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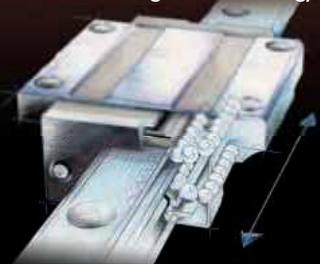
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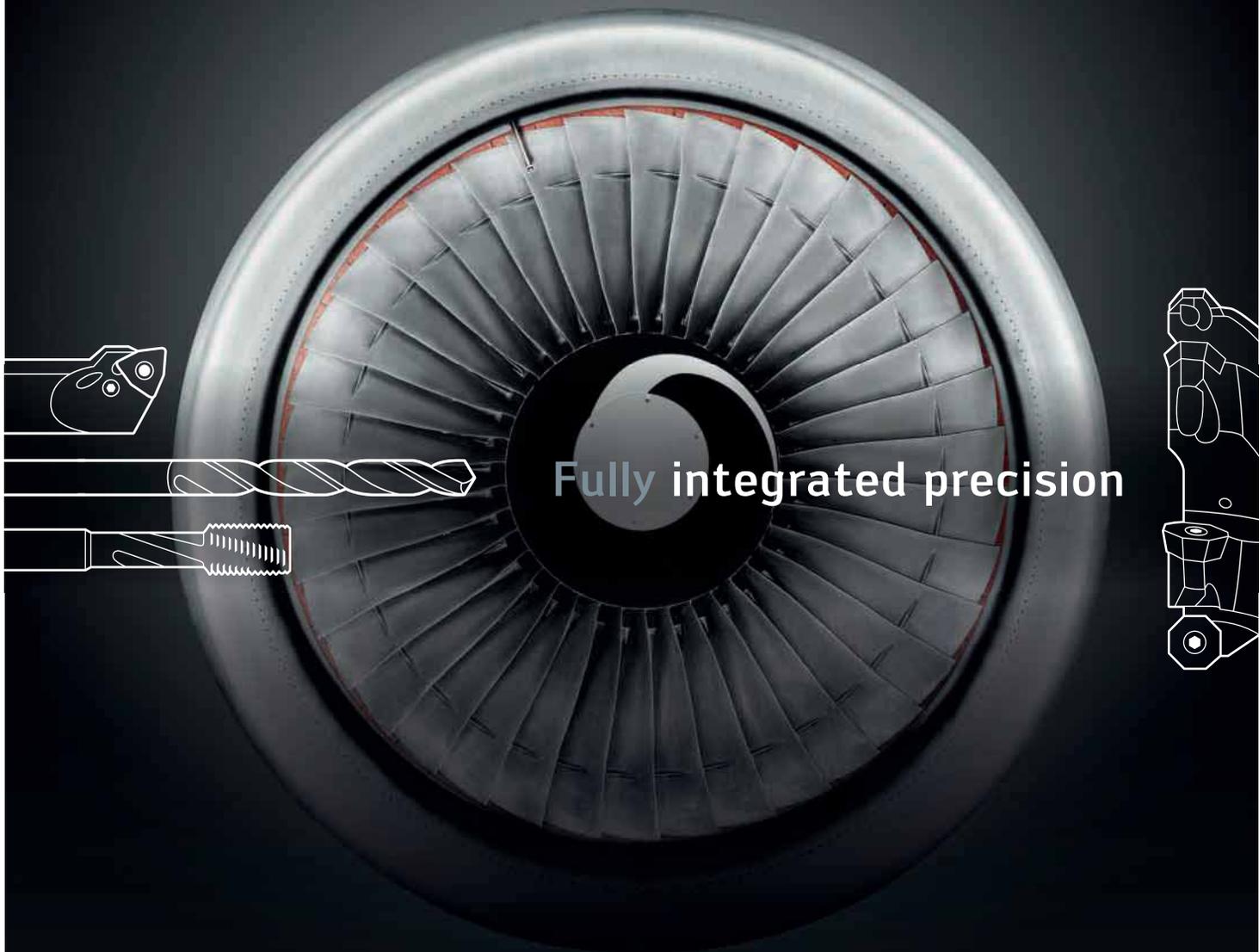


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- ADVANCED MANUFACTURING REPORT
- DUST & FUME EXTRACTION • EDM
- LUBRICATION • WELDING

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1st MTA launches workholding and positioning systems

At MACH 2020, 1st Machine Tool Accessories will demonstrate an extensive selection of workholding products from its sole agency CHICK range, which is manufactured in the US. They will include the System 5 Qwik-Lok (www.1mta.com/product/system-5-qwik-lok) dual station clamp for maximising productivity and minimising tool changes, as well as the Indexer Sub System (www.1mta.com/product/chick-indexer-sub-system-iss), which combines a Multi-Lok tooling column with a 4th axis rotary table on a vertical machining centre.

CHICK's One-Lok clamping system will also be in evidence. A superior alternative to a conventional wind-up vice, its moveable jaw can be slid quickly over ratchets with one hand, after which clamping only requires a few turns of the handle. At the show, it will form the base for securing a new, UK-manufactured workpiece positioning system, RotaVice.



The RotaVice indexing head from 1st MTA secured in a CHICK One-Lok using a special jaw

The manually adjustable indexing head, mounted in a special jaw in the One-Lok, can be rapidly set to position a component at a multiplicity of angles in the horizontal plane for milling and drilling. The workpiece is secured using different workholding options including a 3-jaw chuck. The system is ideal for production shops where manual mills may still be in operation but is equally well suited to use on CNC vertical machining centres (VMCs).

Adjusting the angle is rapid and accurate. It is effected by turning a circular locating plate to the required angle and inserting a pin into the relevant hole, an array of which are pre-drilled into the plate at the most common angles. In the standard configuration, 5, 10 and 45 degrees are available. The standard plate can be changed for a specific version to suit any job that involves the use of non-standard angles.

Also will be the new Kitagawa Swift Klamp, a rigid workholding product that uses the proven HSK tool interface to provide a secure, low interference, quick-change clamping arrangement that resists bending forces generated during metal cutting operations.

Designed for 5-axis machining applications but equally suited to use on 3- and 4-axis machines, the system consists of three parts: clamping head, workholder and workpiece. The head is supplied either as a manually or automatically operated HSK A40, A63 or A100 clamp, while the workholder comprises an HSK interface at the base and multiple options at the top for holding the workpiece, including flange clamps and side clamps.

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MACH Stand: 19-302

Bruderer UK's order book boosted by end of political uncertainty

Investment in manufacturing is on the rise following the General Election according to one of the UK's leading suppliers of precision high-quality stamping and forming technology.

Bosses at Bruderer UK are predicting a buoyant 2020 after it revealed a £3 million pipeline of projects that include the installation of the latest precision high-speed stamping presses and one high tonnage Zani machine for clients involved in the aerospace, automotive, construction and renewables sectors.

Managing director Adrian Haller believes that a majority Government has helped to remove some of the uncertainty shrouding industry and his firm is looking to take advantage of new opportunities, creating up to five new jobs across its engineering and administrative departments in the process. This will include significant investment in developing a number of apprentices, ensuring the young staff absorb the company culture and soak up the experience and knowledge of experienced engineers that collectively have hundreds of years' experience in presses, servicing and maintenance.

"We move into 2020 with a very healthy order book, which reflects the positive attitude of our customers following the Election results in December," explains Adrian Haller. "The high-speed stamping technology we have provided in the UK for over 50 years is perfectly suited to where many growth sectors are moving, meeting the client's demand for greater production control, more versatility, repeatable quality and, importantly, speed and precision.

"Electrification is a market that is due to take off after a number of stalled starts and we are currently in the process of tooling up suites of tools for major automotive suppliers in preparation for EV product launches. 2020 could well be the breakthrough year."

Bruderer UK, which employs 14 people at its headquarters in Luton and at a satellite facility in the Black Country, enjoyed a robust 2019, shaking off economic volatility thanks to a surge in major rebuilds on existing presses. Due to the durability of the firm's machines, a lot of customers took



softening in some markets as an opportunity to bring their reliable presses back to 'as new' in the form of in-depth refurbishments, so they could optimise performance in time for the upturn.

"I think 2020 will be very different, with a lot of investments coming to fruition after being stalled for months. There will be significant interest in the latest updates in technology, including Single Minute Exchange of Dies (SMED) and state-of-the-art controls that mean up to 1,000 tool store operations can be accessed and applied via a single touch," continues Adrian Haller.

"Industry 4.0, which has been integrated into our machines for over a decade, will also be in big demand as the clamour for real-time information and customer transparency across the entire production process grows.

"Finally, we are investing in die laser welding, vision system technology and, along with our portfolio partners, enhancements to servo roll feeders, decoiling systems and tool components for plastic and metal tools.

"Our role is to make sure we give UK manufacturing the best possible support in technology and innovation to make 2020 a great year."

Bruderer UK, which enjoyed an extremely successful Autosport International exhibition, is setting its sights on its biggest presence at a MACH show yet, where it will be showcasing its full portfolio, together with a precision high-speed stamping line, to thousands of delegates.

Bruderer employs some 500 people all over the world, 390 of whom work at its Frasnacht site in Switzerland, where all its high-performance stamping presses are produced. 95 percent of the company's products are manufactured for the export market. Sales and service organisations located all over the world combine with the company's own skills centres, for example in Asia, to ensure direct contact with customers. The company is facing the challenges of the 21st century with the very same attributes that have made it great since its foundation.

For further information, contact:

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MACH Stand: 20-629

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SCHUNK gripper plays a central role in AMRC Wales opening ceremony

In December, the University of Sheffield officially opened its Advanced Manufacturing Research Centre (AMRC Cymru), a £20m state-of-the-art research and development facility in North Wales. As a member of the AMRC, SCHUNK UK played an integral role in the opening ceremony, holding the ceremonial ribbon with a SCHUNK gripper for Wales' First Minister Mark Drakeford to cut it.

Described by Welsh government ministers as a 'game changer' for the economies of Wales and the Northern Powerhouse, the AMRC Cymru is a purpose-built research and development facility close to the Airbus wing manufacturing plant in Broughton.

It was officially opened by First Minister of Wales Mark Drakeford and Economy and North Wales Minister Ken Skates, who accompanied Professor Koen Lamberts, president and vice-chancellor at the University of Sheffield, on a tour of the new building to see the new technologies that will be available to manufacturing companies across Wales.

Situated in the Deeside Enterprise Zone, the facility will operate from a 2,000 sq m² open access research area focus with a focus on advanced manufacturing sectors such as the aerospace, automotive, nuclear and food. This region has a strong manufacturing base and AMRC Cymru will build on this, driving world-class research and expertise across the supply chain. It is predicted the new facility could increase Gross Value Added (GVA) to the Welsh economy by as much as £4 billion over the next 20 years.

Holding the ceremonial ribbon for the First Minister was a SCHUNK Co-act gripper attached to a Kuka Cobot that was mounted on a Kuka AGV. The new SCHUNK EGH Co-act gripper is the latest addition to the SCHUNK Co-act gripper family and is a flexible system for gripping and moving of small to medium-sized workpieces in the areas of handling, assembly and electronics.

The long stroke of the SCHUNK EGH Co-act gripper can cover a very wide range of workpieces, as the gripper fingers are particularly suited for positioning over the entire stroke. The robust parallel movement



of the fingers ensures constant gripping force at a position over the entire stroke. Quick and easy to assemble, there is no height compensation required for the robot. The design of the SCHUNK EGH Co-act gripper enables the gripper to be attached to the robot quickly and easily as the included adapter plate is attached to the robot flange using the supplied fastening material. Subsequently, due to the assembly quick-release fastener, the gripper can rapidly be attached to the adapter plate with the enclosed hexagon socket wrench.

The final step is to establish the electric connection and a starter kit is available for quick and easy installation of the SCHUNK EGH Co-act gripper. This contains all the necessary components to successfully mount the gripper onto the robot and to put it into operation. In essence, the new system offers long and freely programmable stroke for flexible workpiece handling with a gripping movement that incorporates parallel kinematics for constant gripping force over the entire stroke length.

With fast commissioning, programming and simple use of an intelligent servo gripper due to the 'Plug & Work' starter package, the SCHUNK EGH Co-act gripper offers optionally attachable flexible fingers for increased flexibility. This also increases the gripper's range of application.

SCHUNK was founded in 1945 by

Friedrich Schunk as a mechanical workshop and has developed under the leadership of his son, Heinz-Dieter Schunk, to a competence and leader for gripping systems and clamping technology. Today, the company is run by the third generation, siblings Henrik A. Schunk and Kristina I. Schunk, the company founder's grandchildren.

With 3,500 employees in nine plants and 34 directly owned subsidiaries together with distribution partners, in more than 50 countries throughout the world, an impressive marked presence is ensured. By way of its 11,000 standard components, SCHUNK offers the world's largest assortment of gripping systems and clamping technology from one source and, with 2,550 SCHUNK grippers, the largest product range of standard gripper components on the market. The entire gripping system portfolio comprises more than 4,000 components.

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MACH Stands: 20-360/362

Dugard becomes new UK distributor for IBARMIA

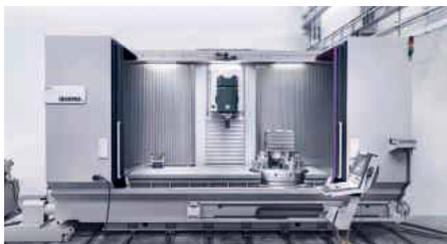
As part of its relentless and exciting growth strategy, Dugard has now become the sole UK and Ireland agent for the high-quality range of IBARMIA 5-axis moving column machining centres. The new partnership is the result of increased UK interest in the 5-axis moving column machining centres manufactured by the renowned Spanish brand.

IBARMIA has enjoyed significant growth across Europe, North America and Asia, witnessing a huge upswing in interest from UK manufacturers at numerous international machine tool exhibitions. With IBARMIA acknowledging the strong interest from UK engineers enquiring about the wide range of machine tool solutions and technology, local representation and technical support; the Basque Country manufacturer set about finding the best established, most reputable and well recognised brand in the UK, confidently turning its attention to the Brighton machine tool experts.

The level of interest from UK manufacturers led IBARMIA to analyse the possible distribution channels with the aim of selecting a company with a strong network of coverage and service support to ensure all companies receive first class products with first class service.

IBARMIA's area sales manager for the UK, Ignacio Mera says: "IBARMIA is now a leading world reference in moving column machining centres and universal machining centres. Through working together with Dugard, engineers in the UK, we will now have the opportunity to invest in the highest level of technology with the best local service support. We are excited to bring the success of our solutions to the UK and we are confident Dugard is the perfect partner for it."

Managing director Eric Dugard enthuses: "We are delighted to be appointed as the exclusive dealers for IBARMIA. In recent years, we have been aware of just how successful the IBARMIA brand of machines have become in the European, North American and Asian machine tool markets. With a full line up of 3-, 4- and 5-axis travelling column machines



from 1.5 m to 12 m with complete turning capabilities, the flexibility, capability and opportunities for UK manufacturers are evident. Manufactured in the Basque region of Spain, an area renowned for its

heavy-duty machine tool building and innovation, the IBARMIA range will certainly give Dugard and its customers, machine tool capabilities and flexibility far beyond that of anything else seen in the UK."

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Made Smarter engages with MACH 2020 as a great place to connect SMEs with their digital journey



The MTA has announced that the Made Smarter programme will be exhibiting at the UK's national manufacturing showcase. Its stand at the exhibition will look to help SMEs start their digital journey.

The Made Smarter North West pilot is already working with SMEs to help them introduce digital tools and technologies to boost productivity and growth. So far, 300 North Western small and medium sized manufacturers have secured support, including specialised advice and £1.6M of funding, in the first year of the programme.

The North West pilot is being overseen by the Made Smarter Commission; a partnership between the Department for Business, Energy & Industrial Strategy (BEIS) and industry leaders.

The programme aims to kick start a new industrial revolution for the manufacturing sector and turn the country into a world leader in digital technologies. These technologies can help close the productivity gap in the UK and cost effectively boost production.

The Made Smarter team is looking to



James Selka, DL, CEO of the Manufacturing Technologies Association

implement what they have learnt in the North West Pilot to help roll the scheme out to other areas and regions of the UK.

Made Smarter is bringing this help and support to MACH 2020 in order to reach even more makers and signpost them towards taking their first steps into Industry 4.0.

James Selka, DL, CEO of the Manufacturing Technologies Association which organises MACH, says: "We are delighted to welcome Made Smarter to MACH 2020. We have been a huge supporter of the initial review and subsequent launch of the North West Pilot. Our members and exhibitors create the technology that will power this new industrial revolution.

"MACH 2020 is the perfect platform to reach out to manufacturing and engineering firms, with a readymade audience who are set to benefit from the advice and support the Made Smarter Program has to offer. We know the benefits SMEs across the UK will get from adopting cutting edge digital technology to help them boost productivity and take manufacturing forward in this county."

Donna Edwards, director of the North West Made Smarter pilot, states: "In its first year, Made Smarter has helped 300 SME manufacturers and we are keen to build on that success. MACH 2020 provides the perfect opportunity to showcase these achievements and encourage other SMEs to start their digital journey.

"Our stand will illustrate what technology has done for hundreds of manufacturing businesses and what it can do for you. Our specialist advisers can talk through your business challenge, help you understand the opportunities, and talk through the next steps."

MACH 2020 will take place from 20th to 24th April 2020 at the NEC in Birmingham and you can find Made Smarter in Hall 6. Visitor registration is now open at **www.machexhibition.com**

Registering to attend MACH 2020 before the event will make it easier for attendees to gain access to the show and cut down on waiting times entering the NEC. All registered visitors will receive regular



Donna Edwards, director of the North West Made Smarter pilot

updates about the show and a pre-registration pack, which contains show guide, fold out floorplans, ID badge and a product guide when they get to the exhibition.

Made Smarter is the UK national industrial digitalisation movement to drive productivity and growth of manufacturing industries and put the UK at the forefront of the 4th Industrial Revolution. Backed by world-renowned businesses and working in partnership with the UK government, Made Smarter will make a real, everyday difference to people from the boardroom to the factory floor.

Made Smarter was formed following a nationwide review into UK manufacturing that recommended key changes including more ambitious leadership, greater innovation in developing new technologies, faster implementation and adoption of these technologies and a deeper understanding of the sector's skills requirements. It is boosting digital skills in the sector, bringing businesses and R&D together to develop new technology and helping makers embrace new digital tools. In doing so, it will inspire the next industrial revolution and make the UK a leader in digital technologies.

For more information, visit **www.madesmarter.uk**



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- See the latest machines in action, demonstrating how new technology can reduce costs, increase productivity and improve quality
- Discover which digital solutions will improve the everyday performance of your business, helping you work smarter
- With over 600 exhibitors and 25,000+ senior industry professionals, MACH 2020 showcases the manufacturing sector's latest products and services, providing easily implementable solutions to improve competitiveness
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Star GB to demonstrate applications excellence

The latest sliding head technology on show at MACH

Sliding headstock lathe supplier Star GB is delighted to once again be exhibiting at MACH with exciting plans to showcase the very latest in machine tool technology, as well as to educate engineers on the diversity and capabilities of its machinery.

With the increasing prominence of sliding head technology throughout the UK, existing and prospective users will have unprecedented access to process demonstrations and an exclusive look at components being produced live at the event.

The technology on display will comprise the brand-new SX-38 sliding head lathe first shown in the UK at Star's annual Open House event in October 2019. In addition, an array of the company's most popular machines including the ST-38, SR-38 Type B, SR-32JII Type B, SR-20JII Type B, SR-20RIV Type B, SB-20R Type G and SW-12RII will be on show. An SR-32JII Type A will also be featured on partner company Floyd Automatic Tooling's stand in hall 20.

Each machine will be equipped with Star's High Frequency Turning (HFT) swarf control software, developed to increase machine efficiency on difficult-to-chip materials. HFT works on any linear axis on any channel and is the only chip-breaking software of its kind which is capable of being fitted to both new and older Star models dating back to 1996.

On the stand throughout the week will be Star's applications, service, sales and marketing teams to share their technical knowledge. The team will be available to give visitors an introduction to Star machinery and offer advice on getting the very best out of the technology on show. Star's engineers will also be demonstrating how quickly and efficiently CNC programs can be generated via the company's popular NC Assist and PU-JR programming editors, each offering simple conversational interfaces with a range of useful pre-installed templates.

Displaying the latest technology in the rapidly expanding automation market, a FANUC pick-and-place robotic cell, developed in conjunction with Renishaw's post-process Equator™ gauging system, will also be on show. The cell will be demonstrating how components can be machined and inspected with minimal



operator intervention, while automatically adjusting tool offset data to ensure maximum accuracy.

Stephen Totty, managing director of Star GB, says: "MACH is a key event for us as it allows visitors an opportunity to see our technology in action and get to know our team, which is very important to us as our emphasis on customer service is what sets us apart.

"Demand for more complex applications and improved process efficiency continues to increase and MACH gives us the ideal platform to demonstrate the production capabilities that are possible with sliding head machines.

"This year we have the additional bonus of being situated amongst some of our core partners. This means not only are we able to demonstrate Star technology on our stand, but we can also show visitors how our partners can be utilised to further increase automation, lights-out running and process control."

Star is pleased to welcome all visitors with an interest in manufacturing.

Star Micronics GB Ltd is the wholly owned UK and Eire subsidiary of Star Micronics Co Ltd, which produces sliding-headstock lathes at its ultra-modern Kikugawa plant in Japan with its headquarters located in Shizuoka.

The GB subsidiary, in addition to supplying its parent company's multi-axis, sliding-headstock mill-turn centres, is also the sole UK agent for the entire range of FMB automatic bar feeders and JBS compensating guide bush systems from Germany.

Its engineering team works closely with customers to develop and enhance production processes on Star equipment. From cutting data recommendations and engineering bespoke toolholders to providing customised CNC macro programs, the experienced team are available to assist customers with their most challenging applications.

Star GB's reputation for delivering successful turnkey solutions is well founded. For years, its leading-edge technology combined with its knowledge, experience and pragmatic approach to problem solving has benefitted many companies across many industry sectors.

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XYZ Machine Tools unveils turning centres at MACH

XYZ Machine Tools will use MACH to reveal the latest additions to its Compact Turn turning centre range, the XYZ CT65HD and the XYZ CT52LR. The XYZ CT65HD replaces the existing Compact Turn CT65 and comes with enhanced turning capacity with maximum turned length more than double its predecessor at 535 mm, with a total z-axis travel of 550 mm. Another addition is the increased coolant delivery pressure, which now runs at 30 l/min at 2.5 bar. The HD designation relates to the CT 65HD's construction, which remains as a solid Meehanite ribbed casting with x and y axes positioned along hardened and ground box slideways by means of ballscrews that have been increased in size to 28 mm and 40 mm respectively, with 20 m/min feedrates. The spindle remains as a 23hp/18k W, with a maximum speed of 4,500 revs/min. The 12 position 30VDI turret remains as standard along with the MT4 tailstock with 90 mm of travel.

The arrival of the XYZ CT52LR mirrors the development of XYZ Machine Tools' machining centre range, with the introduction of linear rail technology to its turning centres for the first time. Providing a 300 mm maximum turned length and 52 mm bar capacity, the XYZ CT52LR provides users with the perfect entry into turning centre ownership and, when combined with a machining centre from XYZ's LR range, delivers a highly price competitive package for any subcontractor that is unsure of what work will come in from week-to-week. Other key specifications of the CT52LR

include its 15 hp/11.2 kW spindle capable of running at 4,500 revs/min, 300 mm maximum swing, 180 mm maximum turned diameter and axis travels in x and z of 165 and 315 mm respectively with a 10 position block-type turret providing plenty of machining options.

In addition to these two brand new developments, XYZ will also be highlighting the latest version of its ProtoTRAK control for its mills and lathes. The ProtoTRAK RX control sees several major developments, not least the use of a 15.6 inch touchscreen control that allows the now familiar 'Pinch to Zoom', 'Twist to Rotate' functions creating a much more user friendly interaction for the operator, especially when viewing 3D models. The larger screen also allows the part drawing to be visible while programming. Using the touchscreen, in conjunction with the optional DXF converter, also eliminates the need for a mouse to navigate and edit programs. Operators now have a wealth of information and functionality at their fingertips, with help videos, digital speed and feed control and detailed tool library all available on-screen.

XYZ Machine Tools range of CNC vertical machining centres will be represented in the form of the Linear Rail (LR) series and Heavy-Duty box slideway machines (HD). These machines come with the Siemens 828D control, with Shopmill or Shopturn. Customers looking at the HD VMC version can also specify the Heidenhain TNC 620 control as a standard option.



XYZ UMC-series takes care of multi-axis machining with the UMC-4+1 and UMC-5X machines proving popular thanks to their impressive specifications and price point. On show at MACH 2020 will be the UMC-5X which provides simultaneous 5-axis vertical machining centre capability. Available with either Siemens or Heidenhain control, with Traori and kinematic functions to ensure greater accuracy. Both UMC machines feature a 600 mm rotary table with full 360 degree rotation and capacity to hold components up to 600 kg. A-axis capability is +/- 120 degrees with servo worm drive control allowing full rotation in under 2.5 seconds. On the UMC-5X, the x, y and z axes make use of linear scales, optional on the UMC-4+1, with both machines benefiting from high precision rotary encoders positioned on the pivot points of the A and C axes.

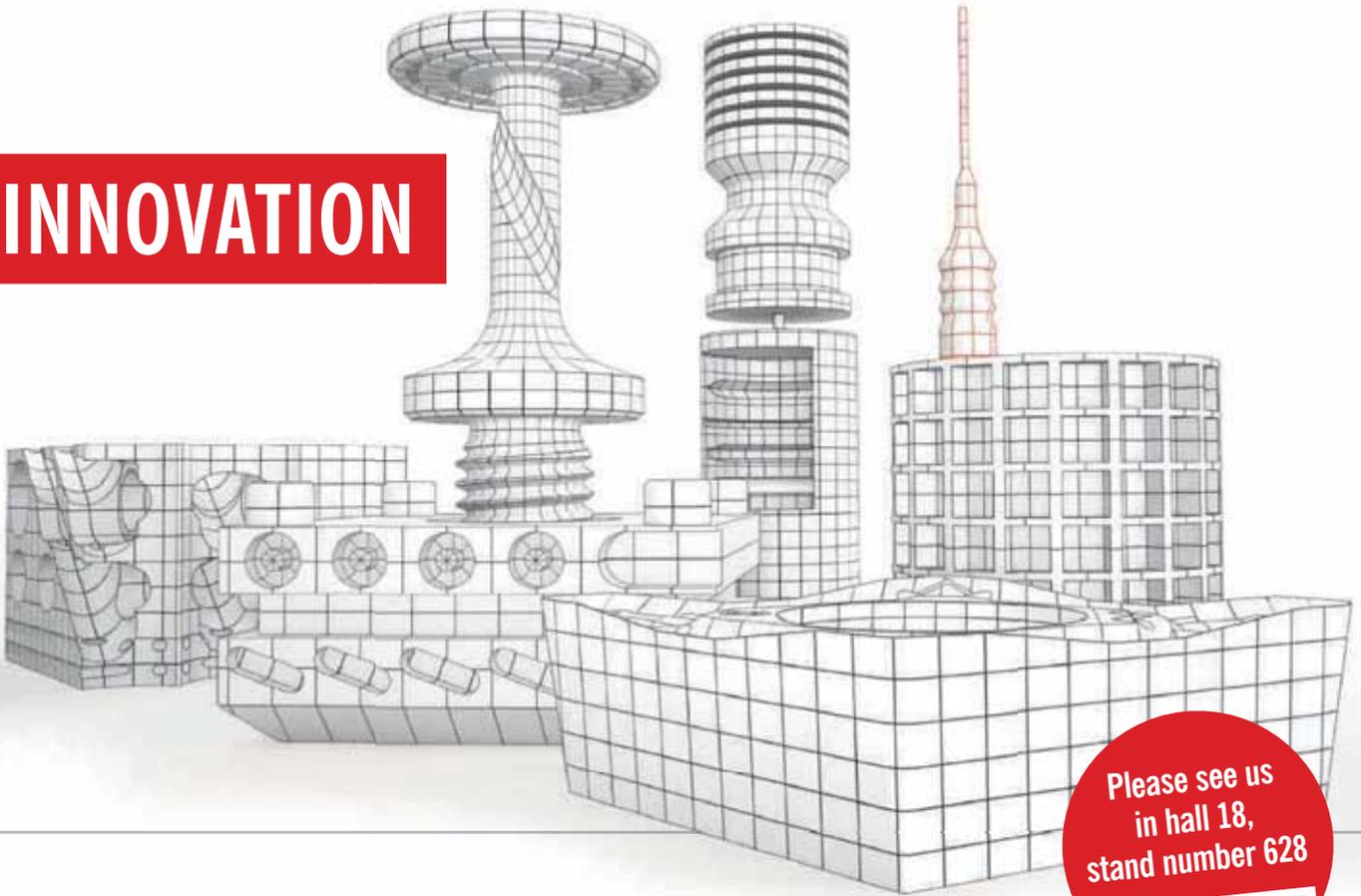
Automation also features strongly on the XYZ stand with the company's fully integrated robot machine tending system ROBO-TEND being show in action. This highly versatile system can be used with XYZ vertical machining and turning centres and provides a modular answer to the automation needs of small to medium sized machine shops, where versatility and flexibility are key requirements.

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Sodick's biggest ever stand at MACH

Sodick Europe, together with sole UK distributor Sodi-Tech EDM, is all set to "go large" at MACH this year, with its biggest-ever stand at the exhibition. Examples of the latest Sodick technology across a range of machining and production processes will be at the show, not only wire and sink EDM but also high-speed milling as well as horizontal injection moulding.

Seen for the first time anywhere will be a prototype of the new 5-axis K4HL small hole drilling machine, developed specifically to meet the requirements of the aerospace industry to drill thousands of high precision holes in exotic materials for jet engine turbines.

Sodick's new generation of high-speed machining centres incorporates linear drives in all axes. Unlike conventional machines, the UH650L combines both rough and fine milling in one operating mode, with a rapidly rotating and traversing tool of small diameter that cuts to fine depths, resulting in enhanced dimensional accuracy, surface finish, and tool life.



High-speed milling shortens cycle times and therefore the whole machining period. Other advantages are improved surface quality, multi-purpose tools and minimising chip sizes for ease of disposal. Furthermore, this technology does not require coolant and mist machining is also possible.

For customers looking to take wire EDM accuracy to a new level, the super-accurate ALC400P is the answer. Every element of the AL-P series has been developed to satisfy the most demanding requirements, for example a pitch accuracy of ± 1 micron.

ALC-P machines incorporate as standard an inverter-type dielectric chiller which monitors and maintains the dielectric temperature to within ± 1 degree, minimising the thermal effect inside the



work area. An additional thermal sensor is installed inside the work-tank for even more accurate temperature control. Even the door to the machine has been considered and is constructed of carbon fibre to minimise weight shift.

The VL600Q, part of Sodick's VL series range of advanced performance wire EDMs, builds on the technologies of the AL series. The large capacity VL600Q is well-suited for a wide range of machining applications and incorporates advanced tension servo control, precision pick-up function, an energy saving circuit and a dielectric cooling unit. Options include a rotary table, a large wire spool feeder and a PCD tool cutting package.



The AD35L demonstrates Sodick's dedication to innovation, using 3D design systems and the latest CAE technologies, numerous simulations have made it possible to create an improved basic machine structure with increased rigidity, to minimise deformation and enable optimum performance at high-speed and rapid acceleration linear motors. Furthermore, the design of an independent X- and Y-axis, plus an efficient machine layout, leads to a longer stroke, smaller footprint and highly accurate machining capability.

The AG60L really requires no introduction. As the bestselling model in Sodick's AG range it provides high speed, high accuracy cutting, incorporating linear drive technology and simplified control mechanisms, while providing a direct link between the drive and control and ensuring the fastest possible servo response and optimal spark gaps at all times.

Last, but by no means least, Sodick's new horizontal injection moulding machine is making its MACH debut. Although the machine has already been seen in Europe, it is expected to raise considerable interest at the NEC.

Sodick's GL30-LP moulding machine incorporates a two-stage plunger injection system, the V-LINE®, which is designed to provide three critical capabilities: a consistent plasticising heat profile, a constant filling volume and constant holding pressure. Together these capabilities ensure that the machine achieves ultra-precision injection moulding, consistently and reliably.



Sodi-Tech EDM Ltd is the exclusive distributor of Sodick EDM products in the UK. A wide range of Sodick wire-cut and sink EDM machines are on display at its large showroom in Coventry, West Midlands.

With an experienced team of regional sales engineers who can help you decide on the right value-for-money product available, backed up by a specialist team of application engineers, the company is on hand to demonstrate each machine's capabilities, ensuring that your final choice will suit the type and quality of components that you wish to manufacture.

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Ceratizit Group keeps the innovation coming at MACH

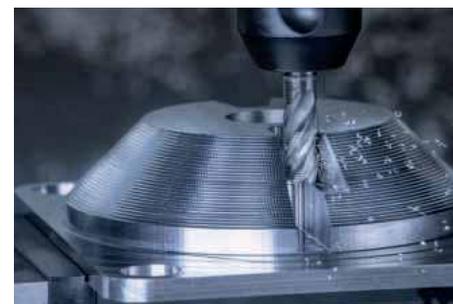
The four competence brands of the CERATIZIT Group, Cutting Solutions by CERATIZIT, Komet, Klenk and WNT, will be represented at MACH 2020 under the Team Cutting Tools banner, with the opportunity being taken to introduce a wide selection of new and innovative cutting tool developments that will further enhance productivity and reduce costs for customers.

The focus at MACH will be on improved productivity with major announcements, such as the completely new range of Silverline solid carbide milling cutters being unveiled at the show, as well as new turning grades and toolholding systems that will help drive down manufacturing costs. In addition, visitors to the Ceratizit stand will also see first-hand the revolution that is High Dynamic Turning with Ceratizit's FreeTurn tooling, which combine to flip turning techniques by maximising the capabilities of modern turning centre technology.

High Dynamic Turning and FreeTurn deliver an uncompromising solution to turning that allows traditional turning operations, such as roughing, finishing, contour turning, face turning and longitudinal turning, to be completed with just one tool. For over 100 years, turning techniques have changed little, if at all; yes there are always new chipbreakers and carbide grades, but methodology has remained the same.

Now, making use of the dynamics of modern turning centres Ceratizit has created a process that allows the approach of the tool to the workpiece to be varied by making use of a machine's B-axis. This gives the FreeTurn tool 360° degrees of freedom to produce the ideal approach angle to the workpiece, developing huge degrees of freedom thanks to the design of the FreeTurn tools. By rotating the cutting edge around its own axis, changes in approach angle can be achieved without interrupting the cutting process. This infinitely variable angle of approach enables flexible machining of almost every workpiece contour, as well as generating optimum chip breaking, higher feed rates and increased tool life.

WNT's SilverLine range of solid carbide milling cutters gets completely updated



with significant changes to the substrate, geometry and Dragonskin coating, but most significant is the development of the cutter core, which sees increased cutter rigidity, improved chip flow and process security. The change in cutter core results in increased cutting data, which in turn means greater requirement for swarf evacuation, particularly when roughing. The updated range now includes ripper cutters for the first time, the geometry of which creates smaller chips meaning performance can be maximised. Another benefit of the change in core design is that a wider range of flute options are possible, with cutters now available with either three, four, five, six and eight flutes. To meet the needs of the growing aerospace sector the range also benefits from an increased choice of corner radii.

Other changes see the shank choice increase with HA-style now available, making SilverLine cutters suitable for use in hydraulic and shrink fit chucks to allow elevated cutting data to be applied. The Dragonskin coating has been enhanced to deliver improved tool life by up to 50 percent.

The second innovation from the WNT brand is MultiLock, an exchangeable head milling system that combines a solid carbide head with a steel body to deliver cost and

productivity gains, especially in high-feed, long overhang applications commonly found in the die-sinking and aeroforms with focus on machining titanium alloys, tool steels and light alloys.

MultiLock delivers cost benefits as carbide cutting heads are manufactured using a precision sintering technique that creates a perfectly good cutting edge without the need for secondary grinding operations. Flute design also means increased chip flow and tool life with gains of over 400 percent and 550 percent respectively compared to a competitor product. The environmental impact of MultiLock is also reduced as the amount of carbide required is greatly reduced. By using a solid carbide head instead of indexable insert technology, WNT has maximised the cutting performance through increased cutting edges. With the positive locking mechanism and additional process security by use of clamping screw, MultiLock gives the performance of solid carbide, but at reduced cost.

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Technology that's 'light years' ahead

GF Machining Solutions, the EDM, 3- and 5-axis milling, Additive Manufacturing and Laser Texturing machine tool specialist, as well as automation and tooling system supplier, will be showcasing a range of its advanced technology solutions on its stand at MACH.

To do this, the company will be exhibiting six machines on the stand with a number of them making their MACH debuts at this year's event.

Two major themes running across GF Machining Solutions' stand and the technology being showcased are automation, utilising the company's WorkShopManager and CellManager technologies and rConnect, the company's Live Remote Assistance and Machine Monitoring platform.

In addition to the six 'physical' machines on the stand, GF Machining Solutions' product, technical and customer service staff will be available throughout the show to talk to visitors about the company's pedigree and prowess in delivering advanced manufacturing solutions to customers. These solutions include: micro-machining; laser ablation and texturing; dedicated 5-axis machining of turbine blades, impellers, blisks etc.

AgieCharmilles CUT P 550 Pro

GF Machining Solutions' CUT P series of advanced wire EDM machines provide precision component manufacturers and mould makers with improved accuracies and repeatability's, cutting speeds and process reliability.

At the heart of the CUT P 550 machine is a new, intelligent Intelligent Power Generator (IPG) that improves cutting performance,

from previous models, by an impressive 20 percent.

The machine also features a number of 'onboard' automation solutions that improve machine tool utilisation and uptime as well as reducing operational costs. These include the machine's new and innovative Automatic Slug Management (ASM) and Automatic Slug Welding (ASW) capabilities.

The CUT P 550 is equipped with sophisticated thermo-stabilisation technology that delivers accuracies down to 2 µm and surface finishes down to Ra 0.08 µm. Advanced taper cutting accuracy is provided via its EXPERT systems together with improved energy-saving ECONOWATT functionality.

The CUT P 550 will be showcased along with another innovative development from GF Machining Solutions in the area of consumables that specifically concerns SMART wire technology. This new technology features EDM wire embedded with radio frequency chips that help to minimise human error in identifying the correct wire while improving process quality and reliability, stock and process traceability as well as part cost calculation.

AgieCharmilles FORM P 350

From faster rib machining to micro-machining, the AgieCharmilles FORM family of Die-Sink EDM solutions is evidence of GF Machining Solutions' continued and significant investments to advance Die-Sink technology.

The result of this drive and commitment is the AgieCharmilles FORM series of machines that deliver unrivalled performance irrespective of the electrode material used or preferred.

Perfectly repeatable machining of micro-cavities is just one example of the manufacturing challenges that are resolved with the FORM P 350, and innovative, integrated technologies, such as iGAP, ensures the fast and accurate machining of rib cavities with a superior and homogenous surface finish.

Manufacturers requiring maximum productivity from their FORM P 350 machine can exploit the machine's eConnectivity and MTConnect features that enable them to stay informed of the machine's status.

The FORM P 350 machine at MACH 2020

will be integrated with a System 3R WorkPartner 1+ automation system to demonstrate to visitors how easily a die-sink machine's productivity and performance can be improved.

Mikron MILL P 500UD

The Mikron MILL P 500UD is an ultra high-performance, simultaneous, 5-axis machining centre that offers powerful and dynamic material removal capabilities, thermal stability and high stiffness, to deliver unrivalled precision and surface finish on complex parts.

The Mikron MILL P 500 UD features a thermo-stable and symmetrical design, so that even when machining at a fast pace and over long production periods, accuracy and process reliability remain high and consistent.

The machine delivers fast acceleration and is equipped with a powerful 36 kW Step-Tec motor spindle that enables the machine to get down to business fast. Direct angle measuring systems are mounted on the machine's rotary and tilting axes to guarantee high positional and repeatable accuracies.

The MILL P 500U provides manufacturers with exceptional competitiveness by integrating smart automation and ensuring process reliability.

Mikron MILL E 700U

The Mikron MILL E 700U 5-axis machine is a high-efficiency machining centre with a rigid C-frame construction, large-sized guideways and a double-supported rotary table that delivers high accuracies and surface finishes, improved process reliability and optimised chip removal rates.



The machine is equipped with up to a 36 kW/20,000 rpm spindle, 120 Nm, a direct rotary tilting table, -65/+120 degrees, a large ATC, up to 215 tools, 30 m/min rapids, a 450 kg maximum table load and an integrated work-piece pallet changer, up to seven pallets.

AgieCharmilles CUT AM 500

The CUT AM 500 is a horizontal, fast wire EDM. This fast, precise and automation ready machine is dedicated to metal additive manufacturing (AM), making it easy to separate additively manufactured metal parts from the build plate while maintaining geometrical accuracy and ensuring assembly readiness.

Accommodating parts up to 510 x 510 x 510 mm (including the base plate) and up to 500 kg in weight, the CUT AM 500 uses 0.2 mm diameter wire to separate additively manufactured parts from the build platform at a maximum cutting speed of 300 mm²/m. It delivers ±0.1 mm accuracy and surface roughness of less than 6 µm. This solution brings together horizontal wire orientation, an integrated basket to catch separated parts and a rotary axis to create a



robust process supporting the part, easy part handling and prevention of damage to the part.

DMP Flex 350 from 3D Systems

The DMP Flex 350 produces high-quality precision parts up to 275 x 275 x 380 mm made of high-performance metal alloys. The machine represents an integrated metal 3D printing solution that includes a production DMP printer, 3DXpert software and Lasform materials. The DMP Flex 350 delivers the purest atmosphere during printing: a consistently low oxygen

environment, fewer than 25 parts per million. This solution ensures excellent microstructures and very high density and stable mechanical properties.

High-productivity 3D metal printing is ensured by the machine's fast, bidirectional material deposition. At the same time, users' productivity is accelerated by high printer utilisation and short changeover time.

Martin Spencer, GF Machining Solutions UK's, managing director says: "We are showcasing a comprehensive cross-section of advanced technology solutions to visitors.

"Few, if any, machine tool company can offer the depth and breadth of different, yet often complementary, manufacturing technologies as GF Machining Solutions and the six machines being exhibited demonstrates that we are a company whose technologies are literally light years ahead."

GF Machining Solutions Ltd

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Metal cutting technology for a new decade

Hurco's location at MACH 2020 will be the same as two years ago, but will be even larger at nearly 300 sq m². The exhibition will mark the launch of two product ranges.

There will be an integrated robot loading solution from Hurco's new automation division, ProCobots. Four standard products of different sizes constitute the range, all equally well suited to feeding machining centres or lathes.

To be shown for the first time ever will be the company's new range of lathes with driven tooling, which will be represented by the TM8Mi model.

Focus on 5-axis machining

Hurco is increasingly seen as a major 5-axis machining centre supplier, with customers replacing 3- and 4-axis machines with these higher-end products. Some not only have extra CNC axes but also enhanced specification in terms of higher feed rates and spindle speed, plus linear scales rather than rotary encoders in X, Y and Z and torque motors rather than standard drives in the rotary B and C axes.

The company will be showing examples of all 5-axis machining centre configurations in its portfolio. The flagship VMX42SRTi, with torque motor-driven B-axis swivel head and C-axis rotary table, flush with the fixed horizontal table, offers the most flexible production possibilities within a relatively compact footprint.

The more traditional cantilever table design of the VC500i is ideal for one-offs

and more complex applications, while the VMX300i is a more economical solution incorporating a swivelling trunnion with 250 mm diameter rotary table.

The range will be completed by the addition of a Kitagawa TT150 table to a 3-axis Hurco VM20i. The combination gives full simultaneous 5-axis capability plus the option to remove the compound table for machining of larger components or multiple parts using the machine's three CNC axes.

Hurco will demonstrate the latest software developments for its WinMAX machining centre controls, including the 3D DXF and solid model import functions that allow 5-sided parts to be programmed conversationally, directly from a STEP or IGES file, by automatically inserting transform plane commands.

Plug and play automation

As automation solutions become more cost-competitive and easier to integrate, Hurco will be showing two different approaches. The ProCobot collaborative robot is designed as a plug and play solution that can be moved from machine to machine.

There will also be a Hurco 5-axis machining centre on the stand fed with pallets by a dedicated Erowa Robot Compact system, ideal for automated production of one-offs and low volumes.

Dual-column DCX machines

At the larger end of the Hurco size range, a 3-axis DCX22i twin-column, bridge-type machining centre will occupy a significant part of the stand. With 2,200 mm x 1,700 mm x 750 mm axis travels and six tonnes table load capacity, it suits machining of big components, particularly those requiring the maximum Y-axis travel. Although too large to show at this year's MACH exhibition, Hurco will be launching the Mark II upgrade of the huge, 5-axis DCX32-5Si model.

Machining centre from Roeders

The company has been the sales and service agent in the UK and Ireland for Roeders machining centres for more than 15 years. The German-built, high-speed, high



accuracy equipment will this year be represented on the stand by a RXP601DSH 5-axis model. An applications engineer from the factory in Soltau will be present throughout the show to demonstrate cutting strategies.

Growing turning centre range

The long-anticipated addition of a driven tool lathe to the popular Hurco XP range will come to fruition at MACH 2020. The new TM8Mi turning centre with axial tooling will be available to view for the first time.



Additionally, a TM10i XP with robot automation will show the capabilities of this 2-axis lathe range. The XP suffix denotes an upgraded version of the previous models, including larger spindle bore and roller guideways, plus control features such as concurrent programming and enhanced rigid tapping.

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Stand: 6-110



Kawasaki Robotics presents 'Ask the experts' facility at MACH

MACH 2020 exhibitor Kawasaki Robotics is pioneering an innovative new opportunity for visitors with a confidential advice service on its stand for the duration of the event, with visitors able to remain completely anonymous should they so choose.

For the first time, visitors who might be thinking of automating but are uncertain about whether it is necessary, viable, affordable or achievable can meet with a Kawasaki Robotics expert for an independent assessment. To ensure that any advice provided is indeed independent, show visitors need not provide their name or company name when they meet with the Kawasaki Robotics experts, just their job function.

Kawasaki Robotics' Ian Hensman, who together with fellow industry stalwart Malcolm Akers will be providing the service throughout every day of MACH 2020 says: "What matters here is independence and anonymity. If visitors seeking advice wish to remain anonymous, they need only remove their badge before joining us and discussing their ideas. This is not about us selling



robots: it is about providing experienced insight into the advantages and possible pitfalls in potential applications and offering overarching guidance and advice in such a way that potential users can better validate their ideas before investing too much time, money and resource into taking things further."

Kawasaki Robotics arrives at MACH 2020 fresh from a stunning win at the Plastics Industry Awards 2019, when it picked up 'Supplier Partnership – Ancillary Machinery Award' for its work with Malvern-based precision moulders SynthoTec Ltd.

SynthoTec operations director Wayne Williamson, on the many reasons why the company chose a Kawasaki robot, says: "We are extremely pleased that we chose Kawasaki Robotics for another reason too. We have been dealing with engineers who listen, understand what we're saying and what we want to achieve and are always available to us on demand when we have queries or questions."

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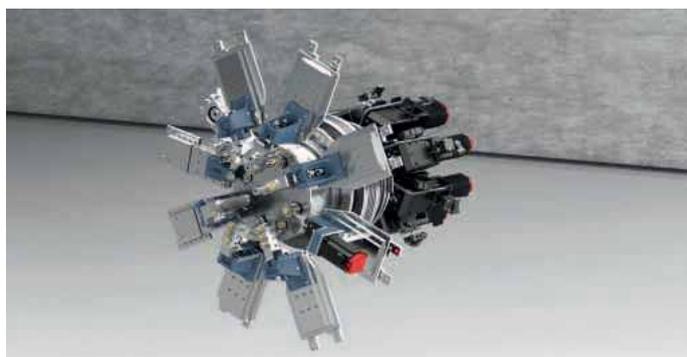
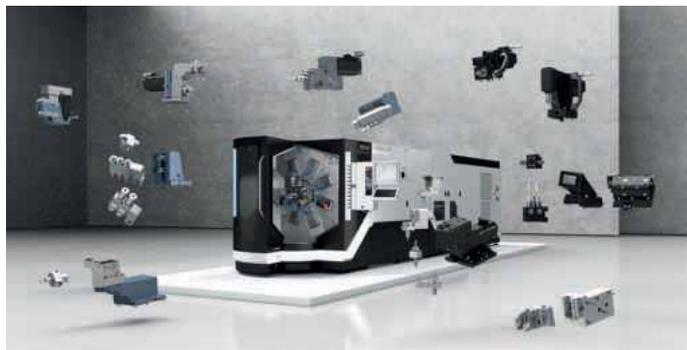
Tornos MultiSpindle to get UK debut at MACH exhibition

MACH 2020 is just around the corner and Tornos has a real treat for turned parts manufacturers, giving a UK exhibition debut to the MultiSwiss 8X26 and the SwissNano 7. If you're a turned parts manufacturer looking for something to give you a real competitive edge, you need to see the Tornos MultiSwiss 8X26 at MACH. This machine, one of a family of three ranging from 14 to 32 mm spindle sizes, will appear at the exhibition alongside the SwissNano 7 and the TISIS connectivity package that the company continually evolves as a seamless Industry 4.0 integration solution.

Equipped with eight spindles and eight slides for main operations and accommodating up to three tools per slide, the MultiSwiss 8X26 takes the performance of the MultiSwiss range to a new level, both in terms of component complexity and productivity. With eight highly dynamic synchronous motor-spindles and ultra-fast barrel indexing, the exciting MultiSwiss 8x26 can produce turned parts up to 26 mm diameter at staggering productivity levels.

The new MultiSwiss 8X26 incorporates powerful independently operating 11 kW motor-spindles that are equipped with a C-axis and counter spindle. Reaching speeds of 8,000 rpm in tenths of a second, these advanced motors make a major contribution to performance and productivity. As an option, the machine can be equipped with Y axes to further boost its capabilities. The machine is available in three configurations to meet the demands of the end user and this includes the entry level option of working without a Y-axis; the option with three Y-axes for intermediate applications and the complete machine with six Y-axes for the most complex parts. In each machining position, the operator can tailor the speed and machining conditions as required.

From an ergonomic perspective, MultiSwiss machines are as accessible as single-spindle machines and a single-spindle machine operator can quickly become a MultiSwiss operator. As quick to set up as a single-spindle turning machine, the key difference is that the MultiSwiss is at least five times as productive as a single-spindle turning machine. The machine boasts the largest working area on the market and its exceptional 'walk in' accessibility offers real savings when changing over jobs. This concept makes the MultiSwiss as simple to set up as a single spindle turning machine; the only difference ultimately lies in the number of spindle collets to change. Each spindle is equipped with a C-axis and the machine's



hydrostatic spindle bearing technology offers exceptional dampening performance when machining.

The MultiSwiss can improve surface finishes and extend tool life by an average of 30 percent and up to 70 percent in some extreme cases, minimising machine stoppages.

The new MultiSwiss also demonstrates seamless integration with all the necessary peripherals built into the machine design. As standard, the MultiSwiss includes the bar feeder, swarf, oil and dual filtration management system, all housed behind the machine in a compact and neat container.

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XYZ to demonstrate latest compact waterjet machine

The latest small-format WARDJet waterjet cutting machine will be demonstrated by XYZ Automation Group at MACH. Part of the A-Series of machines, the A-0612 shares the same industrial design features and performance capabilities of the larger-format series of machines but in a more compact size. It has been developed to accommodate the requirements of engineering shops and machining centres where workspace is at a premium and the need for more cost-effective production equipment are major considerations.

A key benefit of the A-0612 is that, while similarly configured waterjet machines invariably operate at pressures ranging from 30,000 to 45,000 psi, the A-0612 will operate at 60,000 psi. This enables machine owners to match the performance capabilities of much larger waterjet machines but at a commensurately lower cost.

In common with all of the larger-format machines, the A-0162 is based on a heavy-duty tank construction embodying formed quarter inch-thick steel for the side and floor and a five-inch box channel for

added strength, reinforced with a half-inch by six-inch steel reinforcement bar. It also incorporates multiple cutting tool heads, an industrial-grade rack and pinion drive system for optimum cutting precision and the elimination of problems frequently encountered with conventional belt-driven systems with an optional water level control system and cutting table enclosure. These combine to reduce splashback and thus conserve water as well as reducing machine noise and thereby further enhancing the environmental and workplace safety credentials of the A-0612.

The A-0612 will be shown cutting a wide range of materials for which the machine is ideal. These include stainless steel and other non-ferrous metals, cast and wrought iron, solid and composite rubber formulations, foamed substrates, high-pressure laminates, ceramics, glass and fibreglass. The machine is supported with proprietary MOVE motion control software and a comprehensive performance warranty.

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Fast and efficient automated blisk surface finishing comes to the UK

Since their inception for helicopter engine compressors in the 1980s, blisks (bladed disks or IRBs, integrally bladed rotor blades) have become an increasingly important feature of turbo-fan aerospace engines. Extreme heat, pressure and the erosive effects of fine particles drawn through the compressors at high speed are just some of the operational environmental conditions they need to withstand.

Blisks boost engine efficiency

Combining rotor disks and blades as a single part reduces components in the compressor removes a potential source of failure where blades would normally attach and also increases overall engine efficiency. This latter point is significant as reducing fuel consumption is a key driving factor for the aerospace industry as airlines continue to improve their environmental footprint while controlling costs.

Blisks are often produced by CNC engineering. However, this process is now complemented by the rapid development of additive manufacturing. 3D printing saves wasted material associated with CNC machining a blisk from a solid block of metal, usually titanium or a nickel-based alloy. Additive manufacturing also increases design flexibility and aids rapid prototyping. However, both CNC and AM manufactured blisks still require post processing to produce the final surface finish at the desired tolerances.



Long with smooth airflow surfaces, blisk performance greatly depends on a precise and uniform blade profile, especially along the leading and trailing edges

Challenges of surface finishing blisks

Surface finishing a whole blisk is more difficult than individual turbine blades. The first issue is the overall size and complexity of a full blisk compared with a single blade. The second critical factor is blade performance. Along with smooth airflow surfaces, performance greatly depends on a precise and uniform blade profile, especially along the leading and trailing edges. Any surface finishing must ensure this profile is retained or, as is more usual, taken to a level of perfection not achievable by the original manufacturing method or additional processing such as costly and variable finishing with hand operated power tools.

Machines for blisk finishing

For individual turbine blades, highly controllable stream finishing machines from OTEC Präzisionsfinish can smooth surfaces to required values of $Ra < 0.2 \mu m$ in minutes and even achieve $Ra < 0.1 \mu m$ in a little more time. During the process, a minimal amount of material is removed evenly from the surfaces, achieving effective smoothing and precise edge rounding, simultaneously, without altering the profile. With up to five blades mounted in a OTEC stream machine, the time to produce a target finish can be as

little as three minutes per blade and is reliably repeatable.

For whole blisks, Fintek is bringing to the UK The Intelligent Polishing Systems (Haug Intelligente Poliersysteme) INNO series. Like OTEC, IPS is another innovative surface finishing machine/process producer. Sharing the same German high value engineering ethos, the company is able to produce machines of bespoke design for specific applications and that includes full automation and industry 4.0 capabilities.

The INNO series from IPS is a vibratory isotropic super finishing process optimised for the surface finishing and polishing of whole blisks up to 950 mm in diameter. Fully compliant with existing aerospace approved isotropic processes, versions of INNO are available for manual operation or can come complete with Siemens PLC control for full automation and integration into large-scale manufacturing systems.

Handling a blisk is more problematic than a single blade, so IPS has developed a special pneumatic extendable mandrel to greatly speed loading and unloading the blisk from the process bowl. Once lowered in the bowl, the abrasive effect of the process media is controllable, driven by two vibratory motors. The flexible adjustment of



The standalone INNO series from IPS - a vibratory isotropic super finishing process optimised for the surface finishing and polishing of whole blisks up to 950 mm

the unbalanced motors allows for the granulate movement to be modified to act on all airflow surfaces of the turbine blades, while ensuring the all-important blade profiles are not compromised. The process is supported by the addition of high gloss compound or water.

Accommodating Industry 4.0 and bespoke manufacture

With extensive Industry 4.0 capabilities, the INNO series is perfect for new production lines or as a plug-in upgrade for ageing



Rooms with networked systems can be specified with conveyor feed and automated robot loading and unloading to further speed production

vibratory machines. Smart factory interface connections enable full automation and quality control through data acquisition and monitoring, including detailed track and trace information, this makes them ideal for inclusion in aerospace manufacturing cells of any size.

While a range of single and standard machine configurations are available, including an additional machine enclosure, IPS excel at working with customers to produce bespoke 'specials' engineered to accommodate unusual load specifications or automated production requirements. Rooms with networked systems can be specified with conveyor systems and automated robot loading and unloading to further speed production. Vibratory systems are relatively noisy, so control rooms can be sound dampened to create a more pleasant working environment.

To find out more about OTEC stream finishing machines for turbine blades or IPS INNO for blisk finishing, visit Fintek at MACH 2020. Fintek also offers extensive subcontracting surface finishing services.



The SF4 stream finishing machine from OTEC is capable of smoothing individual turbine blade surfaces to values of Ra < 0.2 µm in minutes

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MACH Stand: 19-26

New tool for Inconel 718 bearing removal announced

Oxford-based aerospace bearing and tool expert Carter Manufacturing has released its new UNASIS Aerospace bearing cutting tool. The new tool is specially coated, using physical vapour deposition, with an exotic material that is significantly harder than tungsten carbide. The company states that it is the only commercially available aerospace bearing cutting tool designed for the challenges present in removing Inconel 718 bearings.

FAA/EASA 145 engine and component repair stations, OEMs, airlines and the military working with Inconel 718 bearings all know the limitations of currently available bearing removal tooling and of the expense involved in frequently replacing cutting tools when these style bearings need to be



removed or installed. As Inconel 718 is a nickel-based precipitation-hardening alloy, only particular tools will be effective.

Now, with the advent of Carter's new UNASIS tool, originally designed for use both in and around the CFM56-B and V2500 engines but equally at home on other fitments, engineers have a bearing removal and installation tool that can readily cope with extensive use on Inconel 718 bearings on almost all aircraft both fixed wing and rotary.

The new UNASIS Aerospace bearing cutting tool is part of a complete kit: a useful package that includes a tri-roller swaging tool, a specialist cutting tool, an installation and removal tool, a proof load test tool and breakaway torque tool. This ensures the entire job can be simply accomplished with custom engineered and kitted tooling.

Equally good news from Carter is that the new UNASIS tools can be specified for use with either a drill press or completely portable and hand-held, thus offering users significant operational flexibility.

The new tool allows users to cut a relief onto the V-groove in Inconel 718 bearings



so that the bearing can be pressed out without damage to the housing and, in the event of technical challenges arising, Carter provides a first-class response to UNASIS customers in need of application assistance or advice.

Erick Sloan, UNASIS lead engineer for the Americas says: "This unique new tool has been in the pipeline for some time as we developed and refined the materials technology necessary to work with bearings manufactured from Inconel 718."

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Orizon works with Starrag to achieve new horizons in world-class aerostructure machining

Today, more than half a century after singer Gene Pitney put America's southern central state of Oklahoma on the world map with his hit song '24 hours from Tulsa', another phenomenon is bringing global recognition to the area: Orizon Aerostructures.

Orizon Aerostructures is a manufacturing and technology company that is building something unique in the Midwest with six locations and 763 employees dedicated to aerospace manufacturing and complex sub-assemblies. It has almost 780,000 ft² of production area at sites in Kansas and Missouri as well as Oklahoma, including four machining locations which between them utilise 100 CNC machines, 50 of which are 5-axis or more.

But it is the company's newest plant in Grove, a little under a 90-minute drive from Tulsa, where a new tune in manufacturing excellence is being played.

In a purpose-built factory that is part of a total investment of \$50 million plus in ten Ecospeed F2060 machines, Orizon has installed a Flexible Manufacturing System (FMS) based around nine Starrag 5-axis Ecospeed machining centres. It is setting new standards in the machining, predominantly milling, of aerostructures.

The FMS, the largest integrated system of its type in the western hemisphere, is enabling the company to achieve at least a 30 percent reduction in machining times across all the parts, compared to former



methods. It has also seen a massive improvement in surface finish with much less deburring and polishing requirements as well as an amazing revenue to capex ratio and 2-3 x revenue per person over traditional methods of machining.

Incorporating the nine high-speed, 50 m/min traverse rates, Ecospeeds that are fed by an automated rail-guided, 18-station pallet system and completed by an integrated washing/drying cell, the FMS is manned by just five people on each of the two daily shifts for 24/7 operation. This enables Orizon to achieve extraordinary

machining benefits on the range of aerostructures, primarily wing spars, skins and bulk heads, for the original equipment manufacturers in aerospace and defence.

Orizon's forward-thinking machining philosophy is certainly paying dividends and the company's attitude towards its investment is clear.

It was not, however, a case of Orizon simply placing an order for the initial six machines for the FMS with the plan to add another three machines and perhaps more in the future. Orizon first installed a stand-alone Ecospeed with the Z3 head to thoroughly test the machine's effectiveness and efficiency on production parts to achieve what Josh Fink, vice president of machining, says: "will provide customers with faster, better and more affordable production."

Orizon's original Ecospeed F2060 sits alone in its own area, enabling the 86,000 ft² factory floor to host the FMS which began development as a six-machine FMS. The first F2060 for the FMS was installed in January 2017, followed two months later by the pallet system and the system was in production by October 2017. A year later, three additional Ecospeeds were added and "these latter three machines



did not add any labour overhead to the system, just revenue," adds Josh Fink.

Starrag's Ecospeed F2060 has travels in X, Y and Z of 6,300 mm by 2,500 mm by 670 mm, spindle in horizontal position and traverse rates of 50 m/min in each axis. In addition, the ± 45 degree A/B axis is complemented by a 30,000 revs/min, 120 kW spindle that offers a torque of 83 Nm and can run non-stop at 30,000 revs/min in S1 mode. The specification is additionally enhanced on a machine with high dynamics in acceleration of up to 1G in all five axes and jerk up to 200 m/s³.

The load/unload station sees the parts, up to 12 different parts per pallet, though workpiece size, especially heights, are ideally standardised on each 2 m by 6 m pallet, each one capable of accommodating loads of 5,000 kgs loaded manually and clamped by a mixture of vacuum and mechanical clamps, with the pallet in the horizontal position. Once loaded, the pallet is tilted 90 degrees and is moved into the 270-foot long FMS, with the sophisticated cell controller 'deciding' which machine will process which pallet.

With common tooling held by each of the Ecospeed's 129-station toolchangers, this

means that any F2060 can machine any part in any order, the cell control system provides the ultimate in flexible manufacturing. Orizon worked closely with Starrag to standardise the tooling and machining speeds and feeds, as well as programming routines, to enable this high-level flexibility of production.

After machining, the pallet moves to the wash/dry station where high-pressure wash nozzles direct angled jets to reach every corner of a part before an air blast is used for drying. That said, by using Minimum Quantity Lubrication (MQL) workpieces enter the wash station bearing a relatively low amount of swarf/cutting fluid. Upon unloading, the pallet returns to the horizontal and each part is removed from the system for deburring then onto a Coordinate Measuring Machine (CMM) for 100 percent inspection.

Each of Orizon's Ecospeeds features a Sprint Z3 parallel kinematic machining head, which boosts the machine's ability for highly dynamic, simultaneous 5-axis/5-sided milling and drilling. The head uses three parallel linear axes drives mounted radially equi-spaced in the headstock. The spindle platform is connected to each drive via rigid

levers with pivots at each end and a ball joint at the other.

When all three axes move simultaneously, the spindle is moved in a straight line in Z, synchronised motion of the three Z-axes allows the spindle to follow any path within a spherical cone of ± 45 degrees at a maximum of 80 degrees/sec. If the three axes move differentially, the spindle platform will be tilted in the A/B kinematic.

Each machine has an integral C axis to allow the use of automatic interchangeable angular milling heads which operate at every spatial angle between -135 degrees to +135 degrees. These heads effectively make each machine a 6-axis unit, for accessing and machining otherwise difficult-to-reach areas.

Standard HSK A63/80 taper tooling is used, as well as 'mono' tools up to 50 mm diameter. All tools feature RFID chips for effective tool management.

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MACH Stand: 20-563

WDS meets the standards of the UK aerospace industry

The aerospace industry is renowned for its focus on excellence. As such, its suppliers must meet exacting quality standards and strict cost targets, while also ensuring adherence to strict delivery schedules. Darren Gilligan, an aerospace product specialist at engineering component manufacturer and supplier WDS Component Parts Ltd. looks at some of the special requirements of the industry:

The aerospace industry is instrumental to the UK's economy and its global reputation as a leader in engineering. It has an annual turnover of over £30bn, employs about 120,000 in 600-800 companies and generates about one percent of the country's total economic activity.

The aerospace sector is very collaborative in the way it operates. The big companies at the heart of the industry generally do not aim to do everything in house but work closely with suppliers. For instance, by tapping into their design expertise. This means, among other things, that more people are involved so projects can advance

more quickly, while expertise is nurtured over all companies involved.

WDS supplies the aerospace industry through a number of channels. On the aircraft manufacturing side, it tends to have a focus on material handling operations. It supplies hoist rings, T-bolts, spring bolts, quick release pins, handwheels, clamps, and other standard parts for incorporation into the fixtures used on the plant and machinery on the production floor.

While great use is made of standard parts, WDS also often lends its expertise by designing customised holding rigs, tombstones and other equipment for particular duties.

Component quality is a key concern because the parts being made tend to be of extremely high value, so manufacturers want to minimise the risk of them being dropped, scratched or damaged in other ways. Therefore, many of the parts are of high strength designs or made in stainless steel or engineering polymer.

Market forces are driving many



manufacturers to look at automating their processes to increase productivity. To this end, there is an industry wide trend for improving workflow and materials handling and for ways to improve the actual manufacturing procedures. WDS is able to help with this by capitalising on its many years' of experience developing solutions in aerospace and other sectors.

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MACH Stand: 6-856

Pump manufacturer installs first sliding-head lathe

Two-year payback expected by bringing subcontracted work in-house

One of the UK's largest pump manufacturers shipping more than 200,000 units per year, Charles Austen Pumps, has invested in its first sliding-headstock bar auto, a Cincom L20-X from Citizen Machinery UK. It was installed in the OEM's Byfleet factory in June 2019 and has taken over the turn-milling of parts up to 25 mm diameter, the vast majority of which are brass. A few aluminium, stainless steel and plastic components are also produced.

Established nearly 75 years ago by Charles Austen, the company is credited with inventing the diaphragm pump, which in the 1950s helped John Enders develop the polio vaccine. The firm's products later assisted the development of Concorde and the Apollo 15 mission to put a rover on the moon. A wide range of pump types is now manufactured and the firm has been so successful that growth over the last six years has been an amazing 30 percent per annum, driven by strong home sales and a buoyant export market.

Naturally that has put a strain on all areas of the operation, not least the machine shop. While prismatic metalcutting including the milling and drilling of parts for pumps, as well as injection mould manufacture, is largely carried out in-house, the two fixed-head, 57 mm bar capacity CNC lathes on site struggled to cope with



the production volumes of rotational parts. The result was that lately as much as two-thirds of the turning requirement was subcontracted out at a cost of more than £100,000 per year.

Machine shop manager at the Byfleet facility, Matt Wright says: "More than 80 percent of our turned components are

between 16 and 19 mm in diameter, so we needed a lathe of relatively small bar capacity to start bringing work back to our factory. Our bigger lathes are not so efficient when machining these smaller workpieces due to their longer tool movements and slower axis travels.

"We considered fixed-head as well as sliding-head technology, as our parts are generally short compared with their diameter. We concluded that sliding-head turn-milling would be more productive because the tools are mounted on gang posts rather than turrets, so are quicker into the cuts as they have less distance to move. Also, as we do not need to use the guide bush the bar remnants are shorter, saving money on material.

"Should we ever need it, we also have the flexibility of quickly installing the guide bush for true Swiss-type turning of shaft-type workpieces over 2.5D."

He advised that they initially reviewed most of the sliding-head lathe providers and said that their choice of Citizen was primarily down its reputation for quality machines and for providing good applications support, training and after-sales service, which since the L20-X was installed he describes as "brilliant".



A selection of turn-milled components for the OEM's pumps was taken to the machine supplier's Bushey technical centre, where their engineers recommended the best machine for producing the parts. This was deemed to be the twin spindle L20-X turning centre in optional, oversize configuration capable of machining bar up to 25 mm in diameter. An lemca barfeed for three-metre stock was also supplied as well as a workpiece conveyor.

Standard features of the machine include up to 44 cutters including rotary stations on the gang, opposing and back tool posts, with Y-axis movement of the first two tool carriers. The LFV version of the machine with its patented, 2-axis CNC chipbreaking software in the control's operating system was not needed, as free-cutting brass is mainly machined at Byfleet.

Batch sizes produced on the Cincom vary greatly from ones and twos for the R&D department up to 10,000-off. The first job on the machine was a brass cam that ran continuously for 96 hours, from Monday morning to Thursday evening. Machined in one 105-second cycle to tolerances down to + 10 / -5 microns, including in-cycle

engraving for traceability, the part previously needed two operations taking three times longer, plus additional handling for manual chamfering and stamping. Matt Wright advised that machine attendance was minimal during the day and non-existent overnight. When he arrived at the factory the next morning and measured the parts, all were not only within the 15 microns tolerance band but right in the middle of it.

Another brass component, this time a 19 mm diameter disc-type part just 0.6 mm thick, saw its two operations in 2.5 minutes reduced to one 50-second cycle - another three-fold saving - plus elimination of handling. A third example, a double eccentric with an offset hole and an offset spigot with a five micron limit, is now produced in under three minutes instead of five, including engraving which previously had to be done manually. Surface finish on all parts coming off the L20-X is noticeably better, according to Matt Wright.

An element of the service provided by Citizen Machinery prior to delivery of the lathe was the provision of programs for machining two components. Since then, the

Cincom machine operators including Matt's son Ryan have been using the supplier's Alkart CNC Wizard programming software. It is easy to learn and a simple process to cut, modify and paste elements from the original programs and add new blocks for other features using the wizard's G-code and M-code library built into the software.

Matt Wright concludes: "We are already bringing turned parts manufacture back in-house and that will accelerate in the coming months. We have hundreds of component variations lined up to put on the L20-X. By Easter 2020, we should be turn-milling them all in our factory.

"With the amount we have been spending lately on subcontracting services, I calculate that the Citizen Cincom slider will pay for itself in a little less than two years."

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Foundry to double production output of machined transmission castings

A substantial proportion of MJ Allen Group's more than £30 million annual turnover comes from gravity die casting and machining the aluminium main case, intermediate and cover for a modified transmission that goes into the all-wheel-drive (AWD) version of the Ford Transit van. Currently 100 sets per week are delivered to Getrag Ford Transmissions in Halewood for assembly and export to a vehicle manufacturing plant in Turkey, but that number is predicted to double by the spring of 2020.

To cope with the extra demand, the subcontract casting and machining specialist is building a second die casting cell in Ashford, Kent, which is due to be operational in early 2020. Additionally, in September 2019 the company bought a second pair of Heller horizontal-spindle, twin-pallet production centres to machine the increasing quantity of components.

Back in 2007 when Ford approved the AWD transmission design, the rights for which passed to MJ Allen when it purchased four-wheel-drive specialist County in Knighton, Powys, only around 30 transmission sets per week were cast and machined. The number has gradually increased but will grow significantly faster over the next few years, as more vans are being purchased to deliver goods including those ordered over the internet. Such vehicles are also popular with sole traders and as mobile workshops. In some countries, they are used for postal delivery or converted into ambulances.

Even at the start, 30 transmissions weekly involved much larger batches than MJ Allen

traditionally manufactured. Ones and twos up to a maximum of 10 were more usual quantities for subcontract sand casting and machining of the company's aluminium, iron and bronze components.

Existing horizontal and vertical spindle prismatic metalcutting equipment on the shop floor with working envelopes of up to 3 x 2 x 2 m were ideal for milling and drilling these castings, which can weigh three tonnes, but were overly large, not sufficiently well specified and too slow for production machining of the smaller automotive transmission parts.

Group managing director Tim Allen explains: "Early in 2006 we realised that new equipment would be needed for the Ford AWD project, so we visited the MACH exhibition in Birmingham to review what was available. Of all the potential suppliers we spoke with, Heller Machine Tools stood out as being the most receptive to our requirements.

"We wanted a two-machine turnkey solution and a hand-holding approach with applications back-up, as this was the first significant automotive contract we had won and our initial entry into machining of production volumes. That level of service was forthcoming from their Redditch headquarters and factory and continues to this day."

He added that the first models were Heller MCI16s with an 800 x 630 x 630 mm machining envelope, whereas the two latest models, H4000s, have a larger 800 mm cube working volume and are manufactured in Redditch, a fact that guarantees after-sales support of the highest level.



Installed in a space in MJ Allen's 18,000 sq ft machine shop previously occupied by test equipment that was relocated to a new, 2,000 sq ft extension, the H4000s mirror the duties of the MCI16s. One of each pair is devoted to producing the transmission's main case in three operations, the longest cycle being one hour. The other two are able to machine both the intermediate and cover castings four at a time per pallet in two operations apiece, as the cycle times are shorter.

Dedicated hydraulic fixtures, which are freely interchangeable between all four machines, secure the workpieces. Similarly, all programs run in any of the Siemens 840D controls. Accuracies down to ± 10 microns are achieved, which is the drawing tolerance for gear centres.

The Ford AWD contract is long-term, but with electromobility transforming the automotive world there will undoubtedly be changes coming. With this in mind, when opting for the Heller H4000s Tim Allen chose a larger working area than is actually needed for the transmission application and a B-axis rotary table, which is not currently used, thus providing flexibility for future changes of use.

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MACH Stand: 6-172



New turn-mill centres for more powerful machining

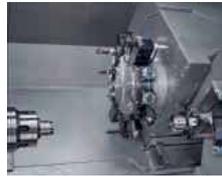
The common platform launched in 2018 for the manufacture of two universal turning machines, the B400 from Index and the TNA400 from its subsidiary Traub, has been expanded with the addition of the B500 and TNA500 with larger, more powerful spindles. The machines are available in the UK, Ireland and Middle East through sole sales and service agent Kingsbury.

The four machines have much in common, as the mineral cast bed, slideways and covers are identical. One difference is the control, the Index B400 and B500 being fitted with a Siemens Sinumerik 840D sl and the TNA400 and TNA500 with Traub's Mitsubishi-based TX8i-s V8 control. Another

distinction is that the main and counter spindles on the new 500 series lathes are A11/A8, one size up from the A8/A6 spindle on the 400 series and delivering 40 percent more power and torque.

To support long workpieces, TNA lathes offer the possibility of using a tailstock mounted on generously dimensioned roller guideways. As an option, the machines are available instead with a counter spindle for complete machining of parts on the reverse end after part-off and synchronous pick-up.

In the counter spindle versions, all machines are equipped with an Index radial turret. New is the option of selecting VDI40 holders instead of VDI30, enabling a slightly larger turning diameter and providing the live tools with higher torque. The twelve tool stations are equipped with the patented W-serration whose profile ensures that the holders can be aligned quickly and accurately.



Alternatively, a turret with axially driven VDI40 tools can be specified on the TNA 400/500, which is advantageous when using large, solid drills or boring bars as the forces are transmitted directly into the turret.

Options are available for economical machining of larger batch sizes, such as a package for adding a barfeed consisting of a hollow clamping cylinder, a remnant removal unit and a workpiece handling system with conveyor.

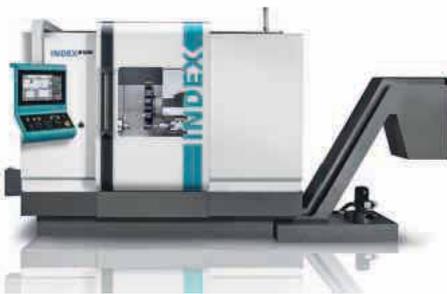
From 2020, all four machines will be prepared for use with the iXcenter robot cell equipped with an iXpanel whose operating system is Industry 4.0 ready. The system includes a space-saving, vertical storage unit for up to 22 pallets to facilitate automated production. A robot loads the pallet store with raw material and can remove pallets with finished components at any time without interrupting machine operation.

Kingsbury

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Nakamura purchase seals record year of investment for Scot Bennett

Installation of new CNC technology has capped over £350,000 of investment and record sales for a family-owned Northamptonshire manufacturer.

Scot Bennett Engineering, which supplies milled and turned parts to the automotive, agricultural, lighting and industrial sectors, has purchased its second Nakamura AS200LMYS from the Engineering Technology Group (ETG) to help it cope with a 16 percent increase in demand.

The single turret, 15 station live tool and twin spindle machine will reduce cycle times by up to 25 percent, as well as removing secondary operations on more than 40 different product lines.

It gives the company extra capacity with its milling work, capacity that will soon be used with a number of projects, including aftermarket motorcycle absorbers for an export customer growing in volume.

"The Nakamura is a high-quality machine and delivers the precision performance, speed and flexibility that we need," explains Rob Bennett, who took over the business from his father in 2010. "We already have an

AS200 on the shop floor and know, first-hand, what it can give you. This second machine will give us extra milling capacity and we have made sure that we have configured it exactly the same and chosen the same workholding and software."

He continues: "By doing this, we have removed the need for any extra training, whilst also speeding up the install process. ETG is a long-standing supplier and the service we received was second to none, as always."

Jon Mannion, regional sales manager at ETG, adds: "Nakamura is a very popular choice for subcontract machinists and it's not difficult to see why.

"The ability to mill and turn on the same machine, with live tooling delivering a 6k rpm spindle, is a real gamechanger for firms who want speed and the ability to manufacture complex components.

"It's great to supply Scot Bennett with this technology, just three years on from its first purchase with us. We've put our industry-leading maintenance, service and repair package in place on this machine to ensure



minimal downtime for a customer that is growing fast."

ETG delivers highly productive turnkey solutions to customers involved in automotive, aerospace, domestic goods, high value engineering, medical and oil and gas.

Its portfolio of world class brand includes Bavus, Hardinge Bridgeport, Chiron, Nakamura, Quaser and STAMA.

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Tibo used machines – a viable alternative to new machines

One very important part of the global business with deep drilling machines is the area of used machines. Tibo Tiefbohrtechnik GmbH, one of the leading manufacturers of gun drilling and BTA deep drilling machines from Germany, also discovered this business opportunity as one possibility to increase sales and gain new customers.

Due to the large number of Tibo machines in the market, customers quite frequently ask whether there is a way to trade in a used Tibo machine. Very often the customer either faces the decision to make an investment in new equipment, in these cases, older machines are often no longer required, or the decision has been made to give up deep hole drilling as a machining process for the future. In this case too, the deep drilling machine is no longer required and is then available as a used machine.

Due to many years of experience in retrofitting deep hole machines, Tibo happily picked up these customer requests and is now offering customers to trade in their used Tibo machines.

It does not matter whether the customer is investing in a new machine and would like to trade in his used machine or if he is giving up deep hole drilling due to lack of customer orders. Tibo is offering the



complete service to the customer for used machines as being done for new ones: disassembling at the customer site, packing and shipping of the machine back to the plant.

At Tibo's headquarters located in Pfullingen, Germany, the machine will be completely disassembled and cleaned. All wear parts are being replaced. Every other part is being inspected and if necessary being repaired or replaced as well. With

Tibo's modular concept, the machine can be brought back in a like new condition within a very short time.

For Tibo as a company there is quite a big market for used machines due to some very important advantages:

Short lead times - used machines can be delivered on a very short term to quickly add additional capacity for customer.

Very attractive pricing - some customers cannot or do not want to invest in a new



machine. These customers would rather buy a used Tibo machine instead of ordering a new one from a low-cost provider.

Machines for rent - on an individual case basis, overhauled machines can be shipped on short notice as an interim solution for production until a newly ordered machine is being delivered or for additional capacity needed for a limited time frame.

High process security - Tibo used machines come without a compromise in

terms of quality and reliability including a 6-month warranty.

An always updated list of available used and in-stock-machines can be found on Tibo's website: https://tibo.com/en/service/Short-term_available_machines

Made in Germany and used throughout the world

TIBO Tiefbohrtechnik GmbH is a company with operations throughout the world,



specialising in the design and production of modular deep hole drilling machines. Founded in 1994 and with its headquarters in the town of Pfullingen in Baden-Wuerttemberg to the south of Stuttgart, today it is one of the leading suppliers of single-spindle and multi-spindle gun drilling and BTA deep hole drilling machines for a broad range of applications.

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Multitasking machining centres double throughput and cut costs

Concours Mold Inc, based in Ontario, Canada, makes it a priority to keep its machinery and equipment up to date to ensure competitiveness. From its enterprise resource planning, ERP, system and advanced scheduling system, to its radio frequency identification, RFID, tool management system, to rigorous quality-check procedures, together with 5-axis machining centres, the company strives to continually improve its processes. In fact, it recently invested millions of dollars in new equipment, but one machine, the UNISIG USC-M, has so improved Concours' machining processes that, according to Ed Ergun, corporate sales manager, it has been a game changer.

Concours specialises in building small to very large injection, compression and hydroforming moulds as a primarily Tier-1 supplier to the automotive industry and has additional locations in Cullman, Alabama, and Puebla, Mexico; all locations run 24/7. Moulds built for interior automotive parts produce instrument panels, door assemblies, A, B, C and D pillars/assemblies and much more, while moulds for exterior parts produce such items as fasciae, grilles, spoilers and rockers. The balance of the company's business encompasses building moulds for heavy-truck parts and consumer products.

Still, it is the automotive OEMs that dominate Concours' customer list and, as anyone who has experience with serving the automotive industry knows, high quality is expected and mould deliveries are tight.

Ed Ergun states: "As our company announcement said when we launched our third UNISIG USC-M in February 2018, the USC-M series brings unmatched capabilities in a single, game-changing machine."

Before purchasing its third UNISIG in February 2018, Concours utilised these machines every day, repeatedly, during the mould building process. Anything that came into our facility basically hit these machines at one time or another." He adds that each machine would need to be reserved in the schedule, as needed, to complete that portion of the build, to keep blocks and components moving and on schedule. If any issues arose that prevented movement of

the workpiece, then the scheduling would be off and machining delayed till the next available slot opened up. It was a constant struggle to update and revise the schedule to remain current.

Ed Ergun continues: "Now, instead of reserving a boring mill for three days and then the gundrill for another three days, we can take care of all the boring and high-speed gundrilling on the UNISIG. The USC-M Series machine is very much a multitasker and has reduced our lead times by roughly 30 percent."

Concours regards the time spent setting up jobs as throw-away costs: "There are so many setups involved on just a boring mill alone, it adds up to costs that we have to absorb, plus a crane and any employees required to work on it," says Ed Ergun. For example, to set up a block in the boring mill, he says it would take half an hour to an hour, depending on the setup, to bore/drill five holes, then lay it down and set it up to complete another series of holes and so on.

Ed Ergun explains: "Now we have the 5-axis positioning capability of the Unisigs and FCS clamping systems along with automatic pallet changers on each machine, which is a 100 percent time-saver when it comes to switching a tool from one setup to the next," Concours now sets up one pallet while the other is being worked on. When setups are required on the original block, the pallets are shuttled so machining can begin on the other job while the first block is being set up. "Because of these new improvements, the Unisigs stay in production mode with minimal down time. I can honestly say that our setup time has decreased by more than 50 percent."

He states that as Concours purchased its first, second and eventually its third UNISIG USC-M Series multitasking machining centre, the company was able to eliminate other machinery and significantly reduce outsourcing work: "When we bought the



first UNISIG USC-M50, we were able to eliminate two boring mills right off the bat." The USC-M50 features a 120-position toolchanger. In addition, it has a 25-ton capacity table for workpieces as large as 3,000 mm, 50 mm diameter capacity for both BTA drilling and gun drilling, up to a depth of 1,830 mm and dedicated 5,000 rpm, 24/30 kW drilling spindle power.

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AMF zero-point clamping systems shorten setup times and increase flexibility

When one of the technology and world market leaders in providing equipment for tube, wire and bar rolling mills optimises its manufacturing process, some amazing things can happen. The traditional company KOCKS is investing in a new processing centre for manufacturing components on AMF zero-point clamping systems. This will make it possible to reduce production times by more than 80 percent. Additional benefits will be the flexibility gained in replacement parts production and the option of introducing a third shift requiring no manpower.

"We have been able to improve our manufacturing flexibility enormously with the AMF zero-point clamping modules," emphasises Carsten Aeilts, general manager at KOCKS Manufacturing GmbH & Co. KG in Bremen.

"Using a new manufacturing centre combined with the AMF system has allowed us to reduce the production times when manufacturing frame components to just under one fifth. This is largely due to the AMF zero-point clamping modules," confirms Kai Staschen, cutting team leader at KOCKS. "Some parts no longer need to be clamped nine times, as was previously the case, but only three times now and we can do that much faster now too." The tooling time saved not only completely benefits productivity on the new Mazak processing centre, but also on other machines.

Three adjustable rollers secure technological advantage

The KOCKS frames which have three adjustable rollers make up the core of the rolling mills. The 3-Roll technology developed by KOCKS to produce wire, rod, and bar steel, as well as tubes enables twist-free rolling of quality steels, special grades, super alloys, sintered materials, as well as non-ferrous metals and their alloys. All the company's experience and know-how is put into the frames. Their reliability and durability are crucial for manufacturing productivity and the quality of end products. For example, the rollers are used to roll round material with a 160 mm diameter and reduce it to 40 mm. KOCKS



The extra-strong K40-H AMF modules with a diameter of 148 mm realise 40 kN pull-in / locking forces as well as 105 kN holding force



On the huge Union drilling rig for heavy-duty cutting, the extra-strong K40-H AMF modules are used for direct clamping of the workpiece



The AMF zero-point clamping modules are largely responsible for drastically shortening production times

also builds 3-roll stretch reduction mills to manufacture seamless and welded tubes. Here as well, the frames play a decisive role.

The new Maztek Integrex machining centre has a machine table on which large diameter workpieces can be turned. Because the AMF K-20 module is also approved for milling/turning processing up to 2,200 rpm, the zero-point clamping module has also become the preferred solution here. It consists of a 48 mm tall base plate with four AMF K20 zero-point installation clamping modules. These realise pull-in and locking forces of 20 kN each and holding forces of 55 kN each. The repetition accuracy when clamping is smaller than

0.005 mm. With a 112 mm diameter each and additional, milled support pieces on the station, this creates a large contact surface. Despite this, the modules with an installation depth of 34 mm are extremely compact and only take up very little of the total installation height on the machine table. "For this reason, the base plate can also be kept relatively flat", explains Michael Gödecke, sales engineer for clamping technology at AMF.

A green light for greater safety

Cams, shafts, covers, and other parts for the roller mills are processed by milling, turning, or drilling. This means that, for example,



The flexibility achieved by the K20 AMF zero-point clamping system is particularly noticeable on the DMG machine



As the AMF zero-point clamping makes it so easy to re-clamp, replacement parts that are unplanned and need to be produced quickly can be incorporated into the production process without any problems



"With the AMF zero-point clamping modules, we have been able to improve our manufacturing flexibility enormously," emphasises Carsten Aeilts (centre), general manager at KOCKS Manufacturing GmbH & Co. KG, Kai Staschen, KOCKS (left), Michael Gödecke, AMF (right)



The extra-strong K40-H AMF modules are used for heavy-duty cutting

complex lubrication grooves can be inserted or sophisticated spindles can be created. It takes three hours to process some workpieces which are clamped directly with AMF pull-studs. "We are happy to support our customers to determine the optimal position of the drill holes for the pull-studs," explains Michael Gödecke. 15 to 20 tools are used. The machine collects them directly from the tool store and changes them automatically. On a total of twelve pallets, additional key elements are waiting to be processed in various stages of completion. These are prepared in parallel to production time at a setup station.

A standard hydraulic unit is used to open the clamping modules. For the milling/turning application, however, this is also equipped with controls and a traffic light system which is easy to read. This signals the clamping status of the clamping station and releases the workpiece for processing. In total, clamping is required three more times now to complete the key elements. Apart from the setup time this saves, it also reduces the number of error sources which are always possible with every clamping operation.

Impressive results

Because the AMF zero-point clamping modules provide such impressive results in

reducing setup times, KOCKS has decided to use the technology on two more machines. These include a huge Union drilling rig with a 2,000 x 2,000 mm machine table and a clamping profile sized 1,000 x 1,000 x 2,000 mm. The extra-strong K40-H AMF modules are used for this heavy-duty cutting in a setup station for direct clamping of the workpiece and also in an individual station for holding base plates or fixtures. These realise 40 kN pull-in / locking forces as well as 105 kN holding force with a diameter of 148 mm. The modules are opened hydraulically and lock mechanically using spring force. The module is clamped without using any pressure meaning that the pressure line can be removed at any time.

The K40 modules have an unusual feature for direct clamping of the workpiece. At 300 mm tall, they are high enough for the workpiece directly clamped with pull-studs to be processed from five sides and the table does not get in the way. Apart from that, two of the four modules are also height adjustable; using a thread with a pitch of 0.75 mm and a diameter of more than 150 mm, the modules can be adjusted in 0.05 mm increments. This means a total height adjustment of five mm (± 2.5 mm) can be realised. Kai Staschen really appreciates this: "This increases our flexibility for production even more."

Flexibility raises productivity with a third shift

Bevel gears and levers are mainly produced on an additional DMG processing centre. "This is where the flexibility achieved by the K20 AMF zero-point clamping system is particularly noticeable," explains Kai Staschen. "As zero-point clamping makes it so easy to re-clamp, replacement parts that are unplanned and need to be produced quickly can be incorporated into the

production process without any problems. After that, the part which was being processed beforehand can simply be clamped into place again and processing can continue without any significant setup times being required and the team leader of cutting then mentions another advantage. Then, at the end of the second shift, the workpieces can be unclamped regardless of their state of completion, making room for another part with a longer processing time. We are planning to introduce a third shift soon requiring virtually no manpower."

Market leader in machine table clamping

Andreas Maier Fellbach (AMF), originally founded in 1890, is a one-stop supplier in clamping technology and today is one of the world market leaders. 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 2016, AMF achieved a new record with €44 million in revenue.

Andreas Maier GmbH & Co KG

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MACH Stand: 17-22

New chucks demonstrate MAPAL brilliance

For over 25 years, MAPAL has built up a broad portfolio of clamping products that ranges from the clamping cartridge to the application-specific hydraulic chuck. Now, MAPAL is announcing an entirely new appearance for these items.

By redesigning product lines, the complete range will now have a uniform appearance and simultaneously offer added value for customers by utilising intelligent design strategies. Until now, industrial product design has played a less significant role during the development of chucks at MAPAL with the focus primarily on reliable functionality. As a result, the developers at MAPAL have gradually built up a broad portfolio that did not have a uniform appearance. To further enhance this, the company involved experts from an award-winning design agency in Schwaebisch Gmuend, Germany.

Carefully considered design taps potential

The remit was to revise the appearance of the chucks while adding value for the customer by means of carefully considered industrial design. An ingenious design is not only a visual highlight, it also taps into economic and ecological benefits for both MAPAL and its customer base. Using this as a starting point, the product designers worked in synergy with product developers at MAPAL, building completely new concepts that are based on functional FEM analyses to improve performance, ergonomics and economy for end users.

Developed according to this design brief, the new chucks shine with proverbial brilliance. One of the elements in the new concept is the brilliant surface finish. This surface finish is credit to a specially developed polishing method that ensures the chucks are more resistant to corrosion than previous versions.

Foolproof handling

A further design requirement was foolproof-handling, creating something that creates easy and self-explanatory handling of chucks. Operational elements were to for customers to be able to quickly identify the chuck of choice with handling information also being self-explanatory. These requirements were addressed by the blue colour of features such as the actuating screws on a hydraulic chuck and by internally developed symbols that contain corresponding information, irrespective of the related language.

Finally, the product engineers and design engineers studied and



optimised the chucks by undertaking a complete review of the weight, material selection and size. The new design addresses the requirements for the greatest possible stability and vibration dampening characteristics. Even the smallest weight savings on chucks have a major impact that becomes apparent over time. A lightweight chuck will consume less energy during acceleration and deceleration of the spindle.

Corporate design creates recognition

With a new corporate design, the complete clamping range can now be immediately identified as stemming from the MAPAL stable. This is of critical importance for MAPAL, as the company has not historically been perceived as a manufacturer of chucks.

MAPAL Präzisionswerkzeuge Dr Kress KG is one of the leading international suppliers of precision tools for the machining of practically all materials. The company founded in 1950 supplies leading customers from the automotive and aerospace industries and from machine and plant engineering. With its innovations, the family-owned company sets trends and standards in production and machining technology. MAPAL sees itself as a technology partner, supporting its customers with the development of efficient and resource-conserving machining processes using individual tool concepts. The company is represented with production facilities, sales subsidiaries and representatives in 44 countries worldwide. In 2018 the MAPAL Group had 5,500 employees, generating sales of EUR 640 million.

UK subsidiary MAPAL Ltd was founded in Rugby in 1993 and since then has ensured fast, direct contact to customers in Great Britain for sales and service. Currently there are around 50 employees at MAPAL Ltd, which also offers engineering and other services from the MAPAL range.

MAPAL Ltd also has a production unit to be able to offer direct service and short reaction times.

In 2015 the Northern Irish company Rainey Engineering was acquired in order to expand the production and regrinding capacities and possibilities in the solid carbide range.

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Handling and clamping of workpieces and dies

Robotic handling cells automate machine tool operation

Best known as a supplier of high quality manual, hydraulic, electro-mechanical and magnetic workholding equipment manufactured in Germany and Austria, including those marketed under the Hilma, Stark and Rivi brand names, Hitchin-based Roemheld UK will announce at MACH 2020 a significant diversification to its handling product range. Alongside workpiece manipulators, the company will launch a new suite of cells designed to automate machine tool tending and add extra processes beyond just workpiece handling and storage.

The ProModul concept from Hilma is centred on a core 'R' module, enclosed all-round for safety and equipped with a FANUC 6-axis robot and two workpiece drawers. It provides a base level of automation for unattended production on CNC lathes, machining centres or other machine tools such as spark eroders. It also introduces the possibility of using a double gripper arrangement to progress components from Op 10 to Op 20 without manual intervention. Gripper exchange can be similarly automated to allow families of parts to be produced autonomously.

Where the system differs from others on the market is the availability of additional, dedicated, compact ProModul elements that can be positioned next to each other alongside the robotic handling module for performing operations such as deburring, measuring, engraving and assembly. The higher repeatability that is possible compared to an operator performing these tasks not only automates the processes but also tends to raise the quality of production.



With the new Stark robot gripper from Roemheld, hydraulic, pneumatic and electrical supplies required for unclamping and clamping are transferred via a multiple coupling integrated into the pallet gripper



Roemheld's new ProModul R robotic component handling station from the group's Hilma division, designed to automate the operation of machine tools. Add-on modules are available for operations such as deburring, measuring, engraving and assembly

The effect is to relieve the machine tool of these extra duties, which would otherwise consume time after the main machining cycle has been completed, yet still allow the user to benefit from complete machining of components. While it is possible to include some of these further operations in the main program, it is rare to find assembly tasks such as press-fitting incorporated into a machine tool.

Production output can be raised by combining more and more ProModul cabinets for completing the processes. Components are transferred between stages automatically by a variety of handling methods, according to requirements, and workholding is included as part of each package. Maximum workpiece weight allowable using the standard robot is 6.5 kg, although heavier duty models may be selected.

New robot gripper has services built in

From the group's Stark division and on show for the first time in the UK will be a robot gripper with zero point clamping for automated pallet exchange on machine tables without their own media supply. The services needed for clamping and releasing the workpiece, whether hydraulic, pneumatic or electrical, are all transferred to the clamping plate via a multiple coupling integrated into the robot's pallet gripper.

First shown at EMO in Hannover last September, the system is supplied to suit the user's requirements and is a cost-effective, entry-level solution to automated production that may be retrofitted at any time. Implementation is short owing to the system's standardised coupling and flexible modularity. Process safety is assured by air blow removal of swarf and automatic checking of correct component seating, clamping and release.

New fail-safe pneumatic swing clamp

On display for the first time will be Roemheld's pneumatically actuated swing clamps incorporating a mechanical locking action, whereby the full holding force (between 200 and 600 N) is maintained in the case of air pressure reduction or loss, ensuring operator safety and avoiding the production of scrap. Operating pressure is between two and six bar.

The clamp is a pull-type cylinder with a piston that is automatically locked when the workpiece height is within the designated clamping range, after which the air line can be depressurised or uncoupled, for example during pallet change. For unclamping, which is monitored, only the minimum pneumatic pressure is needed.

A feature of the clamps is a pair of flow control valves that can be easily adjusted from above. They allow the speed of the

sturdy swing mechanism to be reduced if the flow rate is too high or when the clamping arms are of larger mass. It also



In Roemheld's new pneumatic swing clamps, a mechanical lock ensures that the clamping force is maintained even when the pressure drops so that the workpiece remains safely in position

enables synchronisation or sequencing of the closure of several connected clamps. Swing angle is normally 90 degrees clockwise or counter-clockwise, although it can be 60 degrees, 45 degrees or absent (0 degrees).

If machining dry or with minimum quantity lubrication, the wiper can be protected from the ingress of small particles by an additional wiper ring.

Vices for 5-axis machining now include floating clamping point model

Two vices designed for workholding on 5-axis machining centres will be exhibited.



Roemheld's range of MC-P Z Balance vices for 5-axis machining will make its first appearance at a MACH show

The Hilma MC-P can grip on just 3 mm of material, reducing raw material costs, and offers high stability and precision combined with excellent accessibility and comprehensive chip protection. The compact design enables collision-free tool paths and the use of short, standard tools for multi-axis machining.

Offering centring or clamping functionality, it is suitable for a wide range of applications including securing long components and housings made from cast materials. Mechanical and hydraulic versions are available and jaw widths range from 40 to 125 mm, with maximum clamping forces of 8 kN to 35 kN.

Another workholding system appearing for the first time at a MACH show will be the division's range of three MC-P Z Balance vices, which have a floating clamping point to avoid stressing or deforming the component being secured. After operation of the spindle, clamping range being from 6 to 400 mm according to model, first the two slides concentrically approach the workpiece. When the first jaw reaches it, just the second jaw advances until they are both in contact with the component. Only then is the desired clamping force applied.

New press working and moulding products

From its position within the Metalforming Machinery Makers' Association's metalworking village in **Hall 20 Stand 631**, Roemheld will promote the group's wide range of products aimed at the press working and moulding industries, including die clamping systems, handling carts, carrying consoles and roller and ball bar elements.

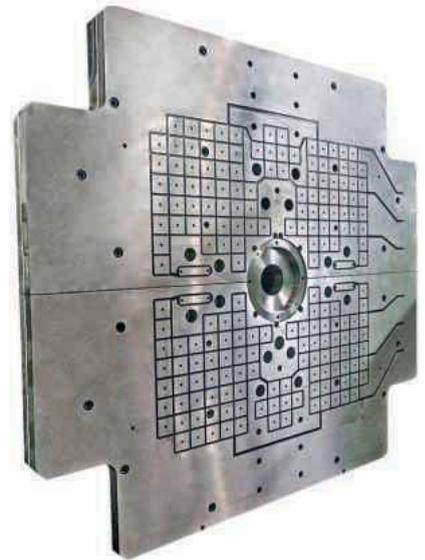
New to MACH will be the Industry 4.0 press system Flexline for automatically clamping almost any die on the ram of a wide variety of press models. It uses integrated sensors to measure real-time data on holding forces and transmit the information to the machine control.

The operator has access to information concerning the actual clamping force on the die and is immediately able to detect overloads, the occurrence of unusual forces during operation, and die wear and breakage. The system, which is suitable for either factory installation or retrofitting, facilitates error analysis and enables rapid problem-solving when servicing is required.

Roemheld's Rivi division, a manufacturer of magnetic clamping plates for securing dies and moulds, will stress its pedigree as a

supplier not only to the plastics injection moulding sector but also unusually to the rubber industry. The customised M-TECS products are uniquely able to withstand elevated temperatures up to 240°C encountered in such presses and can generally be retrofitted within a few hours.

Dies and moulds made from ferromagnetic materials can be clamped and subsequently released over their full surface area and high plate stiffness resists bending. The systems work without electrical power and require only a short current pulse lasting a few seconds to activate and deactivate the magnets.



Magnetic die clamping systems from Roemheld Rivi can withstand temperatures up to 240°C and may be configured flexibly with regard to size, geometry, clamping force and fittings

Permanent magnets generate a field that penetrates a few millimetres into the tool and hold heavy mould halves weighing several tons in the correct position, bringing them together with absolute parallelism. Even moulds with complex geometries can be precisely clamped without deformation. Uniform distribution of the clamping force ensures low die wear.

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MACH Stand: 7-430

Gewefa unveils new products at MACH

Gewefa UK will be introducing its substantially enlarged Hydro-Pin range of single point boring bar toolholders at MACH while also providing the opportunity for visitors to view and discuss a range of new products available from its partners. Apart from its own brand toolholders, Gewefa will be featuring equipment from EWS, OTT-Jakob, Pibomulti, Nann, Rineck and, for the first time, products from the Fahrion Precision Centro P Premium range of collet chucks.

There are now a number of new variants of the hydraulic Hydro-Pin toolholder to accommodate a wide selection of boring bar shanks, many with their own location configurations. Features common to all include substantially reduced setting times, by as much as 75 percent and up to 50 percent increase in cutter life due to the more secure, vibration-free grip.

In all formats, a paramount feature of the design is the need to eliminate run out with a guaranteed centre height at the insert tip being essential for successful high precision machining. There is also guaranteed repeatability when changing like-for-like bars and a simple, fool proof fitting process.

Being a hydraulic chuck, Hydro-Pin removes the need for reduction sleeves when securing the bar, guaranteeing anti-vibration damping and reducing the

opportunities for inaccuracy and bar deflection during the boring process.

The most common location format in proprietary systems features a ground angle on the back end, of the bar, locating against a stop pin at the base of the toolholder. This ensures precise central positioning and orientation with the bar then locked into the hydraulic chuck. Gewefa also supplies more bespoke variants such as required for the Coromant Easi-Fix boring bar shank which features a spring plunger mounted in the toolholder body.

Gewefa offers the hydraulic chuck for ARNO, System Dieterle, DTS, HOBE, MAS, SUMITOMO, SANDVIK, SIMTEK and VARGUS screw orientation options along with all other systems.

Also on the Gewefa stand will be exhibits from all six of Gewefa's partners. EWS, the driven tool experts, are introducing a new intelligent tool monitoring technique called CyberCon4 which monitors a range of processes within the tool in order to optimise its performance.

German machine tool accessory specialist OTT-Jakob will be featuring its new all-in-one rotary union with an innovative monitoring function. The 2KA-ME union combines proven twin channel technology for the hydraulic release and integrated media transfer with state-of-the-art

clamping condition sensor technology. Also featured from OTT-Jakob will be the highly acclaimed Power Check spindle monitoring system.

Swiss speeder and angle head specialist Pibomulti has a further addition to its Rainbow range of angle heads, this being a head able to clamp up to a Ø12 mm tool shank via a Gewefa hydraulic clamping system.

Heat shrink clamping machine expert Rineck will be featuring toolholders and cutters from its range, while collet specialist Nann will show two latest developments; a new MSK manually operated collet chuck and a spindle unit range for use with draw-back collets, dead length collets and expanding collets.

Finally, the newest partner Fahrion will be featuring products from the Fahrion Precision Centro P Premium range of collet chucks, the Ultra Power Chucks, Dynamic Performance Chucks and Mini Precision Chucks.

The standard Centro P collet chuck system is widely available with features integral to all Fahrion systems including the tried-and-tested Fahrion 'Protect' coating on the collets. However, features of the premium specialist programme create new application areas and opportunities.

Gewefa UK Limited was established in 1990 and has rapidly established itself as a leading independent supplier of toolholding and allied equipment. Based in Corsham, Wiltshire, Gewefa UK is a subsidiary of Gewefa GmbH, a family owned business established 60 years ago in Burladingen, Germany.

As part of its development strategy, Gewefa UK has built strong relationships with leading like-minded organisations allied to its toolholding expertise. As such, Gewefa is able to offer its customers equipment such as angle heads, driven tools, power drawbars, collets, pre-setters and measuring equipment from some of the world's leading names.

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MACH Stand: 20-652



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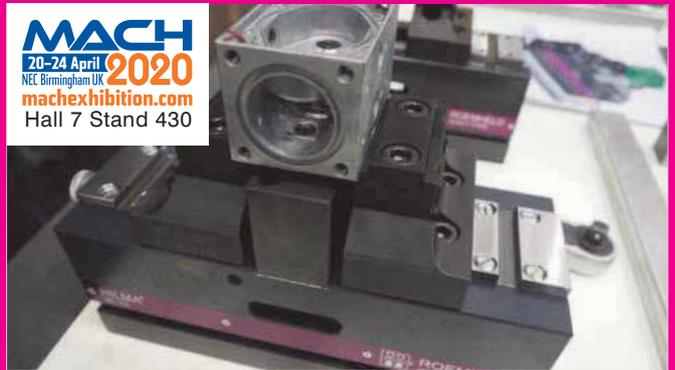
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XLeader offers Rapid Change results with new MicroCentric chucks

Available from exclusive UK and Eire agent, Leader Chuck Systems, the MicroCentric KSF RC (Rapid Change) high precision power chucks offer machine shops a number of advantages. Available in two diameters, the chucks feature MicroCentric's patented rapid change jaw system that can reduce changeover times on CNC lathes and turning centres to a minimum.

Mark Jones, managing director of Leader Chuck Systems, says: "Quick-change chuck jaws make unarguable sense in any high variation workshop production scenario. Simply put, there are only two states a machine tool can be in that really matter to any workshop: in production, making parts, or not. When a machine is making parts, it is making money. When a machine is not making parts, it is costing money. Therefore, any reasonable investment that helps a machine make parts more of the time is going to improve business performance. These MicroCentric chucks fit the reasonable investment profile perfectly."

The KSF-08/RC is a 210 mm diameter chuck with a 66 mm through hole while the larger KSF-10/RC is 254 mm diameter with an 82 mm through bore. Both are rated up to 5,000 rpm and can be specified with A2-5, A2-6 or A2-8 spindle mounting plates.

Featuring a boltless design, the rapid change jaws on the KSF range offers a full jaw area for clamping. Supplied soft as standard, with hard jaws available as an option, they can be exchanged in seconds but remain precise. The KSF chucks have a repeating accuracy of 0.0025 mm, such that when top jaws are finished machined on the chuck MicroCentric guarantee that parts will



run within 2.5 micron radial and lateral TIR if the top jaws are not removed from the chuck.

After machined top jaws are removed and then replaced onto the same base jaw they were machined on, a maximum runout of 0.025 mm TIR is guaranteed. A graduated scale engraved into the master jaw facilitates quick precise positioning of the top jaws during changeover.

If a higher level of accuracy is required after top jaws are changed, the radial runout of KSF chucks can be adjusted. Since the spindle adapter mounts to the spindle nose and the chuck then mounts to the adapter plate, the radial runout of the clamped part can be corrected to between 10 and 20 micron by a unique MicroCentric feature. The chucks feature four radial adjusting screws on the outer diameter of the chuck body to achieve this and once the runout of the part has been adjusted the repeatability of the chuck is assured for subsequently clamped parts.

Precision fit master jaws minimise lift with a wedge design securely pulling the jaw down onto precision serrations. Pitched at 1.5 mm, the serrations aid the extremely quick location of each of the three jaws. While hardened chuck bodies, actuators and master jaws ensure long-term accuracy and performance.

Mark Jones puts the investment into perspective: "Say your machine time is charged out at a very reasonable £40 per

hour and it takes half an hour to change jaws on average; that means a jaw change costs you £20. However, MicroCentric's rapid change jaw system cuts the time to under five minutes, meaning you get back at least an extra £15 worth of machine time with each jaw change and that is per machine. Add up all the jaw changes over the course of a year and you will be surprised just how big that number gets."

He concludes: "Unlike competitive quick-change jaw systems that feature relatively expensive replacement jaw sets, MicroCentric is going to keep the cost of the jaws reasonable so there is no cost penalty for workshops looking to access the benefits available."

Founded in 1969, MicroCentric has, for nearly half a century, been advancing engineering and high-quality manufacturing. This has earned the company the reputation of being one of the global leaders in precision workholding technology. Each MicroCentric product is backed by superior design, the highest quality materials and precision workmanship for reliable, long-term performance and unmatched accuracy.

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Email: information@leaderchuck.com
www.leaderchuck.com

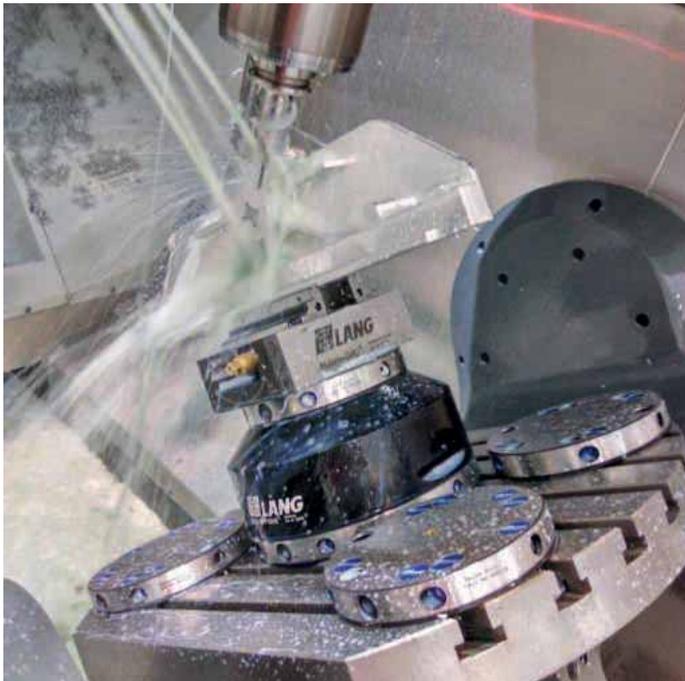
MACH Stand: 18-18



Lang Technik UK 'holds court' at MACH

Following many years of providing leading Lang 5-axis workholding and automation systems through a UK agent, Lang Technik UK has been established to provide both existing Lang users and new customers with first-class levels of sales and application support. The staff of Lang Technik UK invites all current and potential users to visit its stand at MACH to explain their workholding needs and to witness demonstrations of the company's renowned products.

Amongst several other advanced workholding systems, Lang Technik UK will be exhibiting Makro•Grip® the original and still the leading form-closure technology that provides the highest holding power for 5-face machining. Makro•Grip uses innovative pre-stamping, a technology specifically developed by LANG, where the workpiece is stamped outside of the machine tool with up to 20 tonnes of pressure before being clamped in the Makro-Grip 5-axis vice. Components requiring high holding power, but are also prone to deformation, can be securely clamped by using the highly secure stamping process.



The Makro Grip vices also offer unrivalled tool accessibility for full five-face machining operations. The speedy, efficient pre-stamping process eliminates the need for the vice to exert unnecessary pressure on the workpiece which in turn means that uses tools do not fight against the clamping force of the vice. This results in vastly improved surface finishes and part tolerance outcomes.

Also being demonstrated will be Lang Technik's famous Quick-Point system. Quick-Point acts as a highly effective interface between the machine table and clamping device and is offered in an extremely wide range of variants. The fast, accurate and repeatable system allows users to considerably reduce setup times and to constantly adapt to the changing needs of their business. Offering round, rectangular or square plates, for single or multiple clamping, Quick-Point is able to provide a cost-effective solution for every machine table and application.

It can be used in vertical and horizontal machining centres, on 3- and 5-axis tables and 4th axis rotary or trunnion systems. The

attachment of the zero-point plate to the machine table or faceplate is achieved easily through the use of a prefabricated hole patterns for common t-slot distances, bore patterns and bolt circles or individual, customised mounting options.

Lang Technik UK director, Gareth Barnett says: "Although we have many competitors and imitators, Lang Technik is the "original" and remains at the cutting-edge of workholding design and manufacture. We are proud to be backed by the engineering, design, product knowledge and years of experience of Lang Technik Germany.

"Our team of experienced engineers have many years of machine tool experience and applications related to workholding. We are looking forward to greeting both current and potential Lang workholding customers at MACH."

Lang Technik UK has been established to provide existing Lang users and new customers sales and application support, when using Lang 5-axis workholding and automation systems.

It is proud to be backed by the engineering, design, product knowledge and years of experience of Lang Technik Germany.

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MACH Stand: 17-40

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All round turning grade unveiled by CERATIZIT

Cutting Solutions by CERATIZIT, a product brand of Team Cutting Tools, has introduced its latest grade for turning, CTPX710, which is set to reform insert choice for customers.

Developed as a multi-application grade utilising new coating technology and new carbide substrate, CTPX710 now means one grade can be used across many material groups from super alloys to general steels and non-ferrous materials. The result is reduced tool inventories and simplified toolchanging for machine operators, with just insert geometry changing to suit specific materials, the grade remains the same.

The success of CTPX710 is the unique partnership between the carbide substrate, the latest Dragonskin coating technology, enhanced by a secondary finishing process after coating. The new substrate is a fine-grain carbide with an optimised microstructure that provides a hard, wear resistant base onto which the Dragonskin coating is applied. For CTPX710 inserts the coating thickness has been increased, which provides additional damping/shock absorbing effect to further protect the substrate. During manufacture, once the coating has been applied, the inserts are then subject to a further finishing process to create the smoothest surface possible across the insert geometry and enhance chip flow. It is this combination that enables CTPX710 to be applied across such a diverse range of materials, while delivering improved cutting performance and process security.

"The arrival of CTPX710 means that customers only need one grade of carbide to cover the vast majority of the work they will be undertaking. This is especially important for the large numbers of small to medium sized subcontract machine shops that take on a diverse range of work, they can now reduce tool inventories in the knowledge that they have an insert grade that will handle all of the materials they may be faced with," says Adrian Fitts, business development manager, Ceratizit UK & Ireland. "While the all-round performance of CTPX710 is unquestionable, we are finding

it delivers excellent results when machining stainless steel and duplex and super alloys, and this is of particular interest to many customers in the UK and Ireland."

CTPX710 inserts are available in a wide variety of standard ISO insert shapes with

the forerunner in the fields of sophisticated carbide solutions for the cutting tools industry. It controls the entire process chain in the production of its carbide products and can thus guarantee extraordinary quality.

The success factors are performance-



CTPX710 is a multi-application grade that is set to reform insert choice for customers

three insert geometries available, these being -M34 which is aimed at turning super alloys due to the low cutting forces it generates along with its resistance to built-up edges. For non-ferrous, steels and cast iron there are two available geometries -25P and -25Q, the former having a sharp cutting edge providing good swarf control on softer materials, while the latter features wiper technology to deliver higher feed rates and improved surface finish. As with all tools from the Team Cutting Tools product brands these inserts are available ex-stock with guaranteed next-day delivery before noon when ordered up to 6:30 PM the previous day.

More detail on CTPX710 can be found at <https://cuttingtools.ceratizit.com/gb/en/x7>

Cutting Solutions by CERATIZIT is a sub-brand of the CERATIZIT Group. It develops, produces, markets and supports leading technology solutions for customers in the metalcutting manufacturing industry on a global scale.

For over 90 years, CERATIZIT has been

optimised standard products for turning, drilling, milling and reaming technologies, as well as innovative, custom solutions for select industry sectors such as automotive, power engineering, heavy machining or aerospace. The same goes for inserts and their accompanying tools as well as for drilling and milling carbide tools.

For those customers who do not wish to take advantage of the knowledgeable support of CERATIZIT's in-house sales team, the E-Techstore business platform provides stock availability check and ordering options for all clients 24 hours a day, 7 days a week. You can now order one of the over 25,000 products available from the comfort of your own tablet or smartphone.

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MACH Stand: 18-210

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Guhring raises the standard with new drilling line

Renowned for its expertise in drilling and threading, the Guhring stand at MACH will be the place to visit for all your drilling and holemaking requirements. At the event, Guhring will be introducing its ground-breaking new RT100XF alongside a host of additional holemaking innovations that will include the HT800 indexable head drills, the EB80 gun drills and the HR500 reaming lines.

Taking centre stage amongst Guhring's extensive holemaking portfolio at MACH will be the new RT100XF. Providing unbridled power and outstanding results guaranteed, the holemaking benchmark has been taken to a new plateau with the RT100XF.

Branded as 'Extreme and Powerful', the new RT100XF has been developed with all tool parameters optimised to generate outstanding feed rates and exceptional metal removal rates. Created to reduce cycle times for difficult-to-machine materials and special applications in series production, the extremely hard new drilling line is said to be extremely resilient to potential breakages.

This bold claim is based upon the new carbide grade developed by Guhring for the RT100XF that performs a balancing act between hardness and toughness. The



special structure of this Guhring created carbide grade has a re-sharpening effect, so breakages that normally accelerate tool wear, no longer occur. This is supplemented by the proven nanoFire coating system that has been created by a specially designed pre- and post-treatment that smooths the coating and makes it significantly more robust.

The design and geometry of the new RT100XF supports the robust performance of the carbide grade and surface treatment with an early double margin support that perfects the coaxiality to ensure perfect bore size and roundness. This makes the RT100XF the drill of choice for precision, concentricity and performance for hole making from 5xD upwards. Furthermore, polished flutes reduce the heat transfer to the component, this also supports the fast evacuation of chips and thermal changes such as hardening are avoided. The new through coolant drills are perfect for the drilling of structural and case-hardened steels, free-cutting and heat-treated steels, nimonics, titanium, inconel and hastalloy, making the RT100XF the perfect complement for any machine shop.

Available in 5XD and 7XD, the new drills can be purchased in diameters from 3 mm to 20 mm diameter with 0.1 mm increments.

Alongside the new RT100XF at MACH will be the HT800 WP indexable insert drilling system. Developed for extreme process

reliability, the HT800 WP range is available in diameters from 11 to 40 mm with drilling depths of 1.5XD, 3XD, 5XD, 7XD and 10XD. Offering interchangeable inserts for steel, stainless, cast iron and aluminium alloys, the HT800 WP is the perfect all-rounder for all your drilling requirements. With a vast array of insert geometries and grades, drill body diameters and lengths, the HT800 WP will certainly attract attention at MACH.

For the longer, deeper and more challenging holemaking requirements, Guhring will be introducing its single fluted EB80 XXL gun drilling series at MACH. The company has paid attention to the demands of the marketplace, expanding the existing range with four new drilling lengths that are also available with a hugely expanded diameter range.

The especially long, single-fluted gun drills with brazed carbide heads are now available in eight different lengths from 600 mm to 2 m. The EB80 XXL enables much faster processing times compared to conventional spiral deep-hole drills; this is credit to the polished flute that guarantees excellent chip control and the best possible protection against wear when drilling steel and non-ferrous metals. The TiN coating further extends service life and makes the EB80 XXL optimally suited for deep drilling machines and for use in mould and die applications.

Complementing the drilling lines at MACH will be the extended HR500 solid carbide universal reaming line. The impressive HPC reaming line operates at the highest possible cutting rates with the result being holes of the utmost in precision, concentricity and surface finishes. The HPC line is suitable for finishing holes on a vast array of materials that include a variety of steels, aluminium alloys, cast materials, plastics, magnesium alloys, copper, brass and much more.

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New "cutting edge" technology from Walter

Extended tool life with new TC410 Advance thread former

The announcement of the TC410 Advance HSS-E thread former means tooling expert Walter GB can now offer customers thread generation tooling covering more than 200 thread dimensions and tolerances.

With TiN coating, the new HSS-E tool can be used to form blind and through-hole threads (metric, metric fine, UNC/UNF and G) in all materials in the ISO groups P, M and N, as well as ISO K and S.

Importantly and, in addition to the general advantage of eliminating 'tool wedging' due to trapped chips which means high process reliability, the TC410 Advance expounds reduced wear and therefore extended tool life due to its geometry and post-treatment process.

Its innovative profile reduces cutting time which, in turn, minimises friction and the amount of heat generated. Tool life also benefits by the tool's extremely smooth surface, which reduces torque requirements.

The resulting ability to produce more threads with the same tool equates to a thread former having an excellent price-to-performance ratio and one that is ideally suited to medium to large batch work.

Walter GB offers the TC410 Advance in two variants: without lubrication grooves or with grooves for deeper threads up to 3.5 x diameter.

Replaceable front end indexable insert body extends milling applications

Tooling expert Walter GB is using a replaceable front end for its modular M4258 porcupine milling cutter for shoulder and



Walter's TC410 Advance HSS-E thread former

face milling to combine the cost-effective benefits of rigid milling with those of indexable inserts, continuing the Walter trend to save users' tool costs through reduced tooling inventories.

The fast and easy replacement of the tool's front piece, the part of the tool that typically becomes worn most quickly – the front end face and initial shoulder, where the machining forces are greatest – means that the M4258 cutter can continue to be used cost effectively.

The M4258 system inserts are available as square with four cutting edges and as rhombic with two cutting edges, for not only porcupine milling cutters but also for face, shoulder, chamfer and T-slot milling cutters also available in the M4000 cutter range.

In addition, different insert geometries such as the D51 anti-vibration type allow the cutter to be used in difficult cutting conditions, and Tiger-tec Gold inserts are available within the range to produce further tool life benefits.

Walter Capto C6 and C8 interfaces ensure positive-locking connection for a tool that provides good chip clearance and internal cooling for high process reliability and safe chip evacuation.

Available in diameters from 50 mm to 80 mm, the M4258 cutter with M4000 inserts is suitable for applications in cast iron, steel, stainless steels and materials with difficult cutting properties.

Walter AG was founded in 1919 and is now one of the world's leading metalworking companies. As provider of specialised machining solutions, Walter offers a wide range of precision tools for milling, turning, drilling and threading applications. Walter works together with its customers to develop custom solutions for fully machining components for use in the aviation and aerospace industries, as well as automotive, energy and general engineering. The company demonstrates its Engineering Kompetenz at every stage of the machining process. As an innovative partner capable of creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With over 3,500 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries.

Walter GB Ltd
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www.walter-tools.com



Walter's modular M4258 porcupine milling cutter

MAPAL has efficiency in store with new UNIBASE-S

MAPAL has now enhanced the UNIBASE-S single automatic dispenser and optimised the ergonomic aspects to improve ease-of-use for the end user when storing and managing frequently required consumables. The display unit is now on the top of the UNIBASE-S device, making operation easier and more ergonomically friendly for the shop floor users.

The software has been completely changed to the UNIBASE software system and this enables the new UNIBASE-S single automatic dispenser device to be coupled to existing UNIBASE systems or alternately be used as a standalone solution.

With its extremely compact dimensions, the UNIBASE-S dispensing system can be installed directly on a workbench. For example, the 96 or 192 compartments are perfect for storing indexable inserts, cutting tools, chucks or even personal protective equipment. The ability to have the compact system close to the workstation or operator can save the employee significant time with the continual trips to a central warehouse or stores area.

Removing consumables from the UNIBASE-S is quick and uncomplicated and shop floor staff can access supplies in just a few short steps. Initially, the employee must log-in to the device via the touchscreen, to make this even faster shop floor staff can log-in even faster via an RFID chip or fingerprint. Only registered employees can remove articles from the system. If an employee is not logged in, it is not possible to turn the dispensing drum and the dispensing compartments remain locked.

After the desired article has been selected via the UNIBASE software, an LED identifies the compartment with the corresponding article. The dispensing drum is then rotated manually to the withdrawal position where the team member can access their consumable. After opening the dispensing compartment, the system automatically registers the removal of an article. The software identifies the removal of consumable stock and automatically updates stock levels. The ingenious software can provide comprehensive reporting for the customer to enable them



to monitor and measure consumable usage, thereby providing improved visibility, control and subsequently reducing costs.

MAPAL Ltd
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www.mapal.com

MACH Stand: 18-330

Kennametal makes hard turning more cost-effective

New KBH10B and KBH20B PcBN grades deliver higher productivity and lower cost-per-part

Kennametal has announced its latest innovation in hard turning-KBH10B and KBH20B PcBN grades, double-sided inserts for materials up to 65 HRC. The new grades are specially designed to deliver higher productivity and longer tool life when turning tool steels and other hardened materials.

"Kennametal's new KBH10B and KBH20B grade inserts are an excellent choice for high-volume production of hardened gears, shafts, bearings, housings, and other drivetrain components, where tooling cost per part is an important metric," says Robert Keilmann, product manager, Turning.

Polycrystalline cubic boron nitride (PcBN) mini-tipped inserts have long been recognized as a great option for reducing part cost when turning hardened steel components. Kennametal's new grades of PcBN inserts improve upon that value proposition by delivering increased productivity with a lower cost-per-part. features include: Patented ceramic binder

structure and TiN/TiAlN/TiN coating that provides extreme wear resistance even at elevated cutting speeds.

A gold PVD coating makes it easy to identify when an insert needs indexing, while the numbered corners assure that a machine operator won't inadvertently switch to a used edge.

Two edge preparations in a "trumpet" style hone for heavier and interrupted cuts, and a light hone for continuous turning. Both are free cutting, further extending tool life and generating surface finishes down to 0.2 Ra.

The PcBN mini-tips are offered in four insert shapes: three rhomboidal and one triangular, which means up to six cutting edges per insert.

Kennametal UK Ltd
Tel: 01384 408060
Email: anna.mason@kennametal.com
www.kennametal.com



Kennametal's new KBH10B (45% PcBN content) and KBH20B (60% PcBN) mini-tip: two grades, four shapes, a variety of corner radii, and twice as many cutting edges per insert

WIDIA announces new fast and simple tooling data solution

The WIDIA NOVO online platform available in the UK from Industrial Tooling Corporation (ITC) now allows tool assemblies to be directly imported by users of Mastercam, thanks to a new collaboration. The partnership between WIDIA and CNC software developers Mastercam provides a solution that enables information importing from NOVO directly into Mastercam 2018.

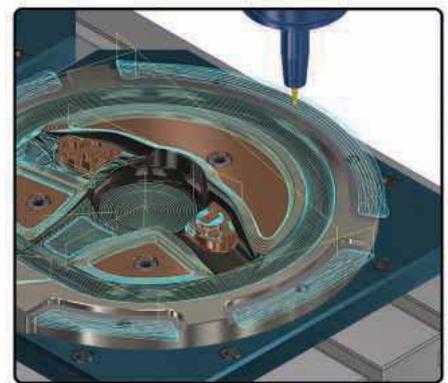
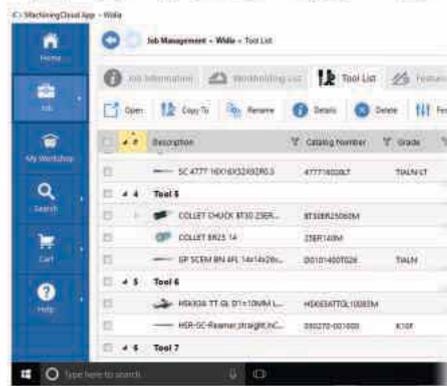
Mastercam developers have worked closely with WIDIA to enable users to import 3D tool assemblies directly into Mastercam, validate them and save the files in their Mastercam file and/or Tool Library.

Features such as automated filtering ensure that tools and holders can work together for the particular job. Users of Mastercam benefit from having the correct tooling for the material and for the type of machining operation plus an accurate 3D model that can be used for visualisation and collision checking. All this delivers significant time savings to ITC customers that are working with Mastercam and the WIDIA NOVO platform.

In the past, manufacturers may have complained of having to search through big complicated catalogues to find related tools, then having to request or build the assemblies from scratch for use in systems such as Mastercam. With the integration of WIDIA NOVO and Mastercam, end users save significant time searching for desired tools and building 3D tool assemblies that

can be brought directly into Mastercam for easy use by most shops. Accurate tool definitions are a critical factor in modern CAM applications and toolpath algorithms take advantage of these definitions to

leads to less misapplication of tooling solutions, more optimal machining strategies and increased productivity with better quality in the manufacturing environment."



provide safe and efficient motion. In addition, the models imported from WIDIA NOVO help to generate accurate in-process stock models that can be leveraged in subsequent operations.

Chris Merlin, director of Portfolio Commercialisation at WIDIA, states: "One of the promises of digitisation in manufacturing is greater precision and speed through the effective use of data. This is where integration is a must. Users want their systems to work together seamlessly via simple solutions, without extra effort on their part. By connecting Mastercam and WIDIA NOVO, users can effortlessly join cutting tool data with machining data. The 3D models, drawings and starting parameters are easily available for validation and programming processes. All of this

For Mastercam users in the UK that want to streamline their tooling selection, configuration and prove-out processes, please contact Tamworth manufacturer ITC for more information on the WIDIA NOVO intelligent digital platform.

ITC is a specialist tooling supplier. Its objective is to supply customers with the best possible products, at the same time making them more efficient by introducing productivity and method improvements.

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Quickgrind has a ball with new Orbis

As leaders in the design and production of innovative cutting tool solutions, Quickgrind has now expanded its 'Infinite Possibilities' portfolio with the arrival of the new Orbis Lollipop cutter range.

Unlike most cutting tool manufacturers, the business model at Quickgrind is focused around the supply of products tailored to the demands of the end user, hence the 'Infinite Possibilities' branding. An example of this is the new Orbis series of Lollipop end mill cutters. As part of the 'Infinite Possibilities' range, the Orbis Lollipop tools can be designed to the specific dimension demands of the end-user, suiting the specific applications and material types regardless of industry sector.

The 'Infinite Possibilities' philosophy at Quickgrind means that the non-standard sizes and geometries are available to manufacturers with very short delivery times and at 'near standard' prices. Designed for 5-axis machining of intricate components with unique features, the solid carbide Orbis range enables access to difficult to reach features and surfaces. Furthermore, the

Orbis series enables manufacturers to use a single tool to follow the most challenging of tool paths and component forms.

What this means for the end user is that the Quickgrind 'Infinite Possibilities' philosophy extends beyond what is possible with tool production into what is also possible on the machine tool. The Orbis has been designed to answer many of those challenging programming concerns where standard tooling is restricted from reaching and machining the most demanding of surfaces.

The Orbis range is available in 2, 3, 4, 6 or 8 flutes with a complete variety of lollipop and shank diameters, overall lengths and a vast range of reduced neck diameters. This unparalleled diversity gives the end user complete access to the workpiece regardless of complexity. Not only does the Orbis create unsurpassed workpiece access, the spherical ball profile and unconventional geometry enable the new range to excel in terms of tool life, machining speeds and feeds and surface finish quality.

Perfect for the fine finishing of irregular or



uneven surfaces as well as the daunting prospect of tube machining, the Orbis even achieves ultra-fine surface finishes when targeting difficult-to-reach component features. This is credit to the uncompromising carbide composition of the end mills and the UK designed tool geometries that minimise vibration, even when reaching the most difficult to access surfaces.

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New burrs target demanding applications

Dormer Pramet has expanded its line of carbide burrs with new tools for machining superalloys and bolt removal. The alloy specific range has been designed to meet the most demanding metal finishing needs in nickel and titanium alloys.

With an advanced cutting geometry, the alloy specific (AS) burrs support high performance grinding and a smooth, controlled cutting action for a consistent high-quality surface finish. This makes the range ideal for deburring and chamfering in maintenance, repair and overhaul applications, in industries such as aerospace and power generation.

With nine different shapes available, the AS burrs achieve a faster cutting action with high stock removal and is included in a new set (P88006) which features a variety of styles.

Meanwhile, Dormer Pramet has launched a new range of burrs specifically designed to prepare the clean removal of broken bolts, without damaging the threaded hole or the component.

Suitable for automotive repair shops and

maintenance applications, the new burrs are available in plain cylinder with end cut and 150° countersink cut styles. A variety of diameters and cutting lengths cater for different thread sizes, with long reach and tapered shank designs for easy access.

A specially developed cutting geometry supports the grinding of case-hardened threads and maximises the potential for drilling on the centre.

The new addition supports Dormer Pramet's existing assortment of burrs for steel, stainless steel, non-ferrous material, plastic, fibreglass, composites and general machining.

For more information regarding all the latest products launched by Dormer Pramet please visit www.dormerpramet.com or contact your local sales office.

Dormer Pramet is a global manufacturer and supplier of tools for the metal cutting industry. Its comprehensive product program encompasses both rotary and indexable drilling, milling, threading and turning tools for use in a wide variety of production environments. An extensive



sales and technical support service operate from 21 offices, serving more than 100 markets worldwide. These are assisted by dedicated production facilities in Europe and South America and a highly developed distribution and logistics network.

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Software is becoming the driver for machinery investment

Rob Powell, commercial director of Lantek Systems on how the industry is changing

In the sheet metal industry, there have been some step changes in technology with the arrival of fibre laser and tube cutting lasers which have delivered major improvements in productivity and technical capability. Many companies within the industry have already invested in these machines and are looking for new ways of getting a competitive advantage.

Now, companies are thinking about how investing in MES software, which brings together a whole raft of topics including CAD/CAM, CRM, Sales and quotations, machine productivity and KPI analysis that can do far more for profitability and efficiency than upgrades to the machines themselves.

The result is that as part of any planning for future machinery investment, the first priority is the ability of the machine to integrate and communicate with the MES system. Therefore, it makes sense to pick open software which provides the maximum flexibility for machine choice and which can control and monitor other non CNC manufacturing operations.

The reality is that laser cutting is a commodity service now and cost, quality, service and delivery performance are the main differentiators between suppliers.

To get these factors right within a business is a complex task especially as companies expand with multiple machine tools, production sites and international operations, which is why investment in specialised manufacturing management software is a high priority.

For companies to achieve another leap in efficiency and productivity will require them to implement MES software. This will analyse, automate and control the administrative aspects of their businesses, help them make decisions based on evidence, make use of historic and real time data

and give them the ability to work in a close partnership with customers and suppliers.

Sheet metal manufacturing is a niche industry, where knowledge of the processes involved is crucial in arriving at the best price, quality and delivery offering. Generic MES software simply does not have this capability, hence a specialist solution is essential.

Three examples illustrate what can be done now:

This client processes over 100,000 tonnes of sheet and plate every year through a range of different laser cutting machines. The software we have supplied sorts the parts by thickness and material type. At any one time around 35 jobs can be running with 100 different parts in each job. The software resolves this problem, nesting parts and generating the CNC program automatically, which has enabled the company to increase turnover by 13 percent annually with the same resources.

Automating quotations allows this company to produce about 800 quotes each month directly from DXF files, drawings and sketches. The system knows the cut length and has different options for cutting methods and nesting as well as continually

updated material prices. This ability to accurately arrive at price and delivery has made it possible for the company to average around four days from order to delivery while making more parts and increasing profits by over 10 percent.

With three plants in the UK and plans for exponential growth, this manufacturer understands the importance of digitalisation. It generates 3,000 quotations each month and has a variety of machinery. The importance of monitoring and controlling the flow of parts through the workshop is self-evident for this company as is making use of the data for decision making. It sees the benefits of cloud computing to simplify its IT structure, allows remote working and it also anticipates integrated working with suppliers, customers and even delivery service providers. The flexibility provided by Lantek is at the core of its operation, giving it choice in machinery, the ability to integrate with other software and a path towards its ultimate digitalisation goal.

These are examples of what companies are achieving today with software that has made a fundamental difference to their businesses. Advances in the technology



within the machines will of course continue to deliver productivity improvements but, organising all the administrative tasks which go to make up a business, is an area that will deliver a step change in efficiency, customer service and profitability.

Using Lantek MES Manager, companies can introduce efficiency improvements to their businesses at their own pace. The concepts of a smart factory can be daunting however, there is no need to make the change in one step. With Lantek you can start by just



implementing accurate quotations and automated nesting then gradually building up to shop floor reporting, KPI analysis, stock control, multi-site manufacturing management and ultimately a smart factory. Furthermore, you can have the flexibility of running a mixture of different laser cutting machines according to your budget and the performance of the machines.

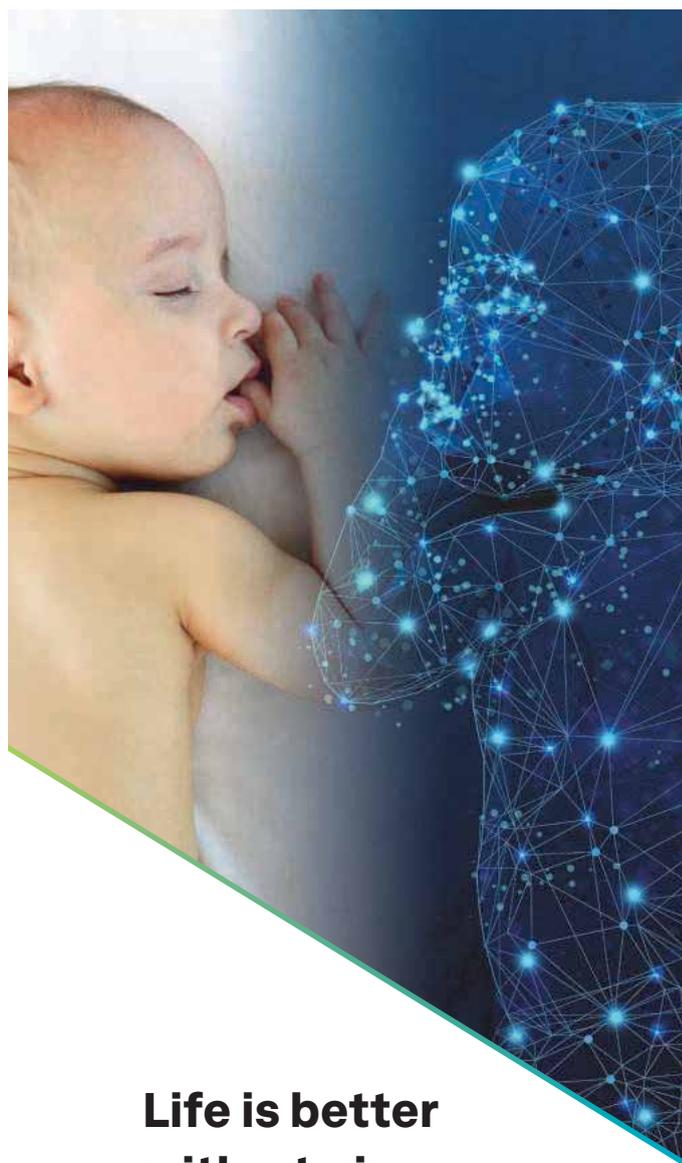
Lantek is a multinational that is leading the digital transformation of companies in the sheet metal and metal industry. With its patented smart manufacturing software, it enables factories to be connected, turning them into Smart Factories. It rounds off its range of services with CAD/CAM, MES, and ERP solutions for companies that manufacture metal parts from sheet metal, tubes, and profiles using any cutting technology; laser, plasma, oxycut, waterjet, shearing, and punching.

Founded in 1986 in the Basque Country, Spain, one of the main European hubs of machine tool development, Lantek enables the integration of sheet metal and metal processing technologies using the most advanced manufacturing management software.

The company is currently a leader in its sector thanks to its capacity for innovation and commitment to internationalisation. With more than 21,884 customers in over 100 countries and 20 offices in 14 countries, it has an extensive network of distributors with an international presence. In 2018, its international business contributed to 86 percent of its revenue.

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MacKay Manufacturing reduces lead times with ESPRIT and Tsugami

Combining the power of ESPRIT and Tsugami has proved to be a boon for MacKay Manufacturing, reducing the time the company takes to machine complex parts

Founded in 1986, MacKay Manufacturing is a job shop that produces high-performance machined parts and sub-assemblies, with a focus on aerospace parts, surgical instruments and devices. The company has more than 135 employees at its Spokane, Washington, facility, where it also runs a two-year on-the-job training program to make sure its machinists get the experience they need to take on the company's complicated projects.

At any given time, MacKay has between 400 and 600 work orders in progress. Job quantities can range from a one-off prototype part to several thousand pieces, machined in common metals like aluminum, titanium and stainless steel, as well as more exotic materials like ToughMet and ceramic plastics. The parts MacKay makes are typically complex and made with challenging materials, requiring tight tolerances, special certifications and efficient prototyping. MacKay places a high emphasis on oversight and maintaining robust documentation control and production process tracking, in order to assure customers that it has purchased the correct raw materials and is properly utilising them during each step of the manufacturing process.



MacKay's production department runs 17 mills including 11 horizontal Leblond Makino machining centres with 5-axis capabilities, three vertical Mori Seiki mills and two Willemin-Macodel 408MTs. It also runs 16 lathes and Swiss-style turning machines, including three Tsugami 20 mm Swiss-type screw machines with IEMCA BOSS 325 bar feeders, a Tsugami MU26 and five Tsugami 32 mm Swiss-type turning centres with dual spindles and independent turrets, live tooling and thread whirling options and an LNS Hydrobar feeder. The prototype department has six Mori Seiki vertical mills, two wire EDMs, three Bridgeport mills and three lathes of its own.

To efficiently cut small parts, MacKay purchased its first 20 mm screw-type Tsugami machine in 1998. "We chose Tsugami because they have a reputation for being reliable, durable machines and they've proved that to be true," says MacKay's manufacturing supervisor, Gabe Compton. "We also chose Tsugami because of their excellent customer service and their relationship with the Tsugami/Rem Sales distributor Ellison Technologies, with whom we were already affiliated." Rem Sales is the North American importer of Tsugami machine tools and sells Tsugami machines via national distribution channels and direct sales agents. Tsugami also offered MacKay the opportunity to standardise its machinery, a necessity for a rapidly growing company.

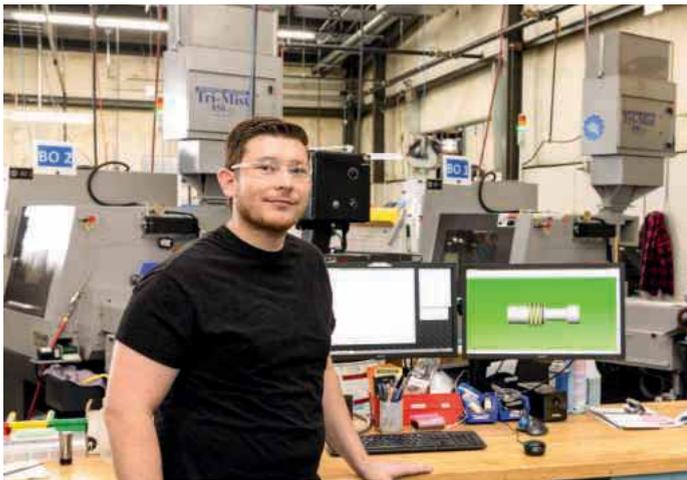
MacKay began using ESPRIT in early 2010 on a Mori Seiki machine and now runs five seats of the CAM system to generate code for multiple machines, including the Tsugami lathes.

"ESPRIT solved an issue common to many shops: how can we get a better, more efficient program to the production floor and do it before the job is ready to start?" says Gabe Compton. "We are now able to preprogram the parts before they are scheduled to go into the machine. This has proved to be far more productive than programming the job at the machine, which takes up valuable time that could be used to manufacture parts. Now we have the tools staged and setup sheets created before the



job is scheduled to run. We just have to load the code, set the tools and go go."

The pairing of ESPRIT and Tsugami has been beneficial for MacKay. "The Tsugami lathes allow us to meet the requirements for increased parts production. Their relative ease-of-use and durability have given us the ability to meet growing demand," Gabe Compton explains. "At the same time, we've been able to use ESPRIT to reduce the time spent programming at the machines. This helps us reduce our lead times for customers."



For example, MacKay makes a small L-tip part for a device used in endoscopic surgeries. MacKay initially ran the part as a lathe blank, meaning that it would run all of the round features and then send the part to the milling department to cut the "L" shape. The lathe blank ran for a minute and a half on the Tsugami BS20 and then for an additional five minutes on a mill. In the years since taking on the project, the company has brought on new cutting tool technology and speeder heads; combined with an increasing knowledge of what is possible on the Tsugami BO326-II and within ESPRIT, MacKay felt confident enough last year to take on the challenge of making the part using only a BO326-II.

Gabe Compton says: "We can now machine this part in three minutes and make a far better part than we had previously. We have since taken on two other parts in this part family and make them entirely on the lathe as well. We couldn't have done this without ESPRIT and their technical support, nor could we have done this without the capability of the Tsugami lathe."

As MacKay looks to the future, the focus is on growth and meeting customer needs on time, while maintaining the highest quality in the industry. "Being a job shop and having the capability and certifications to make just about anything for anyone, the future seems bright for us here at MacKay," Gabe Compton concludes.

ESPRIT is a highly adaptable CAM system that's used across industries and continents to create nearly anything, but especially complex parts. It's not just about software, though. Its robust technical support offers users a true long-term partnership and ensures they're getting the most out of ESPRIT.

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Latest VISI improves progressive die design

Deburring, reverse and graphics enhancements to mould and die software

Progressive die design

Upgrades to the new part unfolding technology provide the ability to work directly on the original solid model, supports blanking functionality and manages parts with non-linear bends.

The sheet metal part recognition provides an improved graphical representation of the part, analysed by identifying bends, planar faces and features. Different face types can be set, to be considered for the blanking process. The new technology allows linear blank unfolding and flange unfolding to be combined into a single functionality. With linear bends, the system will unfold using the linear bend unfolding technology, while flange areas unfold using the FEA unfolding solution. Coining faces can also be unfolded as part of the same process.

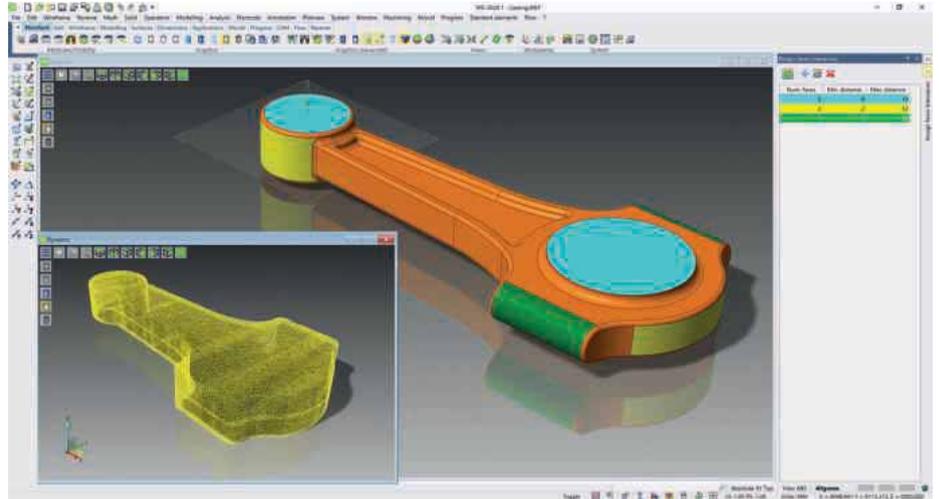
VISI product manager Marco Cafasso says the major advantage of the new technology is the associativity provided with the original model during the die design process: "It allows the original part to be modified and changes to be automatically propagated on the blanked part. This new feature allows all the linked parts to be rebuilt in reference to a modification done to the original part. This is extremely useful because it updates all the studied parts in a single click and is a major time saving in the design and modification phase of a progressive die."

VISI 2020.1 also provides a direct interface to Stampack Xpress, for die simulation.

Enhanced reverse and casting

The Reverse module has been enhanced with additional functionalities for both Reverse and Casting processes, including new features to support the scanning to surfaces generation.

Marco Cafasso says features such as radius generation from mesh, plane generation, adapt mesh on boundary, and sectional curves on mesh, provide greater benefit for the reverse process from point scanning to solid model generation: "A new Best Fit feature aligns a stock model to the final solid model by setting tolerances on different faces. This is extremely useful for the casting market, as it allows the cast model to be scanned, achieving a best fit alignment with the final geometry,



producing an optimised toolpath with reduced machining time." The stock model can then also be used for machining simulation purposes.

The Compare feature has been improved to provide an enhanced graphical evaluation of the results, and to display distances between the scanned model and the final solid model. Marco Cafasso adds: "The enhancements achieved provide quality improvements to both processes as well as time saving from the scanning to the manufacturing process."

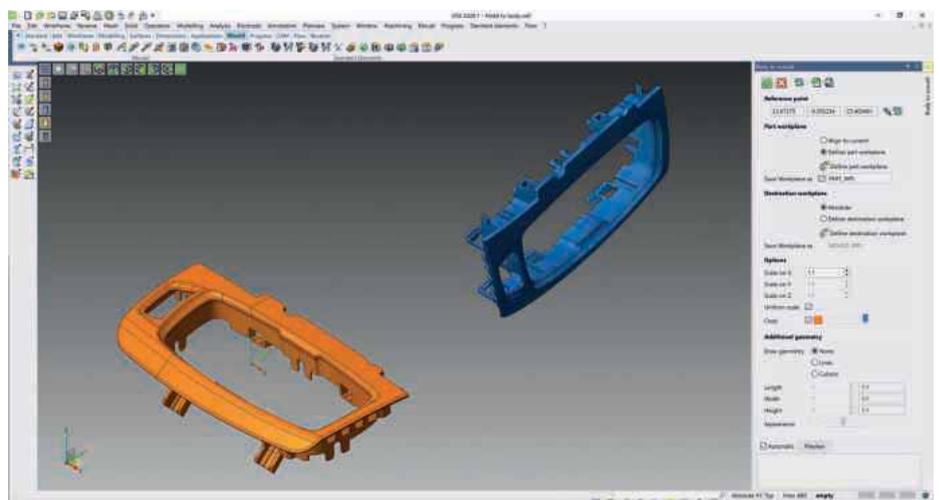
Mould tool design

A new body to mould functionality has been introduced, which provides a quick solution to define the correct position and orientation of a plastic part on the tool. The feature allows the transformation of the

model from the "car in line" position to the mould position and to apply the required shrinkage value. "The original position of the model can also be restored if modifications are required for the moulding of the part. This is extremely useful especially, but not only, for the automotive market, as it provides a time saving for the mould design process," explains Marc Cafasso.

5-axis deburring

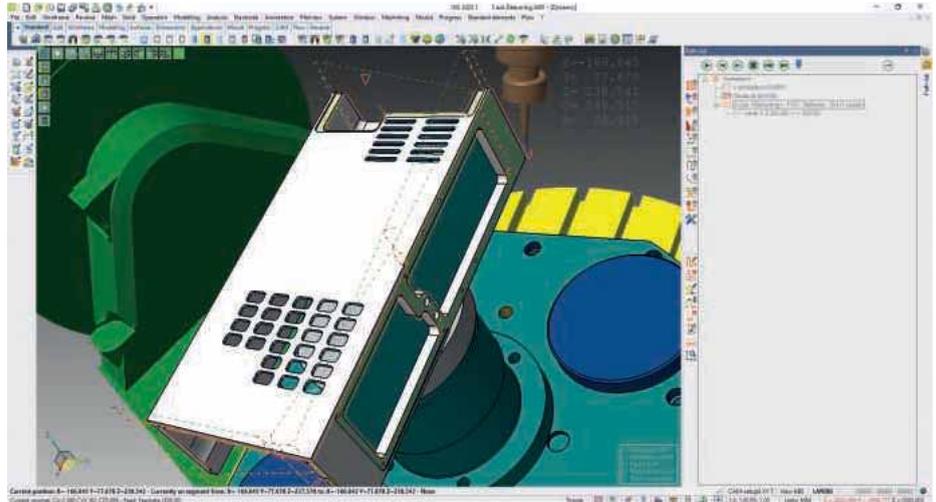
Marco Cafasso says a new automatic deburring function reduces the setup time for that vital aspect of the overall process: "Creating CAM operations on any arbitrary part geometry is relatively easy nowadays, as parts can be virtually designed, created and produced. However, once CAM is finished there is one last operation that is



not yet automated and is usually done manually after machining. Burrs occur on all parts that have straight edges or non-tangent outer surface topologies. They appear when the tool is chipping the metal off that edge. It's an unwanted situation because it can destroy the functionality of the part and can even be a danger to the worker as it's razor sharp. So, most of the time it's essential to remove it."

The purpose of VISI's deburring strategy is to provide an automatic finishing to the machined part's sharp edges, an important phase of the manufacturing process for parts with no tangent surfaces. It creates a highly automated tool path to deburr sharp edge of a workpiece with a spherical tool. The tool is positioned in the bi vector of the automatically detected sharp edges. Automatic tilting and linking is then applied to avoid collisions. Marco Cafasso continues: "As the whole process is highly automated, this machining strategy significantly reduces deburring setup time."

Additionally, the 5-axis Autotilting capability has been enhanced in VISI 2020.1, with new smoothing options, based on a more sophisticated interpolation algorithm. This optimises the contour while keeping



the tilt angles in a limited range; resulting in a more fluent movement of the machine while milling the part.

Enhanced graphics

New graphical representations assist in validating the model for manufacturing purposes. The Undercut and Accessibility shading also identifies undercut areas during the design and modelling phases. "The advantage provided is the ability to validate a model for manufacturing

purposes at an early stage in the design to manufacturing process," concludes Marco Cafasso.

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Latest hyperMILL release on show at MACH

High-precision and high-performance milling and turning are two natural topics that visitors to the OPEN MIND booth can expect to see at MACH. However, at this year's event, the leading CAD/CAM vendor will also provide manufacturers an opportunity to witness the unparalleled steps that hyperMILL® has taken with its latest release, Version 2020.1.

The latest hyperMILL 2020.1 release introduces a raft of new features that include significant enhancements to everything from Slot-Rib Probing, 3D Optimised Roughing, 3D Profile Finishing, 3D and 5-axis Corner Rest Machining, 5-axis Blade Tangent Milling, ADDITIVE Manufacturing and Automatic Contour Feature Splitting. In addition to this, OPEN MIND has incorporated further improvements to the Settings Wizard, Toolpath Display, 5-axis Tube Finishing and 5-axis Contouring functions with more feature enhancements also incorporated into the hyperCAD-S® CAD platform.

The major new features in the latest hyperMILL 2020.1 release arrive from the NC code-based hyperMILL VIRTUAL Machining simulation solution, the Digital Twin concept and the hyperMILL AUTOMATION Centre.

Creating a perfect fusion between the virtual and real world, hyperMILL VIRTUAL Machining creates a virtual representation of the actual machine tool.

Virtual world with real-world benefits

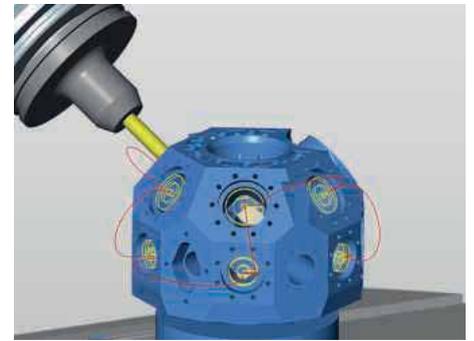
In the modern manufacturing environment, the ability to create a virtual representation

or 'Digital Twin' of a machine tool is becoming increasingly important. Recognised as the only way to create simulations true to reality, hyperMILL VIRTUAL Machining makes it possible to design a significantly more efficient and safer set up. The confidence this instils in customers, especially when undertaking particularly complex work, is truly invaluable.

hyperMILL VIRTUAL machining consists of three modules. In the 'Centre', which is the simulation solution. The machine, the controller and PLC are represented virtually and simulated based on the NC code for maximum safety.

During the postprocessor run, the 'Optimizer' automatically selects the best solution for collision-free orientation. In Version 2020.1, the Optimizer has been enhanced, so the automatic solution selection and calculation time during post-processor have been improved. This significantly reduces auxiliary processing times. The new 'Smooth linking' function automatically optimises all linking movements between the individual operations during the postprocessor run. This ensures that repositioning and movement is always in close proximity to the workpiece and checked for collisions.

Subsequently the 'CONNECTED Machining' feature enables bi-directional networking with the machine so that parameters can be compared against the CAM programme and the machine can also be controlled remotely.



hyperMILL adds-up with enhanced AM features

Also reaching prominence in the modern manufacturing arena is Additive Manufacturing (AM) and OPEN MIND is geared-up for this with the latest hyperMILL AM updates in Version 2020.1.

hyperMILL AM allows manufacturers to perfectly control both additive and subtractive processes. For Powder Bed Fusion (PBF) OPEN MIND optimally integrates into the process chain to post-process printed parts. hyperMILL AM actively controls the material application of the Directed Energy Deposition (DED) process to ensure optimal results.

In hybrid manufacturing processes that combine additive and subtractive manufacturing, hyperMILL enables users to perfectly program additive layering and subtractive milling together. The unique 5-axis technology from OPEN MIND is ideal for simultaneously controlling 5-axis material deposition and thereby achieving optimal results. hyperMILL AM is the perfect partner for your additive manufacturing needs.

For further information on the latest hyperMILL 2020.1 release and the updates to the hyperMILL VIRTUAL Machining, hyperMILL AUTOMATION Centre and the hyperMILL AM modules, please visit the OPEN MIND Technologies Stand at MACH.

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

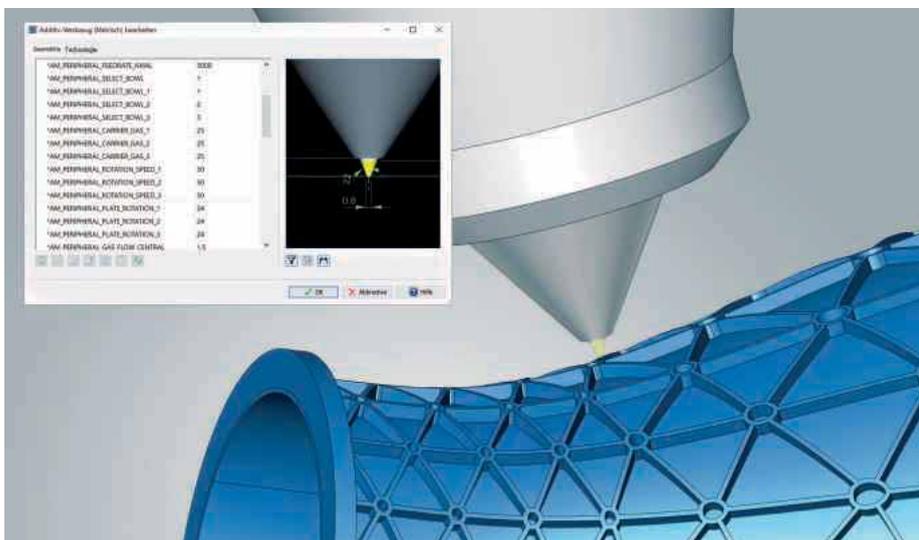
OPEN MIND Technologies UK Ltd

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MACH Stand: 17-440



Authentic effects and realistic graphics bring machines to life

ModuleWorks has announced the release of Visual Twin, its next generation of machining visualisation technology. Visual Twin combines the proven ModuleWorks simulation components with state-of-the-art computer graphics to achieve a new level of realism that brings machines to life.

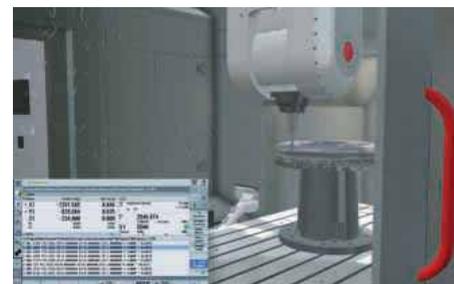
Realistic graphics with lighting, shadows, textures and flying chips, as well as high-quality audio, deliver an authentic and immersive experience that takes real-time simulation beyond mere technical functionality and turns it into a powerful business tool. With Visual Twin, sales teams can deliver impressive and convincing demonstrations of a customer's specific machining process. As part of a company's marketing strategy, Visual Twin is a cost-effective alternative to shipping large, heavy machines to trade fairs and exhibitions. It is also a valuable training tool, enabling operators to learn and practice in a realistic environment without expensive downtime, waste material or the risk of collisions.

Built upon the proven ModuleWorks

simulation technology, the high-performance Visual Twin runs on consumer grade hardware and connects to CNC controls for fully integrated and realistic real-time simulation on the shop floor.

ModuleWorks is a software component provider for the digital factory industry. ModuleWorks' expertise in simulation technology is recognised throughout the CNC and CAD/CAM industry and its software components and development services are used by renowned OEMs in the digital factory industry as well as the majority of the leading CAM vendors. From standard products to exclusive development projects, it works in close cooperation with you to optimise your digital factory solutions, increase your competitiveness and to help you get there faster.

The company was founded by Yavuz Murtezaoglu in 2003 as a specialist software company and as an independent CAD/CAM component supplier offering industry proven 5-axis machining software. This was



the springboard for the ModuleWorks success story and it soon established a strong reputation for delivering cutting-edge CAD/CAM solutions.

ModuleWorks started with a small number of industry partners, but the strength of the technology and increasing worldwide demand for 5-axis machining meant rapid growth and it soon had many additional partners and a rapidly expanding product base.

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Solutions from Tebis at MACH

At MACH, Tebis UK will be presenting release 8 of its CAD/CAM Version 4.0 and ProLeiS MES Version 4.0. Both software solutions will be available for live viewing throughout the duration of the show.

Visitors to the exhibition are encouraged to talk to Tebis about its CAD/CAM and MES solutions, which offer leading advanced technologies for manufacturing process standardisation, automation and shop floor equipment as well as resources monitoring, production planning and control.

The company's exclusive knowledge-based machining technology supports database libraries of machine tools, cutting tools with machining parameters, machining features, CNC toolpath templates and machining process templates. This allows customers' best machining practices to be built into Tebis database and shared among CAM engineers, which reduces the work pressure on CAM engineers while ensuring the best results.

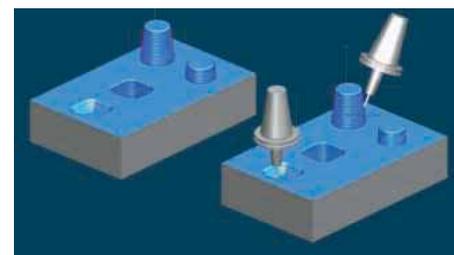
The Tebis unique Virtual Machine

technology supports machining setup and planning, collision-free CNC toolpath calculation, simulation and verification. This is especially beneficial to customers for 2.5D to 5-axis milling, trimming, laser cutting, mill-turn as well as robotic machining.

Tebis CAD/CAM software lets you design 3D CAD models in a wide range of manufacturing areas and calculate NC programs for your NC-controlled manufacturing. It supports machining, laser and EDM technologies.

ProLeiS MES software enables users to ensure that all components are completed on time and that their products are delivered on schedule. It enables real-time monitoring and ad hoc evaluation of important production parameters like machine run times and errors in the production process. Depending on your CAD/CAM process, you can extend your installation as needed for special design and manufacturing tasks.

Tebis is a privately-owned company headquartered in Planegg near Munich,



Germany, with locations in 17 countries. Its 400 employees around the world support customers in the automotive, aerospace and industrial industries. For 35 years, it has delivered process efficiency and technological advantages to die, mould, machine and aerospace manufacturers worldwide. Its business is conducted responsibly and follows clear principles that are entirely in the best interest of customers.

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MACH Stand: 17-340

First UK installation of AMADA ENSIS with Rotary Index

Carrickfergus-based NIJEN Stainless Fabrications has made its first venture into laser cutting by investing in a new AMADA ENSIS-3015AJ fibre 3 kW with Rotary Index, the first machine of its type in the UK and Ireland marketplace. Up until this point, all AMADA Rotary Index laser cutting machines had been limited to CO₂ cutting and so the advancement to fibre took the processing possibilities to the next level. The investment is described as a “huge leap” for the company that “provides the potential for significant growth”.

Celebrating its 20th anniversary in 2019, family owned NIJEN has grown to become one of leading stainless-steel manufacturers and fabricators in Northern Ireland and rest of UK. The company operates from a 6,000 ft² factory which is home to a dedicated team of highly trained staff and technicians.

NIJEN supplies its fabrication and machining services and stainless-steel products to a range of sectors across the UK and Ireland, predominantly transport and food, but also pharmaceutical, cold storage, medical, energy, architecture and art, to list but a few. In addition, the company can offer a range of its own products, including bollards, cycle racks, street furniture, signage and handrails, for example.

Such a repertoire allows NIJEN to enjoy year-on-year growth. In order to ensure it continues competing at the front end of the market, the company regularly reviews its manufacturing capabilities, with cutting processes among the latest to come under the spotlight.

“We’ve never been afraid to invest,”

states Nigel Cathcart, director at NIJEN.

“For us, the latest technology and ensuring we keep pace with the market has always been a very important aspect of the business. With regard to our cutting processes, we were previously outsourcing our laser profiling requirements, and working in-house with punching, guillotine and corner notching machines. As such, there was a clear opportunity to save on subcontracting, and improve productivity and process control, by investing in stainless steel laser cutting technology.”

A trip to an AMADA UK exhibition in Kidderminster duly revealed the potential available to NIJEN.

“Seeing the ENSIS fibre laser with Rotary Index unit highlighted the flexibility we could achieve,” says Nigel Cathcart. “It was clear to see that the ENSIS-RI was all-encompassing in what it could do.”

Utilising all the benefits of the ENSIS-AJ 3 kW fibre laser for flat-sheet profiling, the Rotary Index unit adds the capability to process tube, channel and angle profiles. With a fast changeover between flat sheet and tubes, and many new functions to decrease set-up and increase efficiency, the ENSIS-RI provides the perfect platform to expand business opportunities.

“We did look at machines from other suppliers because we wanted to make sure that our decision was the right one,” says Nigel Cathcart. “From a technology point of view, the ENSIS-RI answered all of our questions. We’re not afraid of new technology, and AMADA is very strong in this regard.”

The ENSIS-RI has been extremely busy

ever since it was installed in June 2019, with a second shift coming on stream and NIJEN already thinking about a potential third shift.

“We’re receiving more and more enquiries about what we can achieve on the machine, from both existing and new customers,” continues Nigel Cathcart. “In the next few weeks we will also bring in a design engineer, who will help leverage the benefits of the machine to create new products and new revenue streams.”

In terms of sheet profiling, around 90 percent of capacity at NIJEN is used to process stainless steel up to 15 mm thick, and 10 percent for cutting aluminium up to 12 mm. For tube processing, the company cuts material up to 154 mm diameter, in 6 mm wall thickness. NIJEN makes full use of both shuttle tables, as well as the RI unit. Typical batch sizes are 80-150, although sometimes up to 500.

“A lot of our tube work requires piercing, special joint creation and cutting to length, much of which would have been completed on a conventional milling machine previously,” explains Nigel Cathcart. “The ENSIS has blown that process out of the water with the speed it can cut. In particular, the Rotary Index is proving a big plus in terms of cost and time savings. Also, the accuracy that we can achieve is very similar to that of a CNC milling machine, as is the quality of cut.”

The introduction of the ENSIS-RI has saved the previous cost of outsourcing the company’s laser cutting and waterjet requirements. Also, in terms of time savings, NIJEN can now turn jobs around a lot faster, particularly as there is no transportation



involved. Work that previously took a few days at a subcontractor, can now be completed internally within a few hours. Production control is also enhanced as a result of bringing the process in-house.

To complement the ENSIS-RI, NIJEN has taken delivery of a pre-owned, fully refurbished AMADA HFE-1003M2 7-axis long-stroke press brake.

"The thinking here was centred on achieving even higher levels of repeatability and precision," says Nigel Cathcart. "We had two press brakes, but they were in need of an upgrade, hence the investment."

He admits there was a little bit of apprehension among shop-floor personnel with regard to the arrival of the AMADA machines, but this was short lived once the improvement in performance could be seen first-hand.

In fact, integration of the machines was aided by investment in various AMADA software solutions, including V-factory, which provides real-time data from any AMADA machine anytime, anywhere, using any device with an internet connection. Parameters monitored by V-factory extend from current machine status and volume of

work, through to material usage, energy consumption and operation analysis. As Nigel Cathcart points out, V-factory "tells us everything and more". Moving forward, NIJEN anticipates that V-factory will handshake with a soon-to-be-installed MRP system, helping to shape a digital future for the company.

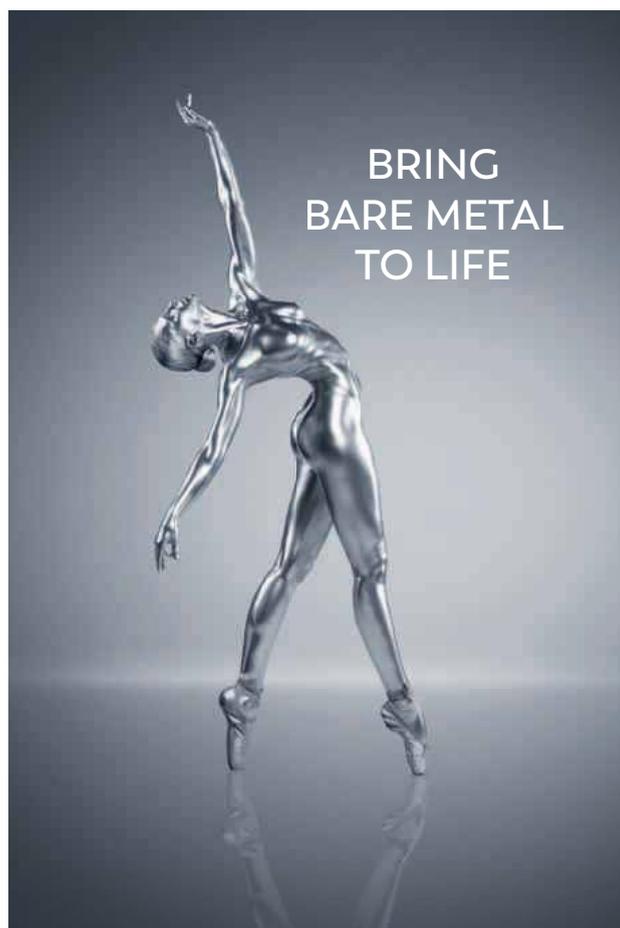
NIJEN has also installed AMADA's VPSS 3i Blank & Tube automatic programming and nesting software, as well as AMADA SheetWorks 3D CAD.

"All of this investment has been prompted by a significant rise in the number of enquiries being received, in particular regarding component variety," concludes Nigel Cathcart. "The AMADA machines and software have effectively taken care of the additional skills we would've needed to meet these customer requirements. One of our major market differentiators is that we always make an effort to discover exactly



what the customer wants. Having the AMADA technology in place means we can offer so many more solutions than previously. Even though we are a relatively small company, this investment shows that we are agile, nimble and have a huge amount of courage."

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LASER

Get wrapped up in textiles with laser cutting

by Alex White, managing director, Blackman & White

Textile printing is in the ascendant, thanks to developments in digital ink technology and a growing customer interest in new textures, unique designs and more environmentally friendly materials. From sports apparel to soft signage to sailcloth, there are a host of opportunities in textiles to explore.

As digital textile printing technology has evolved, so have cutting systems; there's little point in investing in the latest printer if it creates a bottleneck in the finishing department. Laser cutting offers a wealth of benefits for businesses adding textiles to their service offering, chiefly the technology's versatility. Blackman & White built on unparalleled decades of cutting experience to become the first in the industry to add a laser conveyor cutter specifically for textiles, expanding the technology's application potential, which already delivers cutting, creasing and routing of common materials such as vinyl, banner, foam board, Correx, Perspex and Dibond to offer compatibility with a myriad of fabric and technical textiles. The laser is also modular, meaning other tools can be used on the same system, such as a router, driven wheel and electric oscillating knife, to name a few. This enables both scalability and material cutting flexibility.

In short, an investment in a single machine with laser cutting capabilities could accelerate everyday production while future-proofing for entry into new markets, while ticking all the boxes demanded by modern designers and manufacturers: fast processing and production rates, high levels of reliability and minimal maintenance requirements, and an excellent quality finish.

It is this easily achievable high-end finish that makes laser cutting particularly compatible with textiles. It achieves snag-free, sealed edges on a wide range of fabrics, notably synthetics like nylon and polyester, and natural materials including leather, cotton and silk. It can leave a sharp finish, even on the most intricate shapes, allowing creative

designs on, for instance, backlit displays. Adding lighting effects can produce incredibly effective finishes, or 3D-effect displays created by layering cut fabric. Laser finishing leaves no obvious discolouration on dark-coloured textiles, and on light colours this can be minimised by altering the laser power, air pressure and cut speed, all easily done during operation, for seriously impressive output.

In addition to aesthetics, laser cutting offers safety and user-friendly benefits over other cutting methods, thanks to its contactless operation. Rotary wheel cutting may incur accidental lifting or moving of the material, and potentially threads wrapping around the wheels, issues that are removed by laser cutting. Also, some fabrics, such as a flag material, can be cut as fast or faster than using a rotary wheel, with no fraying edges. While hot knife cutting can achieve the same quality of sealed edges, this technology can be a time-consuming additional process that, owing to its contact with the material, can stretch and distort the fabrics, and create hazardous fumes. Additionally, the contact-free nature of laser cutting means the structure of the fabric is irrelevant; it can be processed in any direction - and there is reduced dust production and no tool wear.

Laser cutting is a clean, precise technology ideally suited to textiles, while

also offering functionality on a variety of other substrates. With the added reliability, efficiency and user-friendliness of digital operation, it can open exciting doors across many markets.

Founded in 1964 with technology and innovation firmly at its core, Blackman & White delivers cutting-edge solutions used by a wide range of companies, from global manufacturers to start-ups.

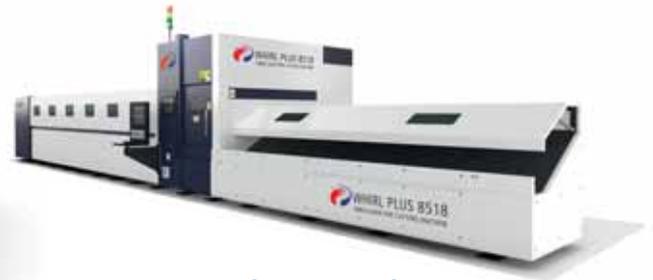
Blackman & White is the UK's only manufacturer of cutting systems, with all machines designed and manufactured from start to finish at the company's UK factory in Maldon, Essex. With years of engineering experience, Blackman & White machines are easily identified for their robust and reliable build quality, as well as their flexibility of holding multiple combinations of knife, laser and marking tools. This flexibility goes hand in hand with Blackman & White's record for quickly delivering a return on investment for customers in a wide variety of sectors including marine, composites, textiles and digital print applications.

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MultiWave Hybrid Technology - the clean cut solution for composites

Carbon fibre composite materials are finding their way into an ever-increasing number of products and applications. The aerospace and motorsport sectors were amongst the first to take advantage of the high-performance strength to weight ratio of these materials and today they have become an essential and integral part of many components in other sectors such as defence, automotive, marine, power generation and consumer products.

The strength and durability of these materials, however, does pose significant challenges when it comes to cutting and machining them. Conventional machining methods and cutting tools generally perform poorly on composite materials, suffering from excessive tool wear and exerting significant stresses on the material, which can cause high levels of de-lamination of the part.

Lasers are increasingly being used for machining and cutting operations on Carbon Fibre Reinforced Polymer (CFRP) Composites. In this article, TLM Laser's Andy Toms discusses how using multiple wavelengths can help overcome the issues associated with cutting CFRP's, and create a clean laser cut edge with minimal heat affected zone:

Stresses induced when cutting and machining composite materials, using traditional mechanical machining methods, can result in displacement of the fibres and, in severe cases, delamination of individual layers. This in turn leads to significant degradation of the structural properties of the CFRP composite.

Laser cutting, as a non-contact process, does not cause the edge damage that is characteristic of mechanical cutting processes. However conventional laser cutting can potentially still create excessive heating near the cut edge. For example, a 1.06 µm wavelength Yb-doped fibre laser can cut through a CFRP composite, but the resultant cut is not optimised due to the fact that the polymer matrix material is largely transparent to this wavelength.

In this scenario, the carbon fibres absorb the 1.06 µm laser energy, converting it to heat. The heat vaporises the carbon fibres cleanly, but residual heat is conducted down

the length of the fibres causing decomposition of the polymer matrix material and leaving a large heat affected zone (HAZ). Alternatively, a CO₂ laser, with a characteristic wavelength of 10.6 µm, can also cut through a CFRP composite. Both the carbon fibres and the polymer matrix material will readily absorb the 10.6 µm laser energy. However, the amount of energy needed to vaporise the carbon fibres is usually much greater than the energy needed to vaporise the polymer. This again leads to excessive decomposition of the polymer matrix material in the vicinity of the cut edge.

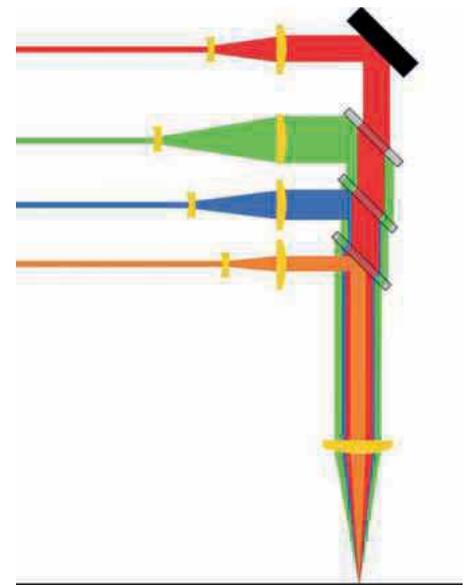
A unique solution to this issue can be found by combining two laser wavelengths into a single, coaxial laser beam. The hybrid laser beam is composed of a CO₂ laser beam with a wavelength of 10.6 µm and an Yb-doped fibre laser beam with a wavelength of 1.06 µm. The 10.6 µm laser wavelength cleanly ablates the polymer matrix material, while the 1.06 µm laser wavelength simultaneously cuts the carbon fibres. This leads to a superior cut quality with minimal heat affected zone (HAZ) and, more importantly, no delamination.



Universal Laser's ULTRA X6000 Platform uses MultiWave Hybrid Technology to combine different laser wavelengths into a single coaxial beam

This multiple wavelength concept has been tested and proven through trials undertaken by Universal Laser Systems Inc. All laser processing was performed using a 40 W Yb-doped fibre laser with a wavelength of 1.06 µm, and a 75 W CO₂ laser with a wavelength of 10.6 µm.

Universal Laser's MultiWave Hybrid Technology™ allows the individual laser beams to be combined into a coaxial beam with a common focal plane. The laser beams can also be operated independently if required. Multiple wavelength laser cutting was tested on 1.5 mm thick carbon fibre reinforced polymer sheet stock, with the laser cutting process optimised to provide the best balance between 1.06 µm laser energy and 10.6 µm laser energy. Cut quality was observed microscopically using an Opto-digital microscope.



Schematic representation of MultiWave Hybrid Technology optics system, which allows laser beams of differing wavelengths, indicated by colours, to be combined into a single, coaxial beam



CFRP sheet cut with CO₂ laser: left hand circle Yb-doped fibre laser, middle circle and a multiple wavelength laser beam right hand circle

A comparison was made between cutting the CFRP sheet with a CO₂ laser, a Yb-doped fibre laser and subsequently a multiple wavelength laser beam. The circle

on the left of the image is the result obtained using only the CO₂ laser. The 10.6 μm wavelength of the CO₂ laser was absorbed efficiently by the polymer matrix material, causing it to decompose and vaporise. However, it was not possible to cut through the carbon fibres due to their relatively high vaporisation threshold. It should be noted however, that it is possible to cut through carbon fibres with a 10.6 μm wavelength laser beam, but it requires significantly more power than the 75 W used in this specific analysis.

The middle circle in the image above was cut using only the 1.06 μm wavelength Yb-doped fibre laser. This wavelength is absorbed efficiently by the carbon fibre; however, the polymer matrix material is transparent to this wavelength. The result is that the carbon fibres that are directly in the path of the laser beam are vaporised efficiently. The matrix material is vaporised indirectly, through conduction of heat down the carbon fibres. This leads to significant degradation of the polymer matrix material near the cut edge, as shown here. The exposed carbon fibres shown in the figure can lead to delamination and degradation of mechanical properties.



Left image: Microscopic image of the cut made using only the Yb-doped fibre laser showing significant loss of polymer matrix material and exposed carbon fibres

Right image: Microscopic image of the cut made using the 1.06 μm laser beam and the 10.6 μm laser beam simultaneously

The right-hand circle was cut using both lasers simultaneously. The benefit of this approach is that the carbon fibres are heated and vaporised directly by the 1.06 μm laser beam, while the polymer matrix material is heated and vaporised directly by the 10.6 μm laser beam. This minimises overheating of the polymer matrix material and, as this image shows, creates a much better cut quality through the use of the multiple wavelength laser beam. The heat-affected zone (HAZ) is also significantly reduced.

Using the two laser beams simultaneously

results in an efficient process for cutting CFRP. Each of the two laser beam wavelengths was selected to heat and vaporise the individual components of the composite sheet. By using this multiple wavelength laser cutting technology, the CFRP can be cut cleanly using relatively low power lasers. This technology can be extended beyond CFRP to other types of composite sheets through appropriate selection of the laser wavelengths.

A wide range of Universal Laser System platforms and MultiWave Hybrid Technology is available from Bromsgrove-based TLM Laser, the UK and Ireland distributor for Universal Laser's cutting and marking systems. In addition, the company also offers a comprehensive range of laser processing systems for cutting, welding, marking, engraving, cleaning, 3D additive layer manufacturing, plus laser safety equipment.

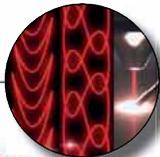
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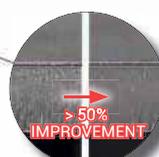


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Team FC delivers on customers' demands

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FC Laser, the fastest growing precision laser cutting company in the UK, has made a further addition to the FC team; the LT7 fiber lasertube is the most complete and advanced lasertube available in the market today.

Virtually any shape can be machined on to both ends of a tube and along its length.

Entire traditional machining operations can now be laser cut, removing from the manufacturing process sawing, deburring, punching, notching, drilling and milling. Eliminating these multiple, traditional machining operations prevents potential accumulative errors associated with consecutive manufacturing processes plus all the associated handling and touch-time costs.

One of the key benefits of laser cutting tube is the savings users receive in direct labour and reductions in cycle times, with 70 percent process time savings not uncommon.

Also, the freedom from the restrictions of traditional machining processes allows new levels of creativity and innovation which can revolutionise all aspects of production, from design, manufacture through to final assembly.

By providing a high technology but cost-effective solution, the LT7 fiber



lasertube simplifies production planning and job routing. Due to its inherent accuracy it produces genuine production benefits in simplifying or eliminating welding jigs or even the welding process all together. The LT7 fiber lasertube requires no hard tooling and, if STEP files are provided, programming to cutting takes only a few

minutes. This creates instant benefits when producing prototypes or making design enhancements, as costs and delivery timescales are reduced.

The LT7 allows automatic tube changes whilst achieving maximum accuracy, adapting the cutting head to the real working conditions of the tube quality.



FC Laser - specialists in fibre laser tube cutting

Quality is the most important factor at FC Laser. The focus is to ensure delivery of a solution that meets customers' needs. This covers quick and on time deliveries, technical support to help reduce or even eliminate additional machining and welding processes and dedicated account management to ensure their requirements are always achieved.

Some of the key features and benefits of the FC Laser facility include:

• **Fibre technology** that offers the most productive and cost effective laser cutting solution compared to CO₂

• **Active Scan** compensates for potential errors induced by distorted tubes

• **Active Speed** adjusts parameters in real time according to the conditions of the tube creating superior cut quality

• **Active Marking** allows etching of part numbers, ID, order numbers or anything else for traceability

• **Active Weld** detection requires no mechanical adjustment. The LT7 detects weld positions using optical sensors and sets up accordingly.

Once you have experienced and seen the benefits of FC's lasertube solutions you will never go back to traditionally sawn and machined tube production. The LT7 fiber lasertube maximises productivity and accuracy to deliver truly cost-effective solutions.

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Excellence is the **FC** standard

The latest addition to the FC team, the LT7 fiber lasertube is the most complete and advanced lasertube available in the market today. As demanded by our customers' we aim to deliver a 'one stop shop' with the highest levels of attention to detail and service. We provide a high-technology, cost effective solution to traditional machining processes, satisfying demand by revolutionising all aspects of the tube fabricating process from design, manufacture through to final assembly.

Our unique approach utilizing our continuous improvement techniques ensures we deliver the best possible solution. We challenge design to deliver and improve our customers' solutions which adds value and can create savings through efficiencies.

Some of the key features and benefits of the LT7

- ✓ **Fibre technology** offers the most productive and cost effective laser cutting solution compared to CO₂
- ✓ **Active Scan** compensates for potential errors induced by distorted tubes
- ✓ **Active Speed** adjusts parameters in real time according to the conditions of the tube creating superior cut quality
- ✓ **Active Marking** allows etching of part numbers, ID, order numbers or anything else for traceability
- ✓ **Active Weld** detection requires no mechanical adjustment. The LT7 detects weld positions using optical sensors and sets up accordingly.

With all these benefits its easy to see why excellence is the FC standard.

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Subcontractor celebrates 25th birthday with huge investment

€30 million invested in factory expansion, including three-machine fibre laser cutting cell

Sheet metal fabrication and CNC machining subcontractor Inishowen Engineering, which has just celebrated its 25th anniversary, has dramatically increased the size of its production facility in County Donegal. This follows an €11 million investment in a new, 160,000 sq ft factory, which opened on the company's seven-acre site in Dumdries in early 2019.



The 160,000 sq ft factory extension on Inishowen Engineering's seven-acre site in Dumdries

As part of the expansion programme, which started in April 2017, an extra €19 million has been spent on new machine tools, a pair of robotic welding stations, and new finishing equipment including shot blasting booths, wet and powder painting lines and a nano pretreatment and electrophoretic coating facility.

In addition to the replacement of a CNC tube bender and a plasma cutting machine with more modern plant and the purchase of another large machining centre, other new machines on site include a 12 metre by 2 metre capacity, 6 kW, flat-bed fibre laser cutting centre that arrived in 2018. It joined two 4 metre by 2 metre capacity models of similar power installed in 2015 and 2017. All are BySprint Fiber Laser machines manufactured by Bystronic in Switzerland and supplied by Bystronic UK, Coventry.

On site also from the same source are seven press brakes as well as a machine for CO₂ laser cutting tube up to 305 mm diameter by 12,500 mm long. Additionally, during the spring of 2019 Bystronic supplied and installed an automated sheet storage and handling system that continually loads and unloads material to and from the three flat-bed lasers, reducing the manning

requirements on these machines whilst also improving productivity.

Inishowen Engineering's owner and managing director Michael McKinney explains: "Underlying this latest round of investment is our diversification of concentrating mainly on the agricultural, quarrying and mining sectors to supplying firms manufacturing materials handling and transportation equipment, including forklifts and multi-purpose tractors.

"In all of the industries we serve, component parts and assemblies we are asked to produce are becoming larger so that customers can minimise welding when manufacturing their products, hence the need for machines capable of processing 12-metre long sheet and tube."

In the case of the tube laser cutting machine in particular, which was delivered in the second quarter of 2019, he added that this new offering to customers sets the company apart from most subcontractors in Ireland and also in the UK, broadening its capability considerably and preventing work from being lost to competitors with CNC tube processing capacity.

The tube laser can complete in five minutes what might take four hours of

manual milling and drilling on different metal cutting machine tools. Moreover, some components cannot be produced at all by conventional means, so OEMs' design departments now have greater design freedom, knowing that more complex parts can be produced and at an economical price.

Automation eliminates bottleneck

With regard to the Bystronic handling system, which comprises two 10 metre high storage towers with 82 locations for 4m x 2 m sheet, together with loading and unloading equipment for the three fibre lasers, Michael McKinney says that formerly the only reason for the machines being idle was due to material not being fed to them quickly enough.

Now that sheet supply has been automated, it is delivered much faster to the shuttle tables, enabling virtually uninterrupted production. He estimates that output from the two smaller machines is up by 30 to 50 percent. Previously, the subcontractor was perpetually 400 to 500 hours behind with laser cutting but within three weeks of the lasers being supplied with sheet from the Bystronic storage



The Bystronic BySprint fibre laser cutting machine for processing 20 m stock at Inishowen Engineering. The storage towers are in the background

system, the backlog had disappeared. A further advantage of automatic material feeding is that it is now easier to promote rush jobs to the top of the queue.

Fibre vastly more efficient than CO₂

The two smaller fibre laser cutting machines in Drumfries replaced models with 6 kW CO₂ power sources, installed in 2007 and 2010. Michael McKinney advises that the former technology is five times as productive when processing 2 mm mild steel, cutting at 40 m/min. The advantage declines somewhat as sheet thickness increases; up

to 12 mm is regularly cut, but the sheer speed of the fibre machines across all gauges only serves to underline the need for efficient, automated delivery of material to the point of cutting.

Michael McKinney adds "The BySprint Fibers not only cut significantly faster but also cost less to service and run, as there are no optics or need for assist gas and electricity consumption is much lower. Moreover, the greater reliability means that we are confident leaving the machines running unattended overnight."

Press braking requirement increasing

The increasing size of components going through the factory necessitated a press braking cell to bend up to 12 m lengths, hence the installation at the start of 2019 of two Bystronic Xpert 6 m, 650-tonne capacity press brakes. They are positioned side by side so that they can be used individually or in tandem, mirroring an earlier purchase of a pair of 400 tonne/4 m press brakes.

However, half of all profiled sheet that is folded in the factory is less than one metre in length. It was the reason for the purchase in 2015 of an Xpert 40 1 m, 40 tonne capacity press brake that Mr McKinney points out is



Another view of the automated storage system showing the handling arrangement serving the two other fibre laser machines

at least one-third faster at bending smaller components than larger machines.

The extra speed translates into higher productivity and in addition, the machine does not draw as much power, just 7.5 kW instead of typically 30 kW for a big press brake, so electricity bills are lower. The acquisition was so successful in raising the profitability of smaller component production that two years later the folding department added the next larger model in the Xpert range with 1.5 m/80 tonnes capacity

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A carriage automatically conveying a 4 m x 2 m mild steel sheet from one of the storage towers to the 20 m fibre laser. Larger sheets are loaded singly onto the shuttle table







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Automotive specialist installs UK's first TRUMPF TRULASER 1030

A specialist in prototyping and low-volume production for a host of high-end automotive OEM and T1 manufacturers has invested in a new TruLaser 1030 fiber from TRUMPF, the first machine of its type to be installed in the UK. The TruLaser 1030 fiber has enabled ASE Design & Development Ltd to bring in-house its previously outsourced requirements for 2D aluminium and stainless-steel components, which it was not able to cut cost effectively on its ageing CO₂ laser cutter from another supplier.

Based in Leigh-on-Sea in Essex, ASE Design & Development Ltd was formed in 2001, since when it has built a solid reputation based on quality, reliability, flexibility and short lead-time deliveries. The company provides a professional, friendly service and is proud to supply OEM and tier-one automotive customers. For more information visit www.asedesign.com.

"Our previous CO₂ laser was getting older, more inefficient and slower," states director Andrew Easter. "Such was its performance that we were sending our 2D aluminium and stainless-steel parts to third-party subcontractors."

Frustrated with the situation, the company decided to research the market for a suitable alternative. As ASE already had a TruLaser Cell 3000 3D laser cutter, which had been highly successful at producing a host of 5-axis components since its installation in 2017, TRUMPF proved the supplier of preference.

"We did look at a new flat-bed laser from our previous supplier, but the TRUMPF TruLaser 1030 fiber was clearly the better machine," says Andrew Easter. "In our opinion, TRUMPF technology is the best in the market."

The TRUMPF TruLaser 1030 fiber was installed in early 2019 and since then it has been "as good as gold". Offering 3 kW of power output via its TruDisk 3001 solid-state laser, the entry-level machine has a working area of 3,000 x 1,500 mm and a maximum sheet thickness cutting capacity of 20 mm mild steel, 15 mm stainless steel, 15 mm aluminium, 6 mm copper and 6 mm brass.

Work at ASE typically falls within the 0.5 to 4 mm thickness range, usually from aluminium, stainless steel and mild steel.



Grilles, bracketry and pressings are among the common types of components produced, prototypes and low volume production.

"Since installing the TRUMPF TruLaser 1030 fiber we have stopped putting our laser cutting out to subcontractors, which is a significant saving," explains Andrew Easter. "What's more, we are making major savings against our previous machine in terms of running costs, as we operate with compressed air as the assist gas where possible, particularly when cutting aluminium."

In addition to profiling with oxygen and nitrogen, users of TruLaser 1030 fiber machines can use compressed air as the cutting gas. This application is possible up to a sheet thickness of 3 mm, depending on laser output and material type. Benefits include reduced cutting gas costs with a more cost-effective alternative, and greater process flexibility thanks to the availability of an additional cutting gas.

Although priced within the reach of virtually all small subcontract fabricators, the TruLaser 1030 fiber relies on the same build quality synonymous with all TRUMPF machines. For instance, the TruDisk solid-state laser impresses with its robust design and power that will last for years. The machine also makes the cut with its easy-to-learn operation, as well as numerous intelligent functions. Additionally, thanks to

its convenient interfaces, laser cutters of the TruLaser 1000 series are easy to automate or connect to other machines.

"We've made real gains with the TruLaser 1030 fiber," states Andrew Easter. "In fact, what we're saving a month on subcontracting and running costs, is probably equivalent to what we're paying for the machine, essentially making it a cost-neutral investment. Moreover, our cut quality is better and we have far more control over our lead times as the process is now in-house."

Quality is a clear focus area at ASE, which is accredited to ISO9001:2015 and has invested in a host of metrology innovations, including laser scanning.

"Our quality is certainly a major reason why customers return time and time again," concludes Andrew Easter. "In addition, we don't miss deadlines, which is vital in a sector such as automotive. With regard to both quality and lead times, investment in the latest manufacturing technologies, such as the TRUMPF TruLaser 1030 fiber, is definitely one of the keys to our ongoing success."

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SPI Lasers celebrates 20 years of innovation

In 2020, SPI Lasers, the UK-based designer and manufacturer of fibre lasers will be celebrating its 20th year, marking two decades of innovation and growth; cementing its position as one of the world's longest established fibre laser manufacturers.

Back in 2000, Southampton Photonics Inc, as it was originally known, was founded as a spin out company from Southampton University's Optoelectronics Research Centre, initially specialising in fibre optical components for the telecommunications industry, but going on to develop both pulsed and CW fibre lasers under the redENERGY and redPOWER brands, lasers that now enable a significant element of industrial manufacturing around the globe.

Over the last 20 years, the 50,000+ laser units deployed by SPI have been heavily involved in producing a myriad of everyday devices from some of the world's leading brands, all based on lasers manufactured at their facilities located in Southampton and Rugby, England.

This year SPI is celebrating its 20th

anniversary by looking at how far it has come over the past two decades, from generating lasers with just a few watts capacity up to the 20 kW machines it produces today, as well as looking forward to a future of continued innovation and development.

Mark Greenwood, CEO at SPI Lasers states: "It's taken dedication and commitment to become a leader in the design and manufacture of some of the world's finest fibre lasers, none of which would have been possible without being able to bring together some of the most creative and brightest minds in the business. Our ethos of encouraging sharing and learning has resulted in some fantastic developments and a lot of fun along the way.

I for one am looking forward to what developments the next twenty years will bring."

To find out more about SPI Lasers 20yrs of innovation visit www.spilasers.com/news/20-years-of-spi-lasers/

SPI Lasers, a wholly owned subsidiary of the TRUMPF Group, is a leading designer

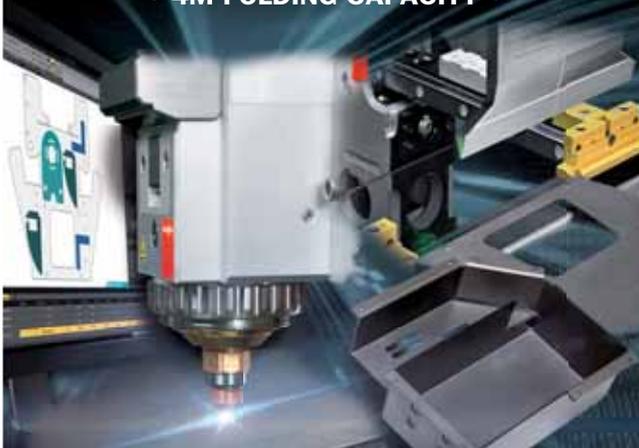


and manufacturer of fibre lasers for use in materials processing applications in a wide range of industries. Its technology solves manufacturing problems and moves the boundaries of what is possible, making good products better and enabling new designs. Headquartered in Southampton, United Kingdom, SPI Lasers has been operating since 2000. SPI Lasers sells its products globally and has its major business operations, including research and development and manufacturing, in the United Kingdom, with additional sales and customer support locations in Asia and North America. For more information, contact:

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Covering all the bending angles

Three LVD press brakes at Bridlington-based BW Industries have improved production efficiencies and accuracy on parts ranging from small brackets and cleats up to 9 m long structural beams.

The steel processing specialist has invested in two LVD 4.5 m 320T Easy-Form press brakes that can work together as a tandem machine to form components up to 9 m long and 8 mm thick. It has also installed a fast, compact, electric-drive Dyna-Press to give it more productivity on smaller components.

The company was formed around 45 years ago and is run by managing director Gareth Rounding, director of operations and sales Neil Pilling, financial director Dan Smith and general manager Steve Smith. Gareth Rounding & Neil Pilling each have around 25 years' experience in the business, buying a stake in the business in 2004 and completing a management buyout in 2016 along with Dan & Steve Smith

The company now has around 150 employees and turns over £25m, which has increased by £7m in the last three years.

BW is unusual in having both press brakes and roll forming lines, as well as lasers and fabrication facilities.

Neil Pilling says: "We produce anything to do with steel products: pressed, rolled, laser cut, assembled and painted. We are, in essence, a one-stop steel shop processing around 25,000 tonnes of steel a year."

Many of BW's customers are in the



construction sector, where the offsite construction of modular buildings is a strong and growing area. On the laser and press braking side, it also supplies customers in commercial vehicle building, motorway signage, crane booms and shipping containers.

BW Industries recently upgraded its EC certification of conformity and now supplies fabricated structural steel purlins, mezzanine steel channels, engineered wall panels and fabricated structural steel assemblies up to Execution Class 3 in accordance with BS EN 1090.

Gareth Rounding says that the move to offsite construction is significant, as the use of pre-fabricated modules produced in factory conditions gives major time and cost savings on site and ensures high levels of accuracy and quality.

Here BW's flexibility comes into play, allowing it to offer customers either a kit of parts including beams and cleats; fabricated floor and ceiling cassettes that can be simply bolted or welded together on site; or complete fabricated cubes that could be used for anything from a drive-through Starbucks, to a school classroom, a multi-storey office building or even a hotel.

Gareth Rounding says: "When you look at off-site constructed buildings you wouldn't know it was an offsite construction. The only thing that you might notice was that the bricks were too straight"

He adds that, whatever the customer, the main concerns are quality, accuracy, short lead times and competitive prices.

The decision to invest in new bending capacity came initially from a desire to replace some older machines, that were becoming difficult to support, with spares and service, but it also gave them the opportunity to bring BW's bending facilities up to the latest level of technology.

Neil Pilling says: "We set out to purchase new machines that were current in terms of the latest technology supported with spare parts, maintenance and service.



It is about efficiency and quality. For us, quality is paramount and that is what the LVD machines ensure. We wanted to give the guys on the factory floor the equipment and tools to do the job so we could reap the rewards and benefits."

Gareth Rounding adds: "Previously we only had a 7.3m press brake, whereas our laser capacity was 9m, so we decided on two independent 4.5m machines that could run in tandem to complement the laser."

He says that one of the advantages of LVD press brakes is that the design of the frame means LVD can build machines up to and beyond the size of the two machines at BW without the need to dig a pit for the foundations.

The key benefit of the machines for BW are their accuracy, speed of setup and the flexibility of having either two 4.5 m 320T machines or one 9 m 640T machine. It is effectively three machines in one, with a minimal changeover time to move to tandem operation.

Neil Pilling says that the accuracy over 9 m on the first test part was 0.3 mm and that the machines give a consistently accurate bend on every component.

This is due to the Easy-Form angle monitoring systems, automatic crowning and precise control of the Y1 and Y2 axes on each of the two machines all working together.

The type of parts produced by BW generally have fairly simple geometries and so they are very straightforward to program at the machine rather than using an offline programming system.

Neil Pilling says: "It is a very user-friendly interface and setups are very quick". He adds that the hydraulic tool clamping system helps speed setups too.

"For the new machines we purchased 200 m long top and bottom tooling which is hydraulically clamped by the machine. Changing tooling is now a one-man job, whereas before we were using 4 and 6 m long tooling which had to be craned into place by two people. The setup time comes down dramatically."

The tandem press is also fitted with four CNC sheet followers that support the material during bending, two on each machine, which can each support 250 kg at a given distance from the beam.

Neil Pilling adds: "If you are bending a 9 m

beam you need to be able to support it for health and safety reasons alone."

The tandem machine was not BW's first new press brake though. It also recently invested in an LVD Dyna-Press machine. This is a small, fast and accurate bending machine with an electric drive system that is ideal for bending small parts and is very easy-to-use.

Neil Pilling explains: "We were producing a vast amount of small parts on our larger press brakes that were taking up capacity and wearing out the centre of the bed. So, we looked for a machine that would be suitable for producing all the cleats and brackets. The Dynapress is very efficient and has certainly increased our production efficiency and capacity. It is very versatile and, because it is so easy-to-use, we have the flexibility to run the machine during our night shift as well if we need to."

The investment in the LVD machines is already paying off in terms of new business.

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VOSS Flare 110 forms tubes in a wobble process

VOSS Fluid has expanded its product range of pre-assembly devices. With the new VOSS Flare 110, the engineers from Wipperfurth have developed a tube forming machine that can perform fully automatic tube end machining using the wobble process. It is used to produce 90° and 37° flanging for the VOSS Flare ORFS (90°) and VOSS Flare JIC (37°) connection systems. With the new pre-assembly device, VOSS Fluid meets customer requirements for ORFS fittings.

With the new machine, VOSS Fluid uses the wobble process, which is gentle on the material and saves time. The tool makes a wobbling movement during which the tube end is precisely flanged against the supporting sleeve with minimum force. This process is an alternative to classical axial forming, in which the material is pressed into a negative form to create the desired contour. In the wobble process, the steel retains its unbroken grain and thus its high strength. The surface quality of the sealing surface is particularly good because no

machining marks are created thanks to the gentle forming process, while the steel exhibits higher resistance to fractures and tears.

The VOSS Flare 110 tube forming machine is suitable for the economical series production of ORFS (90°) and JIC connections (37°). It provides the user maximum process reliability, as operating errors are avoided during forming caused by the internal stop in the die. The all-electric drive also means that tubes with an outside diameter of 6 mm to 38 mm are processed with very low noise levels. This type of drive permits very precise and reliable control. It is particularly advantageous in very tight tube bends and very short clamping lengths.

For forming, rolling mandrels and clamping jaws with integrated slide for the sleeve feed (depending on the tube outer diameter) are used. The integrated slider in the clamping jaws means that the user does not have to reach between the clamping jaws to insert the ORFS sleeve but can simply feed the sleeve from the outside. As



an option, the machine is also available with a sleeve magazine (depending on the outer geometry of the sleeve). A feeder can be fitted for automatic feeding of the sleeves. This almost completely automates the insertion of the sleeves. The operator only needs to make sure that the magazine is filled.

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Bringing forging equipment online to meet expanding production requirements

When forging operations need to expand production to meet increased demand for existing parts or to add new product lines, selecting from the available options to bring new equipment online can be challenging. Ultimately, the decision involves striking a delicate balance between fitting within budget constraints and accepting what can often be very long lead times.

Forging machines, by design, are massive pieces of equipment that weigh between 25 and 300 tonnes and rise 10 to 25 feet above the production floor. Despite the violent nature of the forging process, the equipment is designed and built to last decades and it is not uncommon to find equipment from 50 or more years ago still in use.

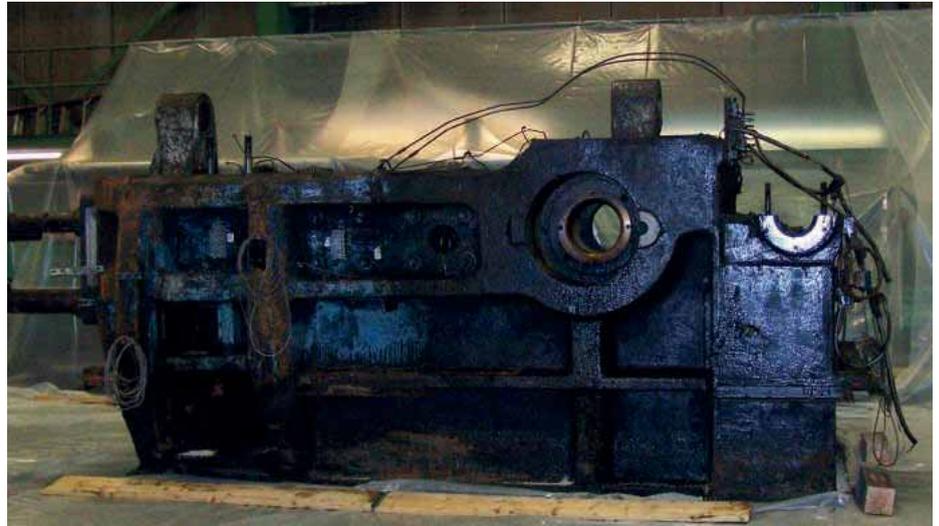
Unfortunately, this can be both a blessing and a curse when it comes to purchasing new equipment. The sheer size and complexity of the machine means that even items such as the massive cast steel frame can take six to eight months for delivery, not including the four to six months to install all the internal parts and componentry.

Given the longevity of the equipment, the other option is to purchase used forging equipment and have it rebuilt or remanufactured. This can speed delivery by as much as 6 months and reduces the impact on the budget, but the dwindling worldwide supply of used equipment is increasingly taking this option off the table.

The most immediate option to bring forging equipment online is simply to repair existing equipment or out-of-commission units. This often comes down to locating adequate replacement parts, which can be quite difficult.

The tremendous longevity of horizontal and vertical forging equipment can create unique challenges for a forging operation when a part they need to replace was built decades ago. Is the original equipment manufacturer still in business? Does a drawing of the part still exist? Can a local machine shop replicate it?

"Sourcing spare parts can be an ongoing problem," says Wade Ferguson, maintenance manager at Modern Forge Companies, LLC, a hot steel forging company in Blue Island, Illinois that operates



Top and below image: a 4" upsetter before and mid-progress cleaning for rebuild preparation



five manufacturing facilities with over 25 production forge units. "We probably run hammers tighter than what would ever be specified. And together with our high volume of forging, at times we are scrambling to make or find spare parts."

To produce engine valves and other motorcycle parts for customers like Harley Davidson, Modern Forge uses Chambersburg CECO die forgers that date

back to the 1980's and weigh between 20 and 50 tonnes.

So, when Wade Ferguson heard that Chambersburg was in bankruptcy many years ago, he was concerned. Fortunately, he had some replacement parts in inventory and was able to salvage parts from two offline units. Like other forging operations, he also sent some parts out to be reverse-engineered and machined.

This comes with some unintended risk, however. Machine shops often do not have access to critical specifications about high wear parts including the material grade of the steel, the heat-treating process utilised and tolerances that all were engineered specifically for that piece of equipment. The result can be parts that fail prematurely or wear much faster.

Soon, Wade Ferguson learned that the Park-Ohio Company had acquired the intellectual property rights to all Chambersburg and Ajax Manufacturing equipment in 2005. Ajax-CECO, as the company is now known, is one of the oldest manufacturers of forging equipment, having begun operations in 1875. In its more than 140 years of history, the company has built and put into production more than 6,000 horizontal and vertical units of forging equipment.

Fortunately, the provenance of forging equipment for both Ajax and Chambersburg equipment has been well maintained, including the original drawings, bill of materials and service manuals.

Most OEMs today also stock replacement



parts using MRP systems that monitor inventory levels and track historical trends for common wear items such as friction plates, driving plates, piston heads, piston rods, rings and packings.

In addition, some OEMs like Ajax-CECO offer stocking programs for long lead time items such as main gears, centric shafts,

rams, frames and anvils that most customers will not stock due to the cost.

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Hypertherm introduces subscription pricing for Design2Fab sheet metal layout software

Perfect for sheet metal fabricators, HVAC shops, and mechanical contractors, Hypertherm, manufacturer of industrial cutting systems and software, has announced subscription pricing for its Design2Fab® CAD/CAM sheet metal layout software for use with manual and automated cutting applications.

Rather than purchasing the software outright, as is typically required, companies and individuals seeking the ability to create complex custom fitting layouts in minutes, rather than hours, can now subscribe to Design2Fab on a monthly, annual, or three-year basis.

Monthly pricing is \$79.99 (U.S. Dollars), per user. For users outside the US, the actual price will depend on local exchange rates. Subscribers have the freedom to start a subscription, add or remove users when needed, and cancel at any time. Hypertherm is currently offering a free seven day trial subscription for anyone interested in trying Design2Fab. To learn more, visit www.hypertherm.com/design2fab.

In the past, businesses including general fabricators, and commercial and residential HVAC duct shops, often had to rely on sheet metal layout software that didn't fully meet their needs. Technical support was often limited to self-help online. Quickly creating complex custom fitting layouts that help ensure perfect fit-up when installing parts in the field, wasn't easily possible. However, with Design2Fab, subscribers get access to one-on-one live support from knowledgeable professionals, in addition to online resources such as video tutorials. This all contributes to increased productivity and lower operating costs.

"Design2Fab provides an excellent industry-proven solution for businesses who need to create flat pattern layouts for duct applications. The simplified job set-up allows even a beginner to the sheet metal trade to immediately start making fittings with a complete range of templates," says Bob Tiedt, a Design2Fab sales manager. "It gives businesses the flexibility to export patterns to DXF for automated cutting,



export to HPGL for printing to a plotter, or lay out patterns manually using XY or triangulation points. Also, for those looking to nest jobs, create reports and identification labels for ducts, Design2Fab is the only software offering integration to Hypertherm ProNest® nesting software."

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Aluminium cutting with XL package

Created specifically for cutting aluminium, the VA-L 560 from Behringer is a sawing system that sets new standards, both in solid material as well as in pipes and profiles with sophisticated cross-sectional geometry. The powerful machine scores with unparalleled high output and very short rest pieces of only 50 mm. The VA-L is designed for using carbide tipped circular saw blades with a diameter of 500 mm to 560 mm. With the XL package it is possible to achieve a cutting range of 240 mm round or 340 x 175 mm square material, using a 620 mm diameter blade.

The robust overall design, with the latest drive technology in the feed axis and a very stiff saw blade guiding, ensure an optimum, low vibration sawing process with excellent cutting performance, excellent surface quality at maximum availability. The frequency-controlled main drive offers facility for adjusting the cutting speed to the sawing process to allow cutting of both solid material made of high-strength AL-SI alloys and also thin-walled pipes and profiles. The servo motor-driven feed system in the optional Performance version defines a whole new performance category, using either constant or dynamic saw feed, significantly higher cutting outputs can now

be achieved while precise positioning of the saw head reduces downtime to a minimum. Used in combination with a pneumatic material clamping system, the servo motor-driven feed system allows machine hydraulics to be completely dispensed with. This radically simplifies the achievement of sustainable environmental management.

Maximum safety and good accessibility

The unique VA-L machine concept focuses on the twin themes of occupational safety and ergonomic design. The circular saw is completely encased in a full machine enclosure, eliminating any danger of injury. Another positive knock-on effect of full enclosure is reduced noise development and consequently a more pleasant working environment. Despite the full enclosure, all the important components and parts of the VA-L can be easily accessed. Large swivel doors offer optimum access for easy saw blade changeover, cleaning and machine maintenance. Extruded profiles with complex profile geometries are generally very difficult to machine and in order to ensure that the material is securely clamped while avoiding unwanted marks produced by pressure points on parts, the use of specially adapted shaped jaws is advisable.

Rapid jaw changeover, in conjunction with optimum machine accessibility, helps reduce tooling times to just a few minutes.

Automation is the key word when it comes to economic production processes. Savings with personnel and the use of additional low-operator shifts are only two options to make inroads into costs. The use of transport and removal systems and the possibility of linking up to magazines and storage systems means that operation becomes independent of day and night shifts with aluminium machining.

A high level of automation gives employees more time for other activities and helps to save their capacities as material is no longer positioned manually, but is program controlled. Operators are then mainly busy with process monitoring and strength-reducing work becomes an exception. Operating automated machines is also the superior alternative in terms of safety.

"With the handling of materials, you shouldn't only look at aspects of economy but also the safety of operating personnel when handling heavy, unwieldy parts," says Manfred Grüninger, focusing on another important factor. "Particularly where large production batches are being processed,



producers should consider link-up to downstream machining steps such as sorting or chamfering to ensure added streamlining effects."

Daily practice has also demonstrated that adaptation to continuously changing markets requires a high level of flexibility with material handling and with the use of personnel for many customers: "We don't yet know the demands of future orders of course, which is why customers want to be prepared, so in many branches they invest in a diversity of automation components," adds Manfred Grüninger.

In a class of its own - the compact new mitre-cutting bandsaw HBE320-523G from Behringer

Opening up new fields of business, extending the performance spectrum or replacing an old machine; these are among the most frequent reasons given by users for investing in an up-to-date, more efficient mitre sawing machine.

With its newly presented model from the HBE series, Behringer is offering the perfect way of combining the benefits of modern high-performance machines for individual sawing tasks with the robust and proven characteristics of a classical mitre saw.

"We deliberately integrated various features from our Behringer high-end models into this machine, raising the HBE320-523G into a class of its own and all at an optimised cost-to-performance ratio," says the company's CEO Christian Behringer. High cutting outputs, simple handling and precise angular cuts are among the key attributes of the new Behringer mitre-cutting bandsaw HBE320-523G.

With its extensive application spectrum, it reliably covers the wide-ranging requirements of metalworking workshops, the profile steel trade and machine builders.

Christian Behringer continues: "Even small and medium-sized operations in these fields are reliant on their sawing machines, dividing a wide range of different materials with optimum process reliability to a high standard of quality and at high speed."

With a cutting range in flat materials of 520 x 320 mm, bilateral mitre cuts of 45° and up to 30° on the left, this machine is the perfect all-rounder for all kinds of sawing operations.

"For reasons of cost and flexibility, profiles are generally purchased in starting lengths of up to 12 metres and then sawn to size," Christian Behringer adds. The new mitre cutting bandsaw is easily able to cope with both structural steels and stainless-steel profiles.

In design terms, the new mitre saw has many features in common with the HBE Dynamic series, which has already proved a resounding success. The guidance system in its torsionally rigid gantry design and the bilateral band wheel bearings ensure quiet running and precise cuts. The band guiding components are made of vibration-damping grey cast iron, which has a highly positive impact on the quality of the cut surface, but also makes for a longer blade life. Electrically powered chip brushes clean the saw blade of adhering chips synchronously with the saw drive system, an added bonus in terms of process reliability.

The tilt of the band wheels helps prolong the life of bandsaw blades by reducing fatigue due to cyclical bending. A fully automatic height adjustment facility for the saw frame, depending on the material height and lowering of the saw when in rapid traverse, help cut non-productive time to a minimum. The inclined position of the bandsaw blade allows components, such as girders, angled steel and U profiles as well as hollow



rectangular profiles, to be sawn at higher speed and with less burr. The sawing unit is mounted for easy turning in generously dimensioned axial roller bearings and can be swivelled with a simple manual action. The closed material table simplifies material handling directly at the cutting point and the machine comes with a micro-spray system as standard.

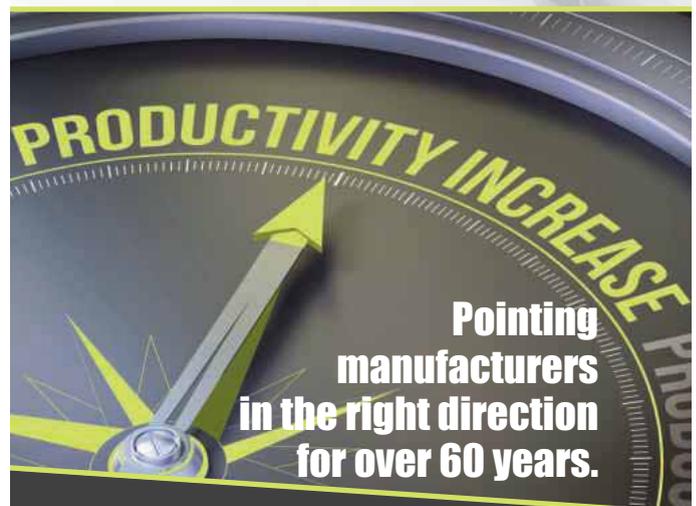
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As good as new: general overhaul of tube bending machines

To buy new or second-hand? When purchasing a car, consumers tend to make their decision based largely on price, and if you happen to have a well-maintained car in the garage whose only downside is a stuttering engine, then a trip to the workshop is usually the first port of call. A similar approach can be applied to tube bending machines. Many companies have been reliably using the high-investment machines for decades. But at some stage the technology might reach its limits. In some instances, a general overhaul can be an alternative to buying a new machine. In which cases does this make sense and in which not? Tube bending machine manufacturer Schwarze-Robitec provides an overview.

From the automotive industry to shipbuilding to power plant or boiler construction, in many industries tube bending machines are an indispensable part of the manufacturing process. They have to bend tubes precisely and quickly. Although a high-quality machine is a major investment, the costs are rapidly amortised. In addition, good machines are often in use for decades. Once the technology reaches its limits, many users decide in favour of a general overhaul of their machine.

When a client orders a general overhaul of one of its machines at Schwarze-Robitec, it is usually back in operation six months later. However, clients only need to be without their machines for around eight weeks. Prior to the overhaul, the tube bending machine manufacturer procures the necessary materials and purchased parts, then manufactures the components. Only then the machine is delivered and fully disassembled into its individual parts. Schwarze-Robitec sandblasts all welding components and the entire machine frame in order to remove the old paintwork. All welding seams are also checked, so whilst the machine frame and the welding components are re-used, all hydraulic and electrical installations are replaced, including hydraulic piping, cables, control cabinet, control technology and control panel. In addition, the entire machine safety system, including the CE components, for instance, is newly installed during a general overhaul. This is because statutory safety regulations have usually changed since the machine was first put into operation. This is



ultimately followed by the assembly of the overhauled machine, including the preliminary acceptance test at Schwarze-Robitec's site in Cologne and the machine being put into operation at the desired location, as is the case with a new machine. A 12-month warranty period is offered.

General overhauls are usually ordered by clients. However, in some instances the manufacturer sells a machine that has undergone a general overhaul. This can be a particularly interesting prospect for buyers if the machine configuration is ideally suited to their performance requirements and they are working on a tight budget. Since expensive parts such as the machine frame and welding components are re-used, an overhauled machine is roughly one-third cheaper than a new machine. And yet the buyer receives a product which is as good as new with state-of-the-art technology.

With Schwarze-Robitec's control systems from previous generations prior to the year 2000, there is often only a limited availability of spare parts and upgrades are no longer possible. If such machines are mechanically refurbished, the control technology will still pose a risk of failure and a general overhaul

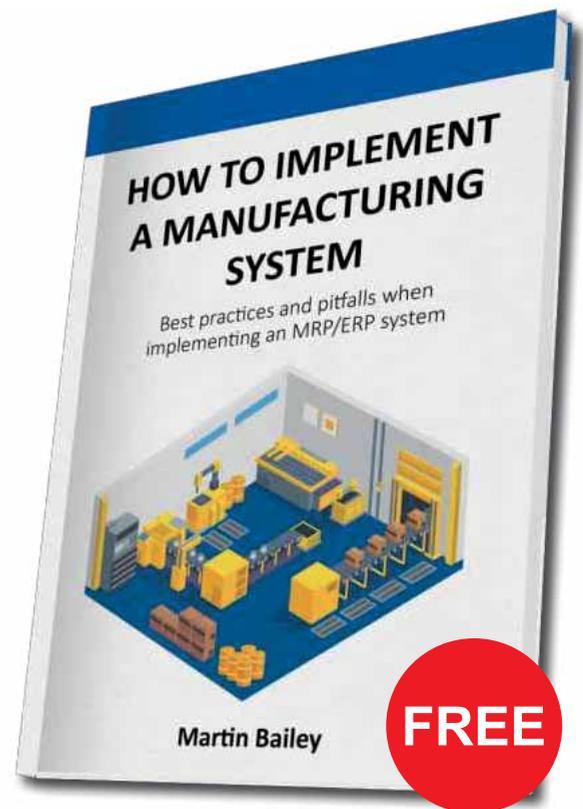
including a replacement of the control system is therefore a more sensible option. Should a client's production requirements change fundamentally, then a new machine is in order. Just as with a car, installing a new engine is not worthwhile if this is then shortly followed by a gearbox failure, or if the owner now needs a van instead of a station wagon.

Tube bending machines are similar to cars in terms of the intervals between necessary maintenance work: The car of an everyday commuter, equivalent to a machine working at high capacity in 3-shift operation, will be in for its next inspection quicker than that of the casual weekend driver. The frequency with which tube bending machines require maintenance work varies depending on their utilisation, workload and regular maintenance. It is therefore the combination of many factors that determines whether a general overhaul is a reasonable option: the time, the condition of the machine and the performance requirements in production.

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