 02 inserts with a 4 mm inscribed circle and offers close pitch cutter bodies that boast unrivalled insert-to-diameter density for a small diameter indexable cutter. The AddDoFeed small diameter high feed milling cutter series is offered in diameters of 8, 10, 12, 16, 20 and 25 mm. This allows the 16 mm diameter tool body to carry four inserts with five inserts on the 20 mm diameter tool and seven inserts on the 25 mm diameter tool body. This insert density enables users to ramp up feed rates and increase productivity. The tool bodies are available with a rigid short shank tool body, a long neck shank for reaching difficult to reach surfaces and also as a modular head system that is coupled with a tapered carbide shank for increased rigidity.

These tiny AddDoFeed 02 inserts carry all the key features that the DoFeed inserts have been delivering, including economical double-sided inserts with four effective cutting edges and optimal inclination on the cutting edge that enables smooth chip evacuation. The inserts also have a large positive rake angle that is suitable for light cutting and process security. All these features make AddDoFeed an extremely productive solution for machining small parts in various material groups.

When machining narrow grooves and small cavities, chip jamming and re-cutting are particular challenges. The inclination on the cutting edge of the AddDoFeed insert creates optimised chip formation that eliminates chip re-cutting and prolongs insert tool life. The AddDoFeed is available with three insert grades that cater for ISO materials P, M, K, S and H. The AH3225 incorporates nan multi-layered coating technology with increased resistance to wear, fracture, oxidation and built-up edges when machining steel, stainless and cast iron. The AH130 grade is a tough grade with high chipping and welding resistance that is suited to cutting stainless steel and titanium alloys. More of a universal grade, the AH8015 has a hard coating on a carbide substrate with a strong resistance to wear, heat and built-up edges. This demonstrates exceptional performance on steel, cast iron, superalloys and hard materials.

The new AddDoFeed products complement and empower Tungaloy's existing high feed milling concepts. The 21 new items of small-sized and close pitch cutters are now available in addition to the current DoFeed series of medium diameter cutter tools that are represented by Size 03 inserts and large diameter range with Size 06 inserts.

Since 1929, Tungaloy has been a pioneer in materials research and the development of cemented carbides. Tungaloy develops cutting-edge technologies by taking advantage of the latest techniques and equipment as well as its close relationship with customers worldwide in all industry sectors.

As a leader in the development of powder metallurgy and innovative coating technology for high-quality cutting tools, it has the experience, expertise and the latest equipment to ensure it remains a key company in the industry.

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InsertBox HighS from rose Plastic

Division manager

The insertBox HighS from rose plastic is among the world's most popular protective packaging solutions for high quality indexable inserts. The reason for this is obvious: It combines maximum protection with practical design and easy handling.

The InsertBox HighS is available in seven different sizes and six different layouts. It not only protects and secures your products perfectly, it is also easy to open and close and can be easily stacked for shipping and storage. Optional foam inserts are also available to maximise protection.

The InsertBox HighS is just one of the items in rose plastics's range of packaging for indexable inserts. To see the full range, visit the website: **www.rose-plastic.co.uk**

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

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Measuring surface roughness on turned parts

Traditionally, cylinder bores surfaces in cars were like the Himalayas with lots of peaks and troughs. When piston rings went up and down, this would slice the tops of these off so manufacturers made the bores tight to pre-empt this. Consequently, in the past motorists need to "run-in" their engine limiting its speed for the first thousand miles or so. While the automotive world has moved on, this is an early example of how manufacturers recognised the value of surface characteristics. Here Mike John, technical director at The Sempre Group explains the importance of surface roughness and how to get the most out of this data.

Surface roughness often dictates how one part interacts with another. For example, if a shaft is rotating inside a bearing, a rough surface is undesirable because it causes excess friction. Meanwhile, a smooth and round surface ensures optimal performance by minimising resistance. If turned parts have the wrong surface characterisations, they could wear out, get bigger, smaller or rattle around.

In the automotive sector, surface texture is vital for anything that rotates in an engine. For example, camshafts will sit on a white metal bearing, a smooth object with a coating and oil will produce a frictionless surface. However, if the surface roughness is poor this will cause metal-to-metal contact. Consequently, the part will wear quicker and irregularities in smoothness can produce nucleation sites where breaks and corrosion occur.

Measurement in action

On the shop floor, most engineers and manufacturers use Roughness average (Ra) to measure change in process and understand micro- and macro-level geometric irregularities. The Ra will tell them if their tools are wearing out and producing different surface characteristics over time. Armed with this information, they can decide whether to make a tool change to remain within spec.

Ra won't give the full picture, just an average. It assigns a value to the deviation away from a median height, say on an engine's crankshaft, but says nothing about the direction of surface performance. Knowing what parameters will provide the required functionality of the surface is the first step. For instance, manufacturers can use plateau honing to create a metallurgically stable microstructure on the wall of a cylinder bore. Then, they can characterise the peaks and troughs as a number using skewness (RSK) and determine whether this is positive or negative. Automotive manufacturers will often use three or four characteristics, including Rz and Response Surface Methodology (RSM).

There are two methods of finish measurement: skidded and skidless. Skidded stylus systems are ideal for simple measurement of high-frequency surface roughness, while skidless technologies are better for low-frequencies ripples, waviness and surface profiles. For example, the Jenoptik Waveline W5 features a skid situated by a stylus. The skid drags along the surface to remove the need for a straightness reference, removing added costs. The system can measure up to 28 parameters and includes a changeable probe and guide system for adaptability.

Data collection

Most engineering drawings specify the required dimensions and

surface texture of turned parts. Following measurement, manufacturers can compare their system's output against the initial spec to determine compliance. Despite its importance, most manufacturers don't tend to gather their surface roughness data or store it effectively. It's often treated as a tick-box exercise and, providing it's within spec, many don't give it a second look.

However, automated solutions can help manufacturers gather surface roughness data and export it easily. For example, using High QA Inspection Manager, they can scan entire drawings, or multiple pages, in one click and automatically extract surface roughness data. The process is fully automated, enabling total traceability.

The automotive industry has come a long way from tight cylinder bores, but surface roughness is still as important as it ever was. Knowing how to measure surface characteristics accurately and then capture this data is vital for ensuring part efficiency and functionality.

To find out more about Jenoptik optical shaft measurement systems, visit the Sempre website.

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Hexagon cuts costs of wheelset inspection and brings predictive maintenance to the rail industry

With the latest product CALIPRI X, together with CALIPRI Predictor, Hexagon has introduced a ground-breaking automated and permanently installed solution for precise train wheel profile measurement and predictive maintenance

Hexagon's Manufacturing Intelligence division has announced the launch of CALIPRI X, a fully automated on-track wheelset measurement system that delivers significant productivity gains and operational cost savings to the rail sector. Combined with the analytical capabilities of the cloud storage and analysis tool CALIPRI Predictor, CALIPRI X allows rail operators to safely run their trains with longer, more predictable maintenance intervals, less downtime and reduced lifecycle costs.

Safety is paramount in rail. Regular wheelset measurements must be made to meet stringent safety requirements and ensure safe operation and passenger comfort. However, measurement of wheels and wheelsets is still typically performed manually, which is labour intensive, time-consuming and costly. CALIPRI X removes this need for manual measurement by effortlessly delivering precise results in seconds from an automated permanently installed optical scanning system designed for 24/7 operation.

"We've really pushed back the boundaries with this integrated solution," says Peter Lehofer, CALIPRI product manager at Hexagon. "It's a genuine market first that meets rail industry needs for fully automated wheelset measurement without the sacrifices of precision and reproducibility that are commonly seen in products available today. The combination of highly accurate and reliable data, ease of use and the analytics provided by CALIPRI Predictor will save our customers a lot of money and bring peace of mind as they maintain their rolling stock over its lifecycle."

With CALIPRI X, the measurement process couldn't be simpler: a train drives slowly over a sensor unit where laser and camera modules automatically measure and record the profile of the wheels. The system measures all wheelset parameters according to the European standard EN 15313 including wheel profile, diameter, back-to-back distance, equivalent conicity, camber and wheel toe.

The most important parameters and variables are known in seconds and out-of-tolerance areas immediately identified. Combined with CALIPRI Predictor, measurements are automatically and instantly stored in the cloud and wear evolution is evaluated to enable planned downtime based on the as-is and forecasted condition of wheels. Unplanned downtime caused by wheel condition is eliminated.

The system is the latest development from NEXTSENSE, part of Hexagon's Manufacturing Intelligence division. CALIPRI X builds upon Hexagon's proven CALIPRI non-contact optical laser measurement technology. CALIPRI handheld devices are well-known and recognised across the rail industry for providing quick, exact and reliable wheel profile measurement with unmatched repeatability.

CALIPRI X is easily installed on existing tracks and is designed for 24/7 all-season operation. A rugged sensor unit with no moving parts ensures the system withstands the harsh railroad environment and requires minimal maintenance. Temperature compensation allows operation in any weather to ensure reliable results year-round. For the best productivity, the system is designed for installation on tracks where trains frequently run: in front of depots, workshops, washing facilities, or in sidings. This allows frequent measurements to be made without extra effort or costs. With no start-up delay, it is always ready to go.

Making more measurements means more data on wheel wear is available for analysis, allowing CALIPRI Predictor to accurately forecast wear levels. Rail operators can plan their maintenance based on the wheelsets' actual condition, allowing trains and entire fleets to be operated with longer, more precise maintenance intervals and less downtime, resulting in significant operational cost savings. CALIPRI Predictor ensures full traceability of measurement results and allows secure access to data and analytics for fleet technicians, workshop owners, maintenance workers and other company personnel in the workshop or office, or even on the road.

CALIPRI X and CALIPRI Predictor are available for immediate order by visiting the web product section or by contacting your local Hexagon representative for more information.

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Scanning with ease

The capabilities of a 3D scanner are endless. With a variety of modern equipment available, no project is too big or too small. Some users may find it difficult to always keep an eye on the laptop screen whilst scanning or may find themselves in a scenario where it isn't possible to have the laptop within line of sight of the scanner.

A very simple workaround is available with the help of some simple equipment and an active internet connection. All you need is a remote desktop app, such as TeamViewer and a universal phone holder with an adhesive mount. Simply stick the mount to the scanner, mount the phone to the scanner and connect to your laptop via TeamViewer. You now have a mirror image of your laptop screen on your phone and can control the scanning software remotely.

This trick is useful for scanning tasks that involve a lot of stop/starting of scanning. It's also perfect for situations where your scanning object is fixed in place and you must work around it. Once scanning is complete, simply switch back to the laptop for comfortable post-processing.

It is as simple as that, a complete, interactive, adaptable and wireless display that allows you to scan with ease for less than £30.

Manchester Metrology Ltd is a pioneer and innovator of metrology, offering specialist contract measurement services using the latest metrology technology and equipment. An ethos of dedication to continued investment in both equipment and its team has allowed the company to build a strong reputation, working with a number of industry leaders in the automotive and aerospace sectors.

Offering a portfolio of support services across the UK and worldwide, its attention to detail and helpful attitude towards customers are among the many positive attributes which distinguish the company as a benchmark metrology company.

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Coordinating quality with Mitutoyo

Founded in 1992, Rotherham-based Magtec is the UK's largest supplier of electric drive systems and specialist hybrid solutions. The privately-owned business' innovative technologies include motors, gearboxes, generators, power controllers, battery systems and condition monitoring systems. Magtec designs, develops, manufactures and installs electric drive systems and components across a wide range of transport types. Vehicles currently using the company's advanced systems include heavy goods, buses, off-road multi-wheeled and tracked defence vehicles and bespoke specialist vehicles.

To enable the business to significantly scale up its production volumes and to meet ever rising domestic and international demand for its technologies, Magtec recently moved into a new 64,706 sq ft site located at Templeborough, near Rotherham. The impressive facility will allow the company to consolidate its processes and cover the full design, manufacture and integration of its world-leading drive systems. The recent move saw Magtec's employee count rise from 125 to 155 people and the business continues to recruit across all engineering and operational disciplines.

Magtec's electric vehicle technology enjoys an excellent reputation for its reliability. To ensure the continuation of its premium quality standards, the business administers a rigorous, company-wide quality control regime and makes use of a range of advanced inspection aids. The latest addition to Magtec's collection of high-tech measuring equipment is an advanced Mitutoyo CRYSTA-Apex S Coordinate Measuring Machine (CMM).

Tom Dalgliesh, head of quality at Magtec says: "In addition to having an outstanding reputation for the efficiency of the advanced technologies that we provide we also enjoy an excellent reputation for the premium quality of our products. As well as our production personnel performing regular in-process checks, our quality staff carry-out thorough final inspection routines before our products and systems are dispatched.

"When the need arose for a high-precision CNC CMM, in addition to considering the potential machine's precision standards, mindful of our rapidly increasing production volumes, we also considered factors such as speed and ease-of-use. As it satisfied all of our accuracy and efficiency requirements and as we were aware of the excellent reputation of Mitutoyo CMMs, we chose a Mitutoyo CRYSTA-Apex S CMM with an XYZ measuring capacity of 900 x 1,000 x 600 mm.

"Now installed in our temperature-controlled inspection department, the CRYSTA-Apex S is delivering the high-levels of precision that we need. Also, because of its impressive speed of operation and fast acceleration, not only is our new Mitutoyo CMM able to keep-pace with our current output levels, it will also be able to cope with the massive rises in production and the increased amount of inspection work that we anticipate.

"Having written a large number of part programs, we are now able to load single large components or large batches of smaller parts onto the Mitutoyo CMM's bed, recall the relevant programs and start rapid, automated CNC inspection routines. It helps our inspection efficiencies that, when the unmanned inspection of multiple parts is taking place, our operators' time is released for other quality control tasks.

"At the end of each measuring routine, when appropriate, we are able to use the Statistical Process Control (SPC) data generated by the CMM to provide valuable feed-back that enables the fine-tune of our production and assembly functions. In addition, all of our inspection results are archived."

Mitutoyo CMMs are available across a wide range of size and accuracy classes and are able to cover practically all precision 3D measuring applications. In addition, Mitutoyo UK provides first-class levels of CMM training and service support.

To enable users' inspection operations to keep-pace with today's fast-paced production speeds, Mitutoyo's feature rich, yet easy to use CMM analysis and reporting software ensures that all measurement

results are quickly interpreted. Also, if required, comprehensive inspection reports can be automatically generated.

The Mitutoyo CRYSTA-Apex S model, as purchased by Magtec, is an advance CNC CMM that meets global standards. In addition to boasting an impressive accuracy specification, CRYSTA-Apex S Series CMMs deliver impressive levels of inspection efficiency. For example, the high-performance machines deliver a maximum drive speed of 693 mm/s, 27.2"/s and a maximum acceleration of 2,309 mm/s^2, 7.57"/s^2.

To ensure excellent levels of rigidity, a range of advanced, robust structures are employed in CRYSTA-Apex S Series CMMs. The CMMs' Y-axis guide rails are integrated into one side of the machine's granite surface plate, ensuring minimum deterioration and prolonged accuracy levels. Also, air bearings are located on the underside, front and upper surfaces of the CMMs' X-axis slider units. This arrangement minimises vibration, even during high-speed, high-acceleration movement and ensures stable linear motion.

CRYSTA-Apex S CMMs are equipped with an advanced temperature compensation

system that guarantees the accuracy of measurement results under temperature conditions of 60.8 to 78.8 °F, 16 to 26 °C. In addition to providing high-precision results in a temperature controlled quality department, thanks to the CMMs' temperature compensation system CRYSTA-Apex S models are also able to deliver first-class levels of precision on the shop-floor.

CRYSTA-Apex S CMMs use Mitutoyo's renowned MCOSMOS modular software. The easy to use, highly-efficient software allows users to quickly organise, execute, calculate and report all findings. MCOSMOS boasts multiple useful features. If required, the software enables measurement programs to be organised on networks while results can be archived in a range of formats including PDF, XLS and HTML. Commands and instructions can be added to guide operators through their inspection routines and inspection reports that meet individual customers' needs can be created. Other useful MCOSMOS elements include a comprehensive Statistical Process Control (SPC) package.

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Renishaw keeps calibration simply accurate with the launch of ACS-1

Spindle probes for CNC machine tools can be highly repeatable, but their performance relies on accurate calibration. Renishaw has developed a simple solution to overcome the challenges associated with the manual probe calibration process while consistently achieving high levels of repeatability. Accurate calibration ensures the probe's performance is repeatable within the machine tool environment.

Today, many users perform the probe calibration process manually, which can cause variability even among skilled operators. Inaccurate probe calibration can affect all subsequent measurements; ACS-1 addresses this via a lockable mechanism that removes the need to use precision gauge blocks or slip gauges.

Introducing the ACS-1 process

ACS-1 is mounted on the machine tool table or chuck using its magnetic base. A test bar, or a tool of known length, establishes an accurate datum surface by pushing the plunger down to the desired position, the plunger is locked in place. The probe's overall length can be accurately calibrated, using the calibration disk, the top surface of the lockable plunger. The probe's stylus ball diameter calibration takes place on the Datum sphere, which can be mounted in two different positions on ACS-1 according to the CNC machine configuration.

The advantages of ACS-1

The Datum sphere can be mounted on one of two faces, both at a 45-degree angle. The mounting options allow ACS-1 to be the ideal probe calibration device for various CNC machine tool configurations. This includes vertical mills, lathes, turn-mills and 5-axis machines as the magnetic base allows the artefact to be mounted vertically or horizontally.

The ACS-1 can determine the probe's overall length and stylus ball diameter within minutes and does not require batteries. Richard Cox, design group applications manager for Renishaw's machine tool products division, says: "ACS-1 is highly accurate. It reduces manual operation, therefore reducing human error and ensuring quick, accurate measurements. It also sits alongside our fully automated solution, AutoClock, offered by our associate company, MSP."

Renishaw has engineered a cost-effective solution for simple, accurate probe calibration. ACS-1 is now available to order worldwide. For further information on ACS-1, visit **www.renishaw.com/acs**

Linex Manufacturing overcome inspection challenges

A move to Renishaw's Equator™ 300 automated gauging system gave Linex Manufacturing all the inspection speed and accuracy it needed. However, on a project implemented before the larger Equator 500 was available, bolt holes on the extremities of a workpiece lay just outside the gauge's working envelope. When standard styli and stylus extensions could not reach, an additively manufactured custom stylus provided the answer.

Linex Manufacturing is a division of Linamar Corporation, a leading automotive parts manufacturer, which uses multiple Equator flexible gauges at many global production plants. At its base in Ontario, Canada, Linex produces a range of precision-machined automotive components.

Its core business lies in the production of automatic transmission components used in medium- and heavy-duty commercial vehicles. Its customers are global transmission manufacturers, and production volumes are high. Linex first purchased two Equator 300 gauging systems in 2015. When a major new product launch required continuous 5-day working with three rotating 8-hour shifts, it decided to buy four more Equator 300 gauges in 2017 to keep pace with the elevated production levels.

Capable of component scanning speeds in excess of 200 mm/s and maintaining high accuracy over the temperature range of 5 °C to 50 °C, the Equator 300 provided Linex Manufacturing with a versatile diametric inspection volume of 300 mm to a height of 150 mm, capable of supporting workpiece weights up to 25 kg.

The Equator gauges were tasked with performing high duty-cycle in-process inspection of a wide range of production processes and customer-critical part features. The gauges also helped free up the availability of Linex's quality laboratory Coordinate Measurement Machines (CMMs).

Since this project, Linex became the first company in Canada to operate Renishaw's Equator 500, an automated gauging system with an even bigger working envelope, inspecting automotive workpieces up to four times heavier.

Introducing the Equator gauging systems to Linex' shop floor had a significant positive impact on productivity while increasing production capability and inspection process throughput.

Narcis Georgescu, senior quality supervisor at Linex Manufacturing, explained one unexpected challenge: "For one component in particular, a front support assembly, we needed to closely inspect a series of 11 mm bolt holes required for mating to another component. Precision was paramount and they had to be inspected thoroughly. The challenge we faced was that these bolt holes lay just outside of the Equator 300 working envelope.

"Initially, to overcome this challenge, a unique L-shaped tool

configuration was produced with multiple components that could help extend this volume and provide us with the inspection access we needed. While it seemed to worked well, over time, it was causing an unexpected measurement uncertainty."

Thorough metrological testing of the Equator system carried out with Renishaw engineers verified the repeatability of the gauge itself. It confirmed the need for a robust stylus construction for specifically inspecting the bolt holes. Determining that a probing setup using multiple components did not provide the necessary rigidity, Renishaw proposed the development of a custom stylus using metal Additive Manufacturing (AM), also known as metal 3D printing.

Conceived digitally in 3D CAD software and printed at Renishaw's Solutions Centre in Ontario, Canada, an elegant Z-shaped stylus was produced as a single-piece monolithic construction with internal latticework to reduce its weight and avoid the risk of false triggers.

The stylus was rapidly printed with a high-strength titanium alloy powder on a Renishaw RenAM 500Q metal additive manufacturing system using a process known as metal powder bed fusion, or laser melting.

By avoiding traditional manufacturing techniques, such as casting, forging and machining, Renishaw provided a complex, single-piece stylus solution to Linex quickly.

The introduction of the custom-designed, additively manufactured stylus brought Linex the accuracy and repeatability it needed to inspect component bolt holes outside the Equator 300 gauge's working envelope.

A few years on and the original AM stylus is still running without any degradation in its performance. Linex purchased a second AM stylus in the exact same design and the company is now operating six Equator 300 gauges and one larger Equator 500 gauge.

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Inspection accuracy and efficient data transfer with the new Bowers DigiMic

Bowers Group's newly launched DigiMic digital micrometer has already impressed within the engineering sector, with Berkshire-based Hewland Engineering Ltd. reporting improved efficiency within its quality and inspection processes.

Hewland's history walks proudly alongside the heritage of motorsport, manufacturing bespoke and OEM gearboxes for racing applications, internal combustion and EV sectors in performance vehicles and in the marine and aviation sectors. Its dedicated Advanced Engineering and Design Group is tasked with ensuring that all technical considerations are to the highest standard, therefore it is essential that projects are completed with precision accuracy.

Adrian Jarych, QHSE engineer at Hewland, says: "As a quality engineer and inspector I find the DigiMic really useful for everyday component inspection work. It's easy to turn on, easy to calibrate and it's ready to use. The thimble is smooth and the

accuracy is great. The parts we produce are used in the manufacturing of motorsport and automotive transmissions and gearboxes where precision is key. I feel confident of the accuracy and know I'm getting trustworthy readings from the DigiMic."

Used by Hewland Engineering to measure diameters and widths of metal components, such as layshafts, pinion shafts, gears, hubs, clutch shafts, drive shafts and many other gearbox components, the DigiMic has already proven its reliability with pinpoint accuracy.

The DigiMic boasts an impressive accuracy of 2 µm max permissible error and 2 µm max error range. Ergonomically designed to fit comfortably in the hand, the device is an exceptionally robust micrometer perfect for shop floor use. Manufactured with an IP67 protection rating, the extra-large digital display makes reading data straightforward with the user having an immediate visual confirmation of measurement in hand.

Feedback from Hewland Engineering has indicated that the DigiMic has helped achieve an accurate thickness of gears and bearing journal diameters within its .010 mm tolerance. It offers them an easy-to-use device with a large, clear digital screen, with the weight of the micrometer providing a substantial, high-quality feel.

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Cimatron releases Version 16

Process optimisation, usability and new technology allows toolmakers to deliver higher quality tools faster, easier and more efficiently

Cimatron, a leading CADCAM software supplier for the mould & die industry, has announced the release of its mould & die focused product Cimatron V16. After an intensive period of industrial beta testing, Cimatron V16 is now available for general distribution.

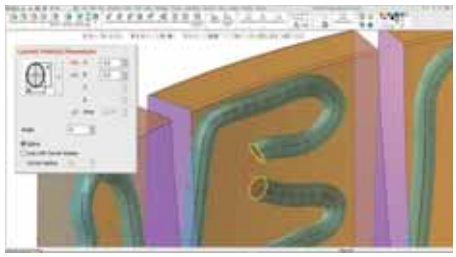
Version 16 is a substantial release introducing many new features in all areas of the product, including a clean new UI and increased automation for faster mould design, electrode creation and NC programming. In addition, the continued emphasis on solutions for toolmakers includes powerful functionality for die addendum surfaces, mesh manipulation and drafting detailing.

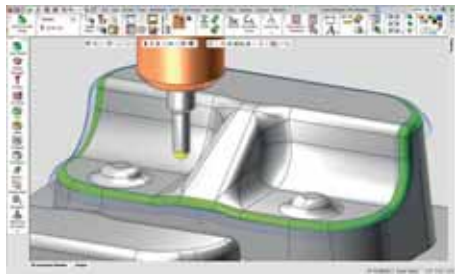
Significant CAD enhancements include the ability to create structural ribs from either a 2D or 3D contour, with draft angle and flat or rounded tops. Working with mesh models has also been improved with new capabilities for closing open areas, curvature mapping and the option to define local mesh areas where it is possible to set finer mesh tolerances to describe more intricate model details.

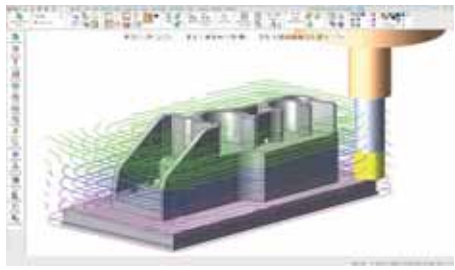
User efficiency continues to be a focus with the process workflow having been improved in several areas including batch printing with support for shaded views, dynamic triad dragging, expanded BOM support for assembly structures and extended preferences control with the ability to search and reset.

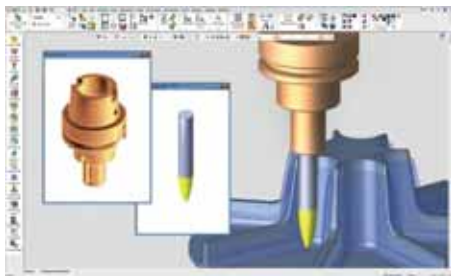
For mould makers, several new mould layout types are now available including smart mirror and array with the setup wizard controlling the parameters for layout sub-type, rotations and cavity distances. In addition, a new feature for automated ejector locking has been added that detects which ejectors need to be locked and the type of lock required to prevent their rotation in the ejector plate and then modifies the head to create the appropriate pocket in the ejector plate.

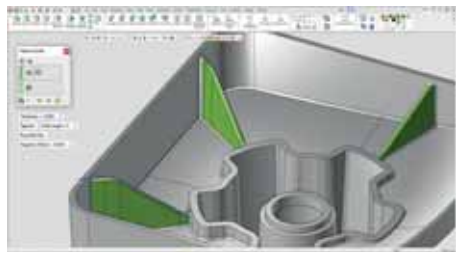
Surface extension capabilities have been enhanced for both mould and die makers with a new tangent skin extension function which provides the ability to automatically extend surface edges to aid the construction of core and cavity parting faces. The die

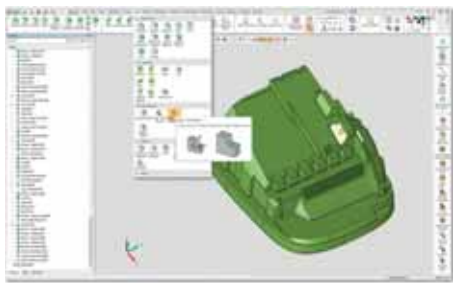


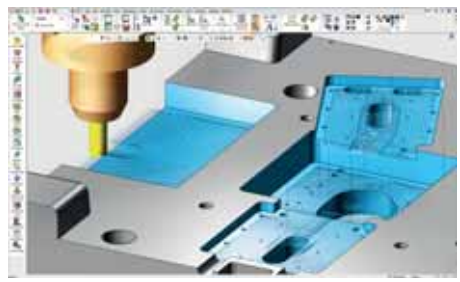


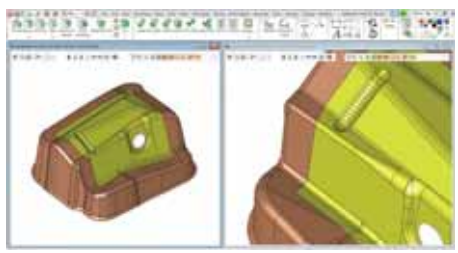












design extend faces has also been improved to better manage internal corner conditions that would create overlapping face extensions. In this scenario, it is now possible to replace the affected area with a smooth continuous patch surface.

Conformal cooling can benefit all types of moulded parts and Cimatron 16 now offers more automated methods for superior cooling path generation. Also, a new virtual volume function lets the user limit a cooling circuit to a portion of the shape volume and avoid sections that do not require a cooling channel. Further enhancements include a new optimised curvature function that highlights areas where a cooling channel cannot be created, such as a curve radius smaller than the channel diameter, providing the user with point-and-click controls to correct the channel path.

Electrode design is a critical part of the mould production process and Cimatron 16

brings a number of major developments. These include the ability to apply surface-based templates for multi-lump electrodes, EDM setup enhancements for material support with connected manufacturing attributes and support for System 3R holders. For the production process, machining electrodes is easier to control as users can now specify the electrode burning stage from rough through to polishing directly within the NC-Setup. All relevant machining parameters will be applied automatically according to the EDM setup with a new mechanism to automatically create the NC files.

Cimatron 16 represents another release with major CAM developments to support NC automation. 3-axis rough and volume pocketing now supports the automatic selection of multiple cutters of different lengths for the optimum cutting sequence by splitting the toolpath into multiple operations based on cutting length. This efficiency feature for rough parallel, rough spiral and volume pocket results in better tool selection, reduced tool vibration, extended tool life and faster cutting speeds.

VoluMillTM pocketing can now be applied to multiple open and closed pockets of differing heights and depths as a one-step routine and single NC operation. Other 2.5-axis operations include a new capability in the slotting procedure that uses pre-drilled holes for safe material entry and to speed up machining with optimum toolpath movement at each level. Further efficiency gains can be achieved with multi-axis drilling routines that consider the real stock model instead of the geometry bounding box. This creates a starting point closer to the stock for a safer, faster machining cycle.

For 3-axis machining, the geodesic morph and geodesic 3D-step procedures which generate constant surface stepover toolpath for high quality surface finishing are now available for all NC users.

5-axis deburring has been extended to support extra cutter types including end mill, sphere mill, lollipop mill, taper mill and chamfer mill. Importantly, the new multiple cuts feature enables the user to create more than one cut along a sharp edge to generate a chamfer or fillet shape either by constant width or by constant depth for a chamfer or by constant width or constant radius for a fillet.

Other CAM developments include automatic arc for lead-in/lead-out, additional surface path options for milling, better handling of undercuts for 5-axis roughing and the ability to import cutters and holders directly from external data formats such as STEP, IGES and STL, as well as Cimatron solid files (ELT). The system automatically identifies the shapes and creates their respective representation in the tooling database table. In addition, the ability to copy and paste geometric data between procedures allows users to efficiently input data between machining procedures, or to multiple procedures, for easy and error-free programming.

Discussing the new release, Antonio Parisse, Cimatron VP says: "We are delighted to launch Cimatron V16 and feel there is a good mix of process optimisation, usability and new technology that will benefit users in all areas of the product and allow toolmakers to deliver higher quality tools faster, easier and more efficiently."

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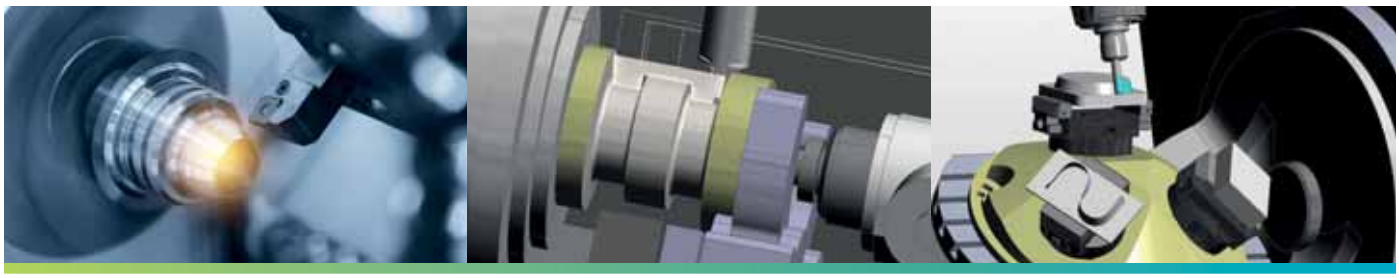

Smarter software for smarter machining

VERICUT Version 9.3
CGTech has announced the latest release of VERICUT, Version 9.3. VERICUT is a leader in machine simulation, verification and optimisation for all types of CNC machining, additive and hybrid manufacturing processes. The software operates independently, but also integrates with all leading CAM systems.

VERICUT 9.3 focuses on creating "smarter," more efficient manufacturing processes with features that bring in data around the machine, the tools and the stock to improve simulation and the overall manufacturing workflow. Improvements have been made to strengthen VERICUT's core, including improved collision checking, increasing the limit on axes per subsystem and cutting tool data in the tool performance. Hundreds of customer-driven changes and improvements have also been addressed in this latest release.

"VERICUT 9.3 provides smarter data for smarter manufacturing, giving our customers a 'cutting edge,'" says Gavin Powell, managing director of CGTech. "With enriched machining metrics, force feedrate and tool deflection optimisation, this latest VERICUT release creates the most highly optimised, yet safe to run NC programs for any CNC machine."

VERICUT's integrated optimisation module, VERICUT Force, has also received additional features and enhancements in 9.3. Alongside improvements to core features and functionality, deflection calculations have changed to account for the entire rotating tool assembly, where previous versions only accounted for solid round tools with holders. This change in deflection along with cutting tool data and information about stock material, improves part surface finish, ensures the part meets the appropriate dimensions and extends cutter life.

"We've seen up to 40 percent more tool life and 30-40 percent savings in machining cycle time when using VERICUT Force," says Jason Mills, engineering manager at Advanced Manufacturing, Ltd. (AML). "The module is invaluable for our production work as it provides us with a competitive edge. It's quite easy to understand. We simply pick the material from the database and input the cutter geometry, which we get from the tooling manufacturer. Force then does its calculations in the background."

VERICUT 9.3 highlights
Build, manage and reuse assemblies
Use VERICUT's Assembly Manager to create and manage portions of your NC machines such as rotary table configurations, angle heads for machining, robot end effectors, or various workholding setups with fixtures and workpieces to be machined. The library of assemblies saves programmer time since they are easily accessed by others and for repeated use in new VERICUT projects.

Status and HUD Improvements
Streamline machining and information seen in the Status Window and Head Up Display (HUD). The HUD can automatically update to match visible Status information, or use "Field Visibility Edit Mode" to concurrently edit Status and HUD configurations. Users can lock and unlock the visibility of status groups to retain the same layout for every VERICUT project they open moving forward.

Force optimisation improvements
Achieve better machined part quality and longer tool and spindle bearing life with improvements made to Force. Deflection calculations have been updated to account for the entire rotating tool assembly, including indexable insert mills and model file cutters. Users can also add Volume Removal Rate (VRR) limits to all cutters. Analysis and optimisation for solid round tools and complex cutters has also been added.

Tool Performance Database (TPD) and Machine Optimisation Data (MOD)
VERICUT's Tool Manager now includes a Tool Performance Database (TPD) that suggests starting spindle speed and feed rates values to use with cutters in a wide range of stock materials. This data works with Machining Optimisation Data (MOD) in VERICUT's Tool Manager. MOD displays a table of spindle speeds and feed rates that helps programmers choose appropriate cutting speeds and chip thickness values based on the cutting tool used, and stock material being machined.

CGTech's VERICUT® software is the standard for CNC simulation, verification, optimisation, analysis and additive manufacturing. CGTech also offers programming and simulation software for composites automated fibre-placement, tape-laying, and drilling/fastening CNC machines. VERICUT software is used by companies of different sizes in all industries.

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Metamation celebrates ten years in the UK

Metamation is celebrating the 10th anniversary of its UK branch this year. It was originally created in 2012 where it already had an established customer, partner, reseller and OEM base. It has continually grown its support team to help deliver top level support for its comprehensive and leading sheet metal, CADCAM software. Since the UK office was established in Redditch, West Midlands, the company has shown good levels of growth and most importantly good customer feedback through the deliverance of product and support it offers. It has also continued to invest in employee development and apprenticeship schemes.

Metamation's core is designing, developing and delivering cutting edge sheet metal CADCAM software for a large range of machines in yesterday's and today's market place. It has various modules from CAD solutions, offline bending, punching, cutting, nesting and smart front end software solutions that can help drive efficiency and cost savings. This is developed internally and not only gives the users a consistent and logical programming environment, but extremely flexible software as well.

The company invests heavily in development and has also been making 2nd generation software releases where, like most companies, it continues to issue updates year on year. The software's evolution is providing more efficiency without the introduction of more time to achieve better results. An example of this is the upgrade to Flux Bend which is now three to four times more efficient than the 1st generation bending software along with Flux Nest that can save users more material and machine time.

Metamation would like to firstly thank its team members, both local and global, from across all areas of the business for the work they have put in over the years. Having innovative products for the sheet metal manufacturing industry is nothing without a support team to back it up. It is grateful to all its customers, resellers and partners from all the regions that is works with and the company looks forward to keeping businesses updated with the next generation of sheet metal CADCAM software."

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Stächelin is a cut above with two StM waterjet systems

Granit-Marmorwerk Stächelin GmbH has been working with the unique material natural stone for more than 50 years. As an innovative company, it is always on the hunt for new ideas, better solutions and process optimisations in every segment. That is why the German company now places its trust in two waterjet cutting systems from StM.

The natural stone specialist Stächelin is headquartered in Baden-Württemberg in Efringen-Kirchen. The family company, founded in 1964, has focused on processing natural stone for more than half a century. Its services range from bathrooms and kitchen tiles to gardens and exterior installations through to exclusive lobbies and reception areas. "Our goal was and is to find the perfect union between tradition and innovation. That is why, today, we are one of the first places to go in Germany when it comes to exclusive natural stone work," explains Uwe Stächelin, who runs the company with his sister, Yvette Rathberger-Stächelin, as a managing shareholder.

The highest quality and competent advice

Before the production facility was equipped and retrofitted with the first StM waterjet cutting system years ago, Stächelin thoroughly researched the market. One reason it chose the Austrian waterjet cutting specialists was the competent advice. StM waterjet GmbH started as a stonemasonry company and is therefore familiar with the needs of its stone-processing customers. To meet the highest demands, even in production, Stächelin therefore relies on an StM PremiumCut waterjet cutting system with a 68° cutting head.

Avoid downtimes with a second unit

The first StM waterjet cutting system was soon in use at Stächelin for ten hours every day. "Everything runs faster and more precisely and the quality and precision of the mitre cuts are exceptional," Uwe Stächelin says. The high cut quality was equally as crucial as the high capacity with respect to the decision to get a second PremiumCut unit from StM as Uwe Stächelin continues: "Now both waterjet cutting systems run 10 hours every day and we have a back-up that ensures there won't be a complete production shutdown and failure."

Score with state-of-the-art technology

Cutting natural stone and ceramics is a special leading discipline of waterjet cutting systems because it requires almost no post-processing. There is no risk of discolouration or deformation because the jet does not leave behind any rough edges and only leaves a small amount of waste. The technology scores due to its high linear precision along the entire cutting length. Even mitre cuts longer then 3 m can be cut.

StM waterjet cutting systems are easy to operate, despite complex options. They are highly available due to the standardised modules and service. Your connectivity allows for remote maintenance and expansions via updates. And, according to Uwe Stächelin, the systems are: "The gentlest way to cut natural stone, ceramics, quartz, composites and more. Especially with large, decorative washbasins, we see the significant benefit, we can cut on a mitre, glue and it looks like a beautiful, large hole," he explains. This mitre cut is so essential nowadays, waterjet cutters have become indispensable.

New options and a new range of products and services

Since it is now possible to offer services that couldn't be offered in the past, the waterjet cutting systems have also expanded the company's range of products and services. Many things have become more demanding and this stimulates business enormously. Waterjet cutting is excellent for inlays, lettering, company logos or flooring and wall coverings and opens endless opportunities for creative design. One benefit is that the minimum cutting kerf width of the waterjet harmonises perfectly with hard and brittle materials, so the edges can't break out.

Can't is a thing of the past

Uwe Stächelin mentions one very important thing, last but not least: "There are natural stones that you can't saw. With quartzes and crystalline stones, you just can't get a clean, smooth cut. Back then, it was very complicated, every time, to find suitable solutions. With the waterjet cutting systems, these problems are a thing of the past, thank God," says Uwe Stächelin with a smile.
For even more satisfaction, StM supports its customers from technical advice, business planning and sample calculation through to

the planning of complete systems, test methods, shipping and sales training to the procurement of subcontract orders. Water and abrasive recycling systems are also available as additional components. StM waterjet cutting systems are also 98 percent recyclable.

Stächelin specialises in high-end, interior and exterior, natural stone solutions. Located in Efringen-Kirchen in the District of Lörrach, near the German-Swiss-French border, the 100 percent family-owned company manufactures exclusive solutions for many customers in Germany, Switzerland and France. The company provides all services, planning, processing and assembly, required to perfectly implement a defined concept. Stächelin is one of the best addresses in Germany when it comes to outstanding natural stone processing.

Passion, know-how and an insatiable appetite for innovation have made StM a leading international supplier of waterjet cutting systems. With great enthusiasm, it has been developing future-oriented solutions for production in particular for the steel, aluminium, metal, plastics, composite materials, stone and glass industries for more than 25 years at its company locations at Eben in the district of Pongau in Austria and Schweinfurt in Germany. The StM name stands for high-end equipment which has been developed as modular systems for highly efficient individual solutions; for an unusually high customer focus and for its passion for the continual improvement of waterjet cutting technology. Its innovations turn the concept of cutting using the force of the waterjet into a unique and reliable precision technology.

All components meet the highest demands with respect to quality and cost-effectiveness. The StM customer always acquires cutting edge technology because collaboration on research, for example with the Fraunhofer Institut and universities, together with continuous improvement of products are extremely important to the company.

Without exception, it utilises commercially available branded components which guarantees both short lead times and minimum maintenance expenditure. Nevertheless, should a minor fault still occur then its professional and personalised customer service can help to solve the problem in the shortest possible time. Not only does StM want to generate customers, but also to gain long-term partners who it supports with help and advice way beyond the sale itself.

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The origins of waterjet

Most origin stories seem to be either extremely far-fetched or particularly ordinary. Waterjet's genesis falls somewhere in the middle. The technology we know today, used for numerous applications, including cutting stone, steel, and glass, has evolved significantly since it was developed in the 1950s, initially used to cut lumber from trees.

Within the last couple of decades, automation has created additional efficiencies for machine operators and the ability to produce more precise cuts. While the waterjet industry doesn't include an Archimedes "eureka" moment or a Steve Jobs-esque garage-based origin story, its history does offer its own interesting set of twists and turns.

Here's how waterjet got its start and became one of the most effective tools in the fabrication industry.

Coming out of the woods - waterjet got its start cutting trees

Dr Norman Franz was a forestry engineer who wanted to find a more efficient way to produce lumber. In the 1950s, he did just that by discovering that pressurised water could create a supersonic stream capable of cutting through trees. He used a polymer injection pump, created by McCartney, to create a continuous stream.

The early models of waterjets largely dealt with materials like cardboard, paper, fibreglass home insulation, disposable diapers and other softer substances. The novel cutting machine was no doubt an impressive invention but it had not yet reached its full potential.

A new world of possibilities - an ashtray changed the course of waterjet history

Dr Mohamed Hashish was a PhD student interested in waterjet technology. In particular, he wanted to increase waterjet's power. In the 1970s he was working on his doctorate and the technology was still only able to cut soft materials. One night, while leaving work, he developed an idea that involved his coffee cup and an ashtray. Here's how he describes it:

"My first try making an abrasive waterjet was while I was writing my thesis on the theory of waterjet cutting. I was going home around 8:30 pm and somehow I noticed the shiny material in the ashtray next to the elevator. My Styrofoam coffee cup was almost empty. I quickly finished the rest of the coffee and scooped some of this shiny material into the cup. Instead of going down to the lobby, I went to the basement where the waterjet machine was. I fired it up and put a piece of wood under the jet to pierce it and repeated the same test with the grit-filled Styrofoam cup in between the nozzle and the wood. It went faster through the wood but made some mess. I knew then what I wanted to do after I finished my degree. I made a list to Flow Research about many projects that I would like to do if I joined them. On the top of the list was adding abrasives to the jet. There were many other ridiculous ideas that I do not want to ever mention.

"I approached the Late Dr Mike Pao, then the CEO of Flow Industries, about the need to cut steel, concrete and hard materials by adding abrasives to the waterjet. He was skeptical, but I made a bet with him. I asked for a 3-month period to try to make a working abrasive laden waterjet. We won the bet: a dinner for me and my wife. At that dinner, I gave him a piece of steel with his name crudely cut in Chinese."

His idea to add garnet to waterjet's stream changed the technology completely. Now, armed with abrasive, waterjet machines can cut through materials that were unthinkable applications during waterjet's infancy: steel, stone and composite for example.

Moving forward

Waterjet has come a long way since Dr Norman Franz's first applications in the 1950s. Yet, at its core, the idea behind the technology remains the same: to effectively cut materials without the need for any secondary finish.

Today, waterjet is a favourite cutting tool among fabricators looking for an efficient process and precise results. In addition, digital tools have made the process even stronger. Stream lag and taper are no longer issues waterjet machines face.

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Multi-head cutting solution for client

WJS UK recently secured a UK order for its Water Jet Sweden model NCH30. The customer needed to produce slots in 75 mm thick high tensile steel bars, with volumes at several hundred per month.

Initially, the customer had specified a single head machine based on what most of the market was promoting. However, by carrying out cutting tests, the experts at Water Jet Sweden demonstrated that by using the Superstream cutting heads, they could better utilise the available pump capacity by cutting with two heads, rather than the more traditional single, large nozzle.

This proposed alternative solution from WJS UK enabled throughput to be increased by 70 percent and processing costs to be reduced by 30 percent per piece. Not only that, since Water Jet Sweden machines are readily adaptable and pre-prepared to utilise additional cutting heads and other ancillary tools, there was only a small additional cost increment to achieve these benefits.

With electricity prices soaring and predicted to continue rising through to the end of 2023, the customer opted for the BFT Servotron 45 kW intensifier pump to provide the high-pressure water. The Servotron pump from BFT is certified by TUV as being 24 percent more energy efficient than the traditional AC Motor driven pumps during typical operation.

With no pressure spikes when the cutting head closes, this pump can be operated at full working pressure while reducing failures in the high-pressure components due to fatigue. The higher operating pressure in this case provides 10 percent faster cutting speed, so for every part produced there is a further 10 percent saving in processing costs and 10 percent more availability of the equipment for production.

Water Jet Sweden has consistently transformed groundbreaking research and development technology into a comprehensive product range with over 700 installed water jet machines throughout the world. By using components that have been tested over many years and manufactured using the latest techniques, in high pressure waterjet cutting and drive engineering fields, it offers CNC machines of the highest technical standard

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Inside one of the largest waterjet cutting facilities in Europe

One of the largest waterjet cutting facilities in Europe is located in Darton, South Yorkshire, just off the M1 and is an integral part of the service network of leading material supplier and supply chain solutions provider thyssenkrupp Materials UK. The site has some of the most advanced flat product cutting facilities in the industry, including routing, guillotining and deburring. However, its unrivalled expertise lies with the nine state-of-the-art waterjet cutting machines, which can easily accommodate hard materials of up to 12 metres in length.

thyssenkrupp Materials UK specialises in the supply of high-quality materials such as aluminium, stainless steel, mild steel, titanium, nickel alloys and composites. The company has recently adopted a new strategic path, called "Materials as a Service", as part of its holding company thyssenkrupp Materials Services. This allows manufacturers to focus on their core business and utilise the expertise of thyssenkrupp Materials UK in managing their material supply, delivering added value services in preparation of the finished product and overseeing subcontractors and logistics. All of this is made possible through years of industry experience, a specialist team and the implementation of a range of digital tools.

The facility in Darton lives up to the "Materials as a Service" strategy and offers an all-around service to its customers, with additional capability such as a 5-axis cutting head on the waterjet machines. This provides the ability to precision cut without any change in the material intrinsic properties, due to heat generation, but also cut on angles and corners. The business also has a microjet cutting head for the most intricate of cuts. As waterjet cutting offers a high yield of material through closer nesting of parts, the company offers an optional nesting service to nest multiple shapes together and cut them with multiple heads. The team can track sheet remnants and nest parts onto any odd shapes to help save valuable material and provide waste efficiencies.

This wide range of capabilities and expert engineering service make the company the preferred supplier to the aerospace industry, serving major OEMs, Tier 1 and Tier 2 manufacturers with products for aerostructures and aero engines. The waterjet machines at thyssenkrupp Materials UK in Darton are also used for near net shapes, before CNC machining commercial airframe parts.

During the past couple of years, however, thyssenkrupp Materials UK – Darton has grown its offering to serve additional industries, as part of the strategic merger of the two divisions: thyssenkrupp Materials UK and thyssenkrupp Aerospace UK, which are now, unified under one, more efficient and sustainable business – thyssenkrupp Materials UK. David Ascroft, general manager at thyssenkrupp Materials UK – Darton, explains: "When we combined the two businesses, we observed a great number of opportunities opening up. These included entering new markets with our waterjet cutting offering. We have now completed several architectural projects, where we delivered custom building facades not only in the UK but also exporting to other countries such as the USA." The future looks bright for the business, which is observing growth in other key sectors such as medical, providing products for MRI scanners.

David Ascroft comments: "With manufacturers from all industries struggling to find a reliable material supply and a partner who understands their needs and can deliver the required quality, we believe that our service can support the industry flexibly and sustainably. We are adaptable to the current volatile environment by being part of one of the global materials and processing leaders in thyssenkrupp Materials Services and we are in constant communication with our customers to ensure that we, together, have enough time to react to whatever challenge we are faced with."

thyssenkrupp Materials UK offers a vast range of products and a wealth of experience in sourcing and supplying products such as stainless steel, aluminium and mild steel. The company also provides a range of services, whether it be fully welded and fabricated finished parts or bespoke flat products cut to exact sizes. To help reduce inventory and costs, thyssenkrupp Materials UK specialises in supply chain management and logistics solutions.

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Waterjet technology from Resato

Resato is a Dutch provider of smart, high-pressure solutions with the aim to increase the productivity of its worldwide customers. Its mission is to meet and exceed the expectations of its customers.

With more than 25 years of experience in high pressure technology, the company is equipped with the knowledge to provide reliable and safe solutions. Its product range includes high pressure technology waterjet cutting systems as well as components and systems for testing, injection and controlling that operate up to 14,000 bar. On the road to a greener future, it has further extended its product range with hydrogen refueling stations, boosters and testing systems. You can find Resato products in the oil & gas industry, hose industry, glass industry, mining industry, automotive industry, aerospace industry and many more.

The company strives to improve its customer's business by providing them with high pressure technology, products and systems that meet or exceed their expectations. Its core competence is to create, control, and manipulate high pressure in fluids and gases. It uses this competence to develop products, systems and solutions in various application areas and markets. By pro-actively gathering customer feedback, it seeks to understand the high pressure related problems in the markets it serves.

Resato waterjet technology

Its waterjet brand symbolises the diversity of Resato and consolidates its high-pressure experience and ability to design standard solutions that provide productivity improvements for customers. With the waterjet technology, it delivers cutting solutions that optimise return on investment and improve manufacturing processes in key ares of time, versatility, space, capacity and safety.

Waterjet cutting is one of the most versatile production techniques. With this technology, a wide range of materials can be cut. Waterjet cutting also reduces the finishing of finished products. This versatility and reduction of finishing has led to an increase in popularity in the production environment. High-pressure pumps are needed to ensure consistent and reliable results. Resato is an expert in the field of waterjet cutting systems. Its robust and flexible system solutions enable you to grow your business.

Waterjet cutting machines

Waterjet cutting machines add versatility to your business. Resato systems are designed for abrasive and pure waterjet cutting applications. Different table sizes and cutting heads make it possible to design tailored cutting systems and grow the system in

the future. Linear drives reduce maintenance costs. The high-pressure pump is designed to deliver contant pressure to the system for a reliable cutting quality. Resato experts support customers in finding the right waterjet cutting machine for their company and application.

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Building better fish processing machinery with OMAX

In Hafnarfjordur, Iceland, Curio builds five different machines for fish processing with the help of four OMAX-brand waterjets

Whether filleting, skinning, or heading, each of Curio's machines come in a range of sizes that handle fish up to 18 kg. Curio states that it brings "devotion inherent in handmade machinery parts, technical innovation and Icelandic ingenuity and with this magical mix it assembles potent seafood processing machines with a strong character and a great performance." In addition, the company offers a sharpening machine that hones the circular knives used in the company's other machines. Curio's products are renowned for their reliability as well as their ability to provide better processing yields with accurate cutting.

"The company started in 1994 thanks to the lifelong enthusiasm and interest in fish processing machinery of the founder, Mr. Ellidi Omar Hreinsson," says Steinmar Gunnarsson, production manager for Curio. "In the early years, the intention was only to have three to four people working in the company and the goal was to keep it small but enough to support the owner and employees' families."

Nevertheless, when the demand for Curio's highly efficient machines grew, the company brought on more employees, added locations, and acquired more advanced equipment. Currently, Curio employs more than 40 people in Iceland, Scotland and Norway.

In 2006, Curio purchased its first waterjet, the OMAX 55100 Precision JetMachining Centre. The OMAX 55100 is the industry-standard workhorse for high-speed precision machining.

"Initially, the first waterjet was purchased to produce fish processing machinery on a relatively small scale," explains Steinmar Gunnarsson. "The biggest advantage is the cleanliness of the cutting process. Second is the fact that there are no emissions, air contamination, from the process. All you need is electricity, water, compressed air and abrasives."

The advantages of waterjet cutting over other cutting methods are numerous when it comes to environmental effects for those who work in the vicinity of the waterjets. Compared to other manufacturing tools, waterjets are relatively quiet and usually work at around 75 dB. There are no chemicals, oils, or solvents involved that may contaminate workpieces or injure operators. Cutting underwater allows for cleaner, safer cutting. Furthermore, the OMAX direct-drive pumps don't incorporate a hydraulic system, which allows for easier maintenance and longer mechanical life.

The precision, accuracy and speed of the OMAX waterjet, especially when cutting very thick stainless steel, was a massive benefit for Curio. "It started with the old 55100, the first waterjet in Iceland, but as the production expanded, the need for more waterjets arose," Steinmar Gunnarsson continues. In 2014, Curio added a MAXIEM 1530 to its production floor.

Usually, Curio uses its waterjets to cut stainless steel from sheets, either 1,250 mm x 2,500 mm or 1,500 mm x 3,000 mm. With each sheet, the company produces an array of parts for the processing machines. The cutting time can last as long as 26 hours.

"When cutting thin materials, although lasers are quicker, there is no hardening of the edge during the waterjet process and post-processing edges is quick and easy," explais Steinmar Gunnarsson. Though Curio primarily cuts food-grade stainless steel, it also uses its waterjets to cut aluminum as well as Polyoxymethylene (POM) and Polyethylene High-Density (PEHD) plastics up to 30 mm thick. As Steinmar Gunnarsson states: "Waterjets can cut through any material, metals, plastic, wood, glass. Virtually anything that can be fastened to the cutting table."

The MAXIEM 1530 gave Curio a boost, but the company still needed more. In 2019, it added an additional two OMAX 60120s, both with 100 hp pumps. These robust and reliable systems require little maintenance and are as easy to use as conventional machine tools, particularly with a bridge-style Y-axis for unobstructed material loading.

Steinmar Gunnarsson concludes: "By purchasing the two new 60120 machines, we feel very confident we will stay on top as far as competitiveness goes in the industry. Curio will be better prepared to produce and sell more varieties of machines, with the increased production."

In 1993, OMAX Corporation became the first company to make abrasive waterjet machining more precise, affordable and easy to use. It is now a leader in advanced abrasive waterjet systems and has made it possible for virtually anyone to go as far as creating high-precision complex 3D parts on its machines.

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Introducing FourJaw 2.0

Launching the next generation of accessible manufacturing analytics technology

FourJaw, the tech start-up behind the cloud-based 'fitness tracker' for manufacturing, has launched its next-generation machine monitoring platform designed as an operational tool to enable manufacturers to achieve big gains in factory floor productivity.

The new platform features a simplified and more intuitive dashboard design, enhanced mobile experience, powerful new work list imports and a dedicated reporting section, as well as hundreds of performance improvements.

Developed after more than 12 months of customer feedback and industry learning, FourJaw 2.0 launches with improved functionality and additional features to empower manufacturers with the information they need to understand, manage and improve their factory floor operations.

FourJaw co-founder and chief technology officer, Robin Hartley-Willows, says: "The feedback from our customers across the country has been invaluable, enabling us to create FourJaw 2.0: an operational tool developed to meet the needs of everyone in the business from machine operatives, cell leads, factory floor managers and managing directors."

Robin Hartley-Willows adds: "The big takeaway from the feedback is that manufacturers don't want huge quantities of data to interrogate and scrutinise. That would just mean more workload for people who are already very busy.

"What they need is an easy-to-use operational tool that guides them with the right information at the right time, helps them to manage the complexities of the factory floor and enables the continuous improvement process.

"We've learned over the last year what a difficult job our manufacturing businesses have, whether they're making brassware for kitchens or parts for the automotive sector. If every machine is making different components, with different tooling, materials and techniques at every hour of the day, you get a complex system which naturally leads to inefficiency and creates the productivity problem we all know too well.

"We have huge respect for the manufacturers we work with, who confront this complexity daily and we've built FourJaw 2.0 as a software tool to support them in managing their factory floor operations to achieve their productivity potential."

For existing customers, FourJaw 2.0 will be experienced as a seamless upgrade of the existing app. What they get, along with new customers, is an iterative tool that evolves to meet their needs.

Hartley-Willows concludes: "We founded FourJaw upon the belief that productive manufacturing elevates individuals, communities and our society. While FourJaw 2.0 is a significant milestone in our journey, it is also the foundation for our wider company roadmap that ends with every manufacturer achieving their productivity potential."

About FourJaw

FourJaw was founded in 2021 by Christopher Iveson and Robin Hartley-Willows and has its head office in Sheffield. The company is on a mission to deliver accessible technology that empowers manufacturers to achieve their productivity potential.

It has enabled this by creating an easily installed, low risk and affordable machine monitoring system that is designed for SME manufacturers.

FourJaw's plug-and-play system works with any and all machines, regardless of age or brand. It is a machine data analytics platform that is easy to use and purpose-built to help SME manufacturers increase productivity and their bottom line.

Its vision is to change the world of manufacturing with technology and innovation. The company believes that every factory deserves best-in-class digital infrastructure that is affordable and easy to use. It also believes that every manufacturer must engage in continuous improvement to compete in the Industry 4.0 age. Above all else, it believes that every operations manager should have accurate data in their hands to make the data-driven decisions that will drive the next significant step forward.

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Long term investment in PSL Datatrack proves a smart move

PSL Datatrack features a large number of standard reports in all of its production control software modules which help to provide users with essential planning and management information throughout their production process. Many customers are taking advantage of PSL Datatrack's customised reporting service covering areas such as job profitability and supplier performance.

One such company is Smart Turn of Northampton, that has called upon PSL Datatrack to write and promptly deliver a series of bespoke reports covering many different aspects of their business, including the value of work in progress, delivery performance and material stock/value.

The most crucial, however, has been a customised version of the standard Component Stocks Listing report detailing the drawing number, drawing issue, description, batch number, location, works order number and the quantity of all components currently in stock. "It's hit the nail on the head and has brought a real quantum change, saving us hours of work. The benefits have already more than exceeded the cost," comments Sean Crowley, director of Smart Turn.

A series of bespoke reports cover many different aspects of the business. Sean Crowley manages all of the company's manufacturing projects, covering the supply of quality assured valves, fasteners and other engineering components to the oil & gas industries. He has also fulfilled the potential of the original PSL Datatrack Quotations, Sales Orders and Finance modules acquired by the company.

This fulfilment meant the company was ready to add the Gauge Calibration, Job Costing, Scheduling, Shop Floor Data Collection (SFDC) and Tool Definitions modules. "These have helped us to succeed in our mission to provide the most economic manufacturing processes, achieving the expected quality standards within a time frame that exceeds customers' expectations," says Sean Crowley.

Smart Turn centres its production on a range of CNC machining centres, lathes, milling and turning centres and multi-spindle machines. Alongside these high specification machine tools and a major expansion in its workshop area, the company's long-term investment in PSL Datatrack will be key to future growth as it looks to diversify into new markets and services.

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SprintRay collaborates with BEGO to create new 3D printing resin for dental care

Dental technology company SprintRay has partnered with the BEGO Group, a leading specialist in prosthodontics and implant dentistry. The partnership has seen the creation of the SprintRay Crown, a 3D printing resin that is poised to improve the accessibility of custom dental care.

The new material is a ceramic-filled hybrid material for 3D printing permanent single crowns, inlays, onlays and veneers. SprintRay state that it allows dental professionals to provide budget-friendly custom restorations confidently.

The new material allows dental restorations to be 3D printed in dental professionals' offices at a fraction of the cost of other methods. It also saves time, as the printing process is under an hour long.

"With this new material introduction, SprintRay continues to shape the future of the dental industry, widening the reach and scope of digital technology," says Sumeet Jain, vice president of materials at SprintRay. "By reducing the cost and lead times associated with restorative procedures, we're enhancing dentistry for patients and doctors."

Thomas Kwiedor, head of business development for 3D Printing for BEGO, says: "Dental 3D printing solutions, especially for durable restorations, are becoming increasingly important. In addition to the excellent material properties and good aesthetics, are the low material costs, the speed in production and the customisability of the dental objects that makes SprintRay future-proof. The expansion of the partnership with SprintRay and the introduction of SprintRay Crown will further accelerate this trend."

SprintRay is a dental technology company that builds end-to-end 3D printing ecosystems for dental professionals. SprintRay produces solutions such as dental 3D printers, 3D printing software, curing technology, washing systems and innovative materials.

BEGO was founded in 1890. The German company provides dental technicians and dentists with devices, instruments, materials, implants, services and methods for the production and processing of dental restorations. The company has been using dental 3D printing with Selective Laser Melting (SLM) for over 20 years.

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KMF is a cut above the rest

KMF is committed to enhancing its service as metal fabricators and precision engineers. The substantial investments it makes in people, technology and processes allows it to meet customers' ever-changing needs with agility and efficiency. Having an end-to-end solution means that KMF is a first choice for manufacturers who are looking to procure volume sheet metal fabrications or volume precision machining.

From beginning to end, its extensive facilities offer all of the major processes that customers would expect a leading subcontractor to have in-house. Along with its 24/7 capacity, it can service the needs of large-scale clients while providing detailed job tracking throughout all of its manufacturing departments. KMF's customers depend on a quick turnaround, lower cost and strict quality control, as well as achieving optimum efficiency.

State-of-the-art technology, four ISO accreditations and extensive in-house capacity allows it to consistently meet the high-complexity demands of customers within exceptional lead times and to the highest quality.

Technological investment remains a focus of the business strategy, this means KMF Group has a plethora of stand-out machinery that only a handful of UK firms possess. A particular example is its TRUMPF TruBend Cell 7000 that offers a compact system for the high-quality repetition and efficient bending of small parts.

Across its three sites, spanning 255,000 sq ft, the company has invested over £9m into new leading-edge machinery and technological advancements in the last three years.

KMF Precision Sheet Metal UK facility

CNC machinery plays a critical role in sheet metal fabrication. KMF has two high performance TRUMPF TruLaser 3030 fibre lasers and two cost-efficient punch-laser combination TruMatic's, 6000 and 7000 that are all linked to its efficiency recording system.

The latest profiling technology provides increased accuracy and repeatability while reducing the time taken for post process finishing, even on heavier gauge materials. These innovative combination machines give KMF the ability to manufacture components that require both precision

laser cutting and metal punching in a single process.

KMF constantly replaces and upgrades its three TruPunch 5000 machines which are fed by their own vertical storage towers, setting new standards in terms of productivity, process reliability and flexibility. Its automated TRUMPF machinery reduces the need for individual operator input and therefore offers significant cost advantages over stand-alone machines. In addition, all profiling machines are pre-programmed offline for each production run, further reducing the cost-per-part.

The latest investment in two TRUMPF fibre laser machines linked to a dedicated Trustore sheet management system ensures that it can accurately and reliably cut a wide range of materials. This includes mild steel, coated steels, stainless steel, copper, and aluminium in sheet sizes up to 3,000 x 1,500 mm. All products that are produced on the laser and punching machines are fully verified using two Virtek LaserQC® scanning systems. This ensures full compliance against customers' requirements.

Moving through the facility, two Salvagnini P4 panel benders represent a significant investment in automated folding. They provide the ultimate solution in the forming of large panel type parts, such as doors or cladding panels. They use universal bending tools, removing the need for manual re-tooling, resulting in very fast changeovers and reduced downtime. Salvagnini's adaptive technology means the system can detect subtle material changes and compensate by adjusting within the bending cycle, for increased accuracy and high repeatability.

Across to the manual folding section, there are nine dedicated TruBend 5000 press brakes which are each manned by an experienced folding operator. These machines give KMF unrivalled flexibility due to their innovative features such as fast tool change, 3D visualisation, 5- and 6-axis back gauge systems and full offline programming using Radbend software. For smaller parts, the TruBend 7036 machine boasts both efficiency and space-saving properties, offering high-speed performance.

At KMF, ongoing customer relationships have allowed it to provide dedicated customer cells in its facility. Whatever your industry or product, it can engineer a

solution and can adapt its sheet metal fabrication and engineering processes to fit your needs.

In the welding areas there are twenty welding bays which operate with both MIG and TIG systems across a 24 /7 production pattern. All bays are equipped with safe systems of work regarding fume extraction and are fitted out with purpose designed welding tables that accept quick clamp fixturing.

After linishing and dressing back in the six air-extracted bays, parts typically divert along different routes after welding with options to move on to ten state-of-the-art Haegar hydraulic inserting machines. Alternatively, parts may reach the in-house glass bead blasting or silk screening and pad printing facilities, which are all dependant on the customers' exact requirements.

The powder coating line is next, where the fully automated, electrostatic GEMA Automatic powder coating booth system operates 24/7. The system is inclusive of a high-efficiency curing oven, conveyor system and QCS4 Magic cylinder fast colour change booth.

Standing KMF apart from competitors, it applies an Oxsilan pre-treatment to fabricated metal products which is free from hazardous chemicals. It gives superior corrosion resistance and ensures better environmental endurance for a wide range of metal substrates.

Next, for integrated cabinets, multipart components and mechanical assemblies it has purpose-built assembly cells and packing areas, meaning that customers have full confidence that the products have been quality checked before dispatching.

For fully configured turnkey solutions, customers can also benefit from bespoke electro-mechanical integration facility.

KMF advanced solutions facility

Moving across to the stand-alone advanced solutions facility, the company offers the capacity and control for more complex components especially those that require full material and process traceability. For aerospace and medical customers, the laser part marking machine and Kardex material management shuttle tower, that can only be accessed via barcodes contained within the job routing documentation, both help to provide the full control that's required for these specialised industries.

For high tolerance measuring of detail components, this facility is also equipped with the latest CMM technology in the form of a digital measuring arm.

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Bringing new levels of tube bending innovation to FABTECH 2022

Unison Tube LLC, the North American division of UK-based Unison Ltd, will present a number of innovative tube manipulation technologies at FABTECH, North America's largest metal forming, fabricating, welding, and finishing event.

Unison machines on show will include an all-electric Breeze Twin Head tube bending machine and one of the company's all-new Synergy hybrid, multi-stack tube benders. Unison will also use the event to launch the most advanced version ever of its leading Opt2Sim tube bending simulation software, with several free software licenses up for grabs.

Unison all-electric Twin Head machine

Equipped with Unison's recently upgraded Unibend control, an operating system offering speed enhancements of up to 25 percent, all-electric Unison Twin Head 1 ½, maximum tube diameter, machines will precision bend two ends of a tube simultaneously. This capability makes them well suited to the high-speed manufacture of symmetrical tubular shapes typically found in automotive, agricultural and furniture applications.

New Unison Synergy hybrid machine

Officially launched at the MACH machine tool show earlier this year, Unison's new Synergy machines combine electric and hydraulic operation with exceptional levels of control. Developed for organisations that aspire to Unison quality but carry out repetitive tube bending tasks, Synergy models provide a highly accessible entry point into the Unison range. Available in 2", 50 mm and 3", 80 mm, versions, Synergy machines feature a servo-driven bend arm, carriage, plane of bend and carriage side shift, with a hydraulically controlled mandrel, pressure die and clamping system. This is a combination that Unison believes make its Synergy range perfect for high volume, repetitive tube manipulation operations.

New Opt2Sim tube manipulation software

Continuous innovation has ensured that Unison Opt2Sim remains a favourite tube manipulation software program among users of Unison and other brands of tube bending machines. In this latest iteration of Opt2Sim, Unison makes it easier than ever to import and extract tube data and includes software versions that take simulating the bending process, creating batch files and scanning tube coordinates to the next level. Opt2Sim provides users with a complete end-to-end solution, from taking 3D STEP files to bending tube within a single software suite. Delegates visiting Unison's FABTECH booth will have the chance to win one of several Opt2Sim software licenses.

"We are delighted to be returning to FABTECH with such inspiring tube bending technologies," comments Unison tube's vice president, Stuart Singleton. "As industry returns to pre-pandemic levels, our aim is to help as many manufacturers and subcontractors as possible accelerate their efficiency, ingenuity and productivity. We are particularly excited to be unveiling our latest Opt2Sim software, as this really will revolutionise tube bending simulation for organisations of all sizes."

Unison Tube LLC is the North American division of Unison Ltd, the UK manufacturer of tube and pipe bending machines, offering the largest range of all-electric benders for diameters from 5/32", 4 mm, to 10", 275 mm, schedule pipe. With a reputation for building highly powerful, highly robust machines that deliver uncompromising levels of accuracy and repeatability, Unison continually innovates the tube and pipe bending marketplace.

The company manufactured the world's first all-electric tube bender in 1994, followed by the world's first all-electric multi-stack tube bender, then the world's largest all-electric tube bender for the shipbuilding industry. Available in single-stack, multi-stack and right/left varieties, Unison machines are delivered to more than 20 countries globally. Unison's tube bending software is recognised as the most user-friendly control system for tube bending machines. The software is written and supported by Unison, ensuring complete control of its evolution, with no need for third party support.

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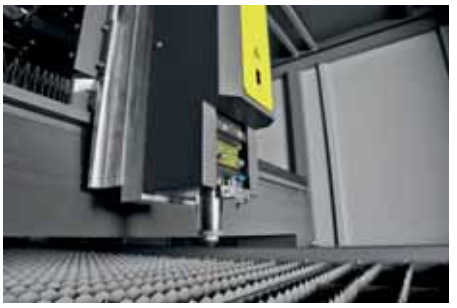
ETG introduces fibre laser brand to UK and Ireland

Renowned for the breadth of its technology offering, the Engineering Technology Group (ETG) is now extending the scope of its brand even further with the addition of fibre laser technology. Announced as the exclusive UK and Ireland distribution partner for DNE Global, ETG has added high-quality cost-effective fibre laser cutting to its portfolio of products and services.

As would be expected from a Swiss brand, owned by a leading sheet metal processing technology provider, the state-of-the-art laser cutting technology from DNE Global has the uncompromising quality and innovation is instilled into every facet of its products. Differentiating its market position from rival brands, DNE's laser cutting solutions deliver extremely high performance at an attractive price point.

Commenting upon this new partnership, ETG's group managing director Martin Doyle says: "For some time we have wanted to enter the highly competitive laser cutting market segment, as pockets of our vast customer base have requested this



technology. However, we needed to find a suitable technology partner that could deliver uncompromising quality with industry-leading technology at a price point that would set us apart from potential competitors. With DNE Global, we can confidently announce we have identified a brand that fulfils these criteria points once again giving ETG and its team a solution that the industry has been looking for. The quality and technology behind the machines are first-class and we are excited to introduce the DNE Global brand to the UK and Ireland."

With ground-breaking cutting technology incorporated into the DNE Global machines, the range is perfect for creating precise, high-quality cutting with uncompromising edge quality that is ideal for a diverse range of industries. For more information on how you can take your sheet metal processing to the next level, contact your local ETG representative.

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Steel stockholder automates sawing centres

German storage and sawing equipment manufacturer KASTO has upgraded a pair of sawing cells at the Dornbirn centre of Austrian steel stockholder and distribution company EHG Stahlzentrum. All parts of the systems, from raw material supply to handling of containers and pallets of finished goods, have been integrated and automated.

Efficiency in the processing of orders and in logistics is part of the success of EHG's business model. About 620,000 orders are handled each year, primarily in small batches of less than ten items. Head of logistics systems and processes, Christian Rüf says: "It poses quite a challenge. We are often under enormous time pressure, as in some cases we only have one to two hours to complete an order."

To alleviate the problem, EHG utilises advanced storage and processing technology. The Dornbirn site has eight automatic high-bay storage systems, 40 stand-alone automatic bandsaws and circular sawing machines and two sawing centres integrated with high-bay storage so that they receive material automatically. It is these systems that have been upgraded with robotic handling and sorting.

For many years the stockholder has relied on products and expertise from German firm KASTO in Achern, whose UK subsidiary in Milton Keynes provides a similar range of services. They encompass automated storage systems for long stock and plate, machines for sawing the materials, robotic and other handling solutions and the requisite software, all from a single source.

Christian Rüf says: "Our high-bay storage systems are all from KASTO. They include four UNICOMPACT honeycomb systems for storage of bars, tubes and profiles, as well as another for holding sheet metal. In addition, 27 KASTO automatic saws are in operation in Dornbirn, ranging from production circular saws to heavy-duty block and plate bandsaws."

In the two automated KASTO sawing centres, all process steps are now carried out without any operator intervention, from feeding the raw material from the store to sorting and stacking the cut pieces. The ability to change over to a new material quickly allows small batch sizes to be processed efficiently. Automatic supply of material by the gantry crane of a UNICOMPACT warehouse directly to the saws eliminates operator fatigue and the risk of injury, bearing in mind that stock is up to six metres long and very heavy.

Upgraded sawing centres

EHG originally commissioned the first of its two sawing centres in the year 2000. This system was expanded in 2019.

Christian Rüf states: "After about 20 years of service, the circular saw in our original sawing centre had reached the end of its service life and required replacement, so we purchased a new KASTOvariospeed high-performance model.

"At the same time we decided to invest in additional automation to make our processes even more efficient and unsurprisingly KASTO, as a preferred supplier, was chosen for the project."

He explained that an industrial robot was added to remove automatically the cut pieces from the working area of the saw using a variety of interchangeable grippers. It then deburrs the parts and sorts them according to the customer order, placing them in six different sizes of cardboard or plastic box that arrive via individual inclined roller conveyors. Empty boxes, chosen based on the order data, are placed by the robot with the help of a suction device into a wooden pallet before the robot starts to fill them with parts.

While the sections are being cut and stacked, a printer creates a delivery note for the order and the robot places it in the pallet using the suction device. Once a pallet is filled the floor-level carousel on which it sits, consisting of eight stations on a rounded rectangular track, indexes to make the next load carrier available. The pallet with the completed order is transported by forklift or hand pallet truck to the shipping department and later returned. The ability to have a buffer of up to eight pallets on the carousel allows the sawing centre to run autonomously over an extended period, for example overnight.

The sawing centre's control system is connected to EHG's warehouse management system via an interface created specifically for the purpose.

Christian Rüf explains: "It allows us to generate and process orders fully automatically. We benefit from controlled and managed material flow, with little

human intervention required throughout the process, from incoming order to outgoing goods."

KASTO's automation solution impressed EHG to such an extent that in 2020 the stockholder upgraded a second sawing centre purchased in 2007 with similar new technology.

Christian Rüf continues: "The primary reason was that we wanted to expand our existing high-bay storage system and at the same time create an additional order picking hall. The new sawing cell is integrated into our facilities in such a way that it can independently access stock from two storage areas."

It is equipped with a high-performance automatic circular sawing machine

KASTOgripspeed C 10, designed for fast, precise cutting of various grades of steel. This second sawing centre has also been equipped with a handling robot, gravity feed conveyors and a pallet carousel.

Christian Rüf says: "Having one company manufacture and supply all this storage, sawing and handling equipment gives us the advantage of a single point of contact in case we have any questions or concerns.

"If a system should malfunction, KASTO engineers can connect via a remote maintenance link and quickly provide assistance to avoid expensive downtime, however, this is rarely needed.

"The sawing cells are extremely reliable and easy to operate. They are a true asset to our company, enabling us to complete our work faster, better and more efficiently."

Holding a stock of around 45,000 tonnes, EHG offers a range of goods including more than 15,000 items of steel and other metals in over 140 grades and countless dimensions. It makes the facility one of the largest in Europe and ensures a high degree of availability.

Being able to provide a wide range of services is just as important to EHG as holding a large variety of stock.

Christian Rüf concludes: "We don't think in terms of products, but rather in terms of solutions. It means that we supply directly to our customers' production facilities items already cut-to-size and just in time."

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Which bandsaw blade type is best for aluminium cutting applications?

Knowing what bandsaw blade type will be able to offer you the best possible performance within your upcoming aluminium cutting application can be a challenging task. Opting for the wrong choice can potentially causing breakages and other similar problems later down the line. It is vital that you go for the blade best suited to the material you are to be working with, allowing for the best results from your industrial bandsaw machine. Below, we have compiled a list of the metal cutting band saw blades best suited within aluminium application, helping you to find your best option with ease.

Carbon Flexiback Bandsaw Blades

Carbon Flexiback Bandsaw Blades are an ideal choice to opt for, offering up great results when used in applications upon soft metals, such as aluminium and other general-purpose cutting projects, like those involving plastic, wood, foam and various non-ferrous metals. Carbon Flexiback Bandsaw Blades offer up a great economical option when compared to other blade types currently available on the market, also offering users the best variety in terms of the width, thickness and tooth specifications of the blade in question. Carbon Flexiback Blades are seen to be ideal within both contoured and straight industrial cutting applications, making them highly versatile and therefore great for a range of numerous applications.

M42 Bi-Metal Bandsaw Blades

Alternatively, M42 Bi-Metal Bandsaw Blades also offer up great results when used within projects involving aluminium, as well as various of other materials such as alloy steels, carbon steels, stainless steels and structural steels. This makes it a very versatile option in contrast with other blade types currently on the market. The saw blade type provides a higher level of cutting accuracy, reducing cutting time by up to 50 percent. The M42 Bi-Metal can also be used within a variety of non-ferrous metal cutting applications.

Carbide Tipped Bandsaw Blades

Carbide Tipped Bandsaw Blades are also a great choice to opt for within aluminium cutting applications. They are ideal for use in a range of abrasive building materials such as cast iron, concrete, graphite and fibreglass. This industrial bandsaw blade type also tends to hold a much longer lifespan when compared to other options due to its resistance to heat wear and abrasion.

While there is an array of different industrial bandsaw blade types currently available to users on the market, choosing the right option is a potentially challenging but highly important task. For guidance on choosing the best blade option for your bandsaw machine, get in touch with the experts at Sawcraft.

Based in the West Midlands, Sawcraft UK Ltd supplies a comprehensive range of quality sawing machines, cutting tools and saw blades to an established customer base throughout the UK and Europe.

Privately-owned since formation in 1990, its highly-skilled and knowledgeable team, with over 30 years' experience in this industry, has built a reputation for personal service, reliability and quality.

It prides itself on working hand-in-hand with each customer to ensure that you take away the product that is right for you. It is a dedicated team with all the technical expertise required to formulate cutting solutions to meet individual sawing needs.

Sawcraft UK supplies and maintains Cosen and FMB bandsaw machines as well as Noritake high-production circular sawing machines. It also supplies a full range of circular sawblades for all types of cutting needs. It has built strong relationships with suppliers and you can be assured of excellent after-sales service well in to the future.

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