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N Atherton
Nigel Atherton
XYZ MANAGING DIRECTOR



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MACHINE TOOL DEMOS ARE AVAILABLE AT ANY OF THE XYZ UK

1 Wheel it up.

The robot trolley is wheeled up to the front of the chosen machine tool and then locked into position.



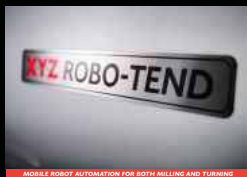
2 Lock it into position.

The loading trolley is then securely attached to the robot trolley. The robot identifies the trolley and its contents. The guard locks and ROBO-TEND becomes live.



3 Tell it the billet size.

With a conversational interface the robot controller can be programmed to know the shape of billet, material size and number of parts in the drawers.



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XYZ 2019 Machine Tool Range, each one the very best in its class.

XYZ 5 Axis and 4+1 UMCs



XYZ Turning Centres



XYZ Extra Large VMCs and Oil Country Lathes



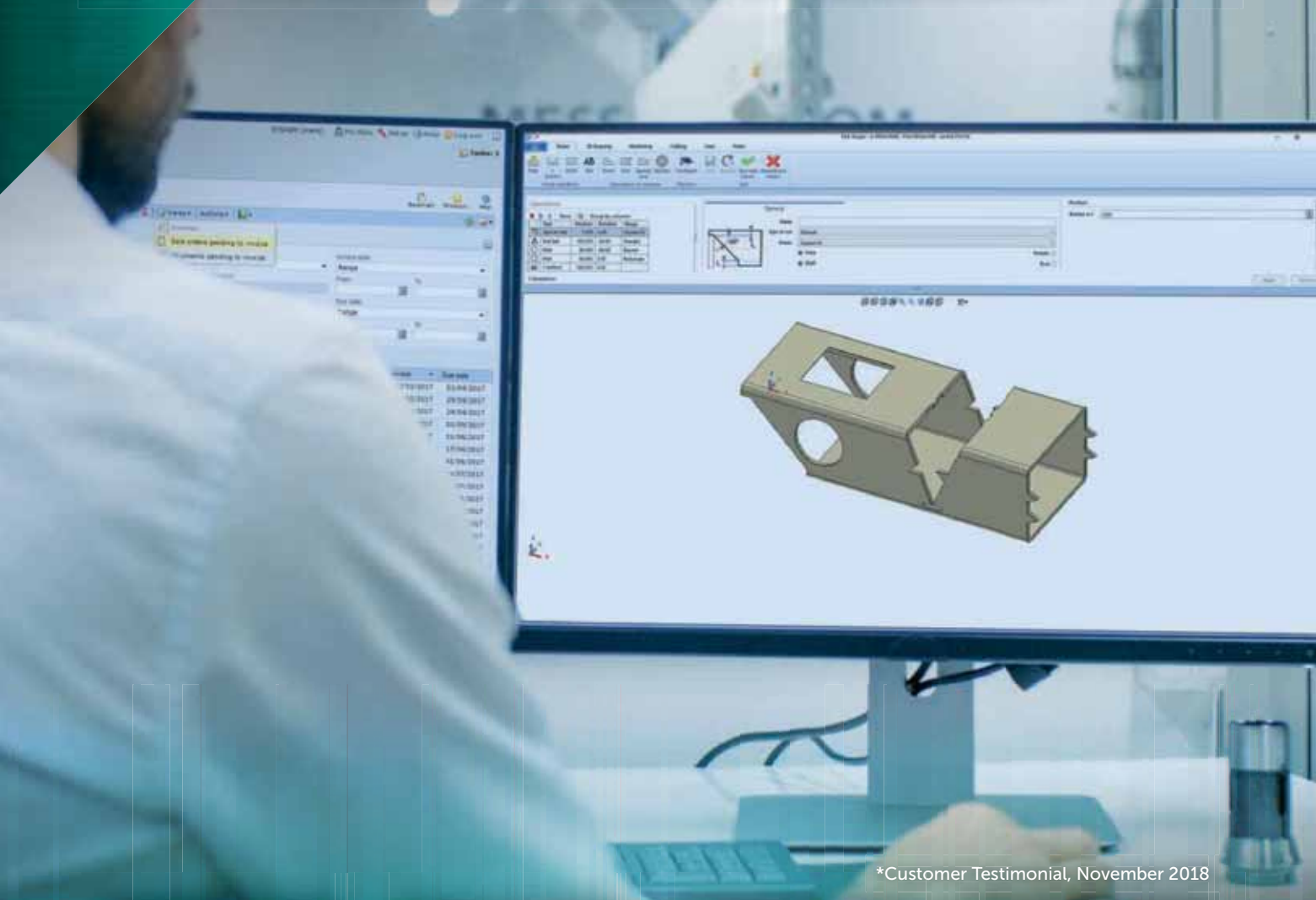
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*Customer Testimonial, November 2018

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XReimagine turning with CERATIZIT

With its combination of High Dynamic Turning and FreeTurn tooling, CERATIZIT has reimagined turning. High Dynamic Turning (HDT) flips conventional turning methods completely upside down. This new turning technology combined with the dynamic FreeTurn tooling means that it will be possible to carry out all traditional turning operations, such as roughing, finishing, contour turning, face turning and longitudinal turning with just one tool. HDT provides a completely uncompromising method of turning.



For 100 years, new cutting materials, new chip breakers and a few new tooling systems have been invented to optimise turning, but the actual basic turning process has remained unchanged. Even with multi-axis turn/mill centres, a contour is created with an indexable insert at a fixed angle to the workpiece.

CERATIZIT saw the opportunities presented by the dynamics of these machines and developed the High Dynamic Turning System. The simple idea behind HDT is that the tool approach and point of contact can be varied as opposed to conventional turning. So now, instead of the classic, static position of the insert in the holder, HDT utilises the milling spindle's 360° degrees of freedom to produce the ideal approach angle to the workpiece.

The use of the spindle drive, in conjunction with the slim, axial tool design of the FreeTurn tools by CERATIZIT creates a huge degree of freedom without the risk of collision, thus providing unprecedented flexibility and versatility. Thanks to the rotation around its own tool axis, the cutting-edge change can be carried out without interrupting the cutting process. Additionally, the angle of approach is infinitely variable at any time and can even be changed while cutting. This enables flexible machining of almost every workpiece contour, as well as generating optimum chip breaking, higher feed rates and increased tool life. Depending on the machine capabilities, the technology can be used functionally in all areas of turning operations. The positioning of the milling spindle along the Y/Z-axis on turning-milling centres creates multiple possibilities for the use of HDT that previously would have been considered unachievable. For example, cutting from above and below is now possible. Depending on the machining area and workpiece size, this freedom can be an important factor in efficient machining.

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Email: tony.pennington@ceratizit.com www.ceratizit.com

Advanced Engineering returns to the NEC, Birmingham

15,000 people celebrate a year of engineering success at Advanced Engineering



On October 30 and 31, 2019, the largest annual event for engineering professionals, Advanced Engineering will take place at the NEC, Birmingham. Over two days, around 15,000 people will have the opportunity to meet with Original Equipment Manufacturers (OEMs) and supply chain partners from sectors spanning the engineering industry.

Bringing together thousands of attendees, Advanced Engineering incorporates all aspects of engineering, from design, test and measurement, inspection, materials and production, within industries including aerospace, automotive, marine, medical and many more. At the show, representatives from across the entire supply chain of the UK's advanced engineering industry will present their latest innovations and business developments in front of some of its most influential stakeholders.

A new home for medical device engineering

This year, the latest zone additions are the Medical Device Engineering Zone and the revamped Enabling Innovation area, which will join the likes of aerospace and performance materials to host manufacturers and their new technologies in front of a targeted and enviable audience.

Supported by Medilink, GTMA, Gambica and other UK trade bodies, the Medical Device Engineering Zone will showcase researchers, medical parts and components manufacturers, software specialists and more. Visitors will also have the opportunity to hear from industry experts about the challenges, opportunities and fascinating innovations developing in the sector at the Medical Device Open Forum.

"We rely on visitor and exhibitor feedback to make Advanced Engineering better every year," explains Jeremy Whittingham, head

of marketing at Advanced Engineering. "Last year, we received comments about the rapid growth of the medical device industry and how it has become an integral part of the UK engineering sector."

The zone will catalyse ground-breaking technology and business transfer in the medical technology sector while giving exhibitors the opportunity to expand their reach to aerospace, automotive, and civil sectors. It also gives businesses involved in medical devices, from cleanroom equipment specialists, to diagnostic and testing devices and printing and labelling companies, the chance to connect with manufacturers and researchers from across the UK and overseas. No other event has ever done this before to this extent.

Enabling Innovation

This year's show also introduces the revamped Enabling Innovation Zone, which will give innovators a platform to showcase their inventions to thousands of key industry players from a range of notable companies. From senior directors and engineers to research and development specialists, chief technology officers and investors, a wealth of influential people spanning across the

world's most renowned manufacturing businesses will be visiting the zone.

Advanced Engineering previously called for start-ups across all engineering sectors, whether that be aerospace, automotive, marine, medical, automation or any other industry, to apply for a place in the zone. The 2019 shortlist, which consists of ten small enterprises from across the UK, will each have a dedicated display plinth on the show floor in the Enabling Innovation Zone.

Nominees include businesses from a range of sectors including; Fluid Maintenance Solutions Ltd, which offers a coolant fluid management solution, iCOMAT, which enables the automated placement of carbon fibre tapes on curved paths, and Texture Jet Ltd, which has developed Surface Texture Adjustment Technology (STAT), a tooling platform that enables users to rapidly produce a variety of surface textures on components.

Other nominees that have been shortlisted include Intra Drive Ltd, an Edinburgh based start-up that has developed drivetrain technology for the electrical pedal assist bicycle market, Holoxica Ltd, which specialises in holographic 3D imagery and motion video



and Acoustic Camera UK Ltd, which has produced the world's first portable, splash-proof, battery-powered acoustic camera that captures the equivalent of thermal imaging for sound sources.

ES Precision Ltd, which has developed lasers to perforate the inner liners of prosthetic limbs, making them more comfortable for users, has also been shortlisted, alongside Optima3D Technology Ltd, which designs and manufactures equipment that enables 3D weaving of composite materials, as well as a team from the University of Nottingham that has developed a handheld, touchscreen device incorporating machine vision and artificial intelligence (AI) learning platform.

Supported by Innovate UK/KTN, the Institute for Manufacturing and Innovation DB, the Enabling Innovation Zone has proven extremely successful in previous years, with one past exhibitor, Aceleron, even being listed in the Forbes 30 Under 30 Class of 2017.

"Following the success of the Enabling Innovation showcases, this dedicated zone will act as a springboard for new and exciting technologies," commented Jeremy Whittingham. "As we are establishing an entire area of the show for such innovative businesses, the impact the zone will have is bound to surpass that of previous years and encourage the growth of even more innovations.

"The companies that have been shortlisted for the 2019 Enabling Innovation Zone truly demonstrate the breadth of innovation and skill from the UK engineering industry. We're excited to welcome the companies to the event this year and look forward to announcing the winner at the show."



Listen up – Open Forum programme

Advanced Engineering will once again be running an extensive Open Forum programme, with speakers from Siemens Digital Industries, BAE Systems, McLaren Automotive and IBM Academy of Technology, amongst many others. For 2019, the event has secured a wealth of industry professionals to participate in forums that will discuss latest innovations, technologies and key issues in the engineering industry.

Other confirmed speakers include Ford Motor Company, GKN, DePuy Synthes - part of the Johnson & Johnson family of companies, Williams Advanced Engineering and Prodrive.

The Open Forum programme covers five of the six show zones; connected manufacturing, aerospace, composites, automotive as well as medical device engineering.

Each forum includes a schedule that offers insight on important topics in the industry and counts towards Continuing Professional Development (CPD) for attendees.

The Connected Manufacturing Forum will cover topics such as Industry 4.0 and data usage, while the Aerospace Engineering Forum will discuss additive manufacturing applications and aerospace 4.0. The Composites Engineering Forum will discuss next generation materials, the Automotive Engineering Forum will showcase sustainable and additive manufacturing and the Medical Device Forum include sessions on wearable technology, cybersecurity and 3D printing.

Voice of Industry

At the show, Advanced Engineering will also celebrate the launch of its Voice of Industry



report, which brings together the experiences of leading manufacturers, on topics ranging from Brexit and the skills shortage to the rise of electric vehicles and product innovation.

The Voice of Industry report delves into the unique challenges that businesses have faced in the last two years and explores the positive results they've had in overcoming uncertainty. It features Q&A-style interviews with senior figures in a variety of engineering businesses including Renishaw, Atlas Copco, Kawasaki Robotics, Novotek and Xi Engineering.

It also opens with a foreword from the British Automation and Robot Association (BARA). In it, Chairman Mike Wilson challenges the conventional view that uncertainty should be a fact of life. Following their contribution, BARA and Novotek will also join the programme of speakers.

With six shows under one roof, attendees will be able to access all their business solutions in one place, providing them with expertise from the breadth and depth of the advanced engineering industry.

"In times of uncertainty, whether that's in the marketplace, innovation or the choice of technologies available to you, industry leaders suggest that those who strive to invest will overcome doubt and make profit," concludes Jeremy Whittingham.

"That's why we believe in supporting and demonstrating the UK's flourishing engineering markets here at Advanced Engineering. To do this, we're expanding the show's offering to keep pace with the burgeoning growth of the UK's industry."

There's still time to register for a visitor pass for Advanced Engineering by visiting www.advancedengineeringuk.com.

Easyfairs

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Shown for the first time in the UK

How do you automate metrology to ensure the first part is a good part?

Modern production methods enable us to produce very complex parts quickly and automatically. The complexity of these parts then makes critical inspection challenging and, if performed manually, open to variation due to human influence.

The solution offered by Bruker Alicona is based on the well-proven optical metrology process of focus with a collaborative robot to fully automate and integrate the measurement process into production.

A video is available to view at:

www.youtube.com/watch?v=PY45VXyhIUk&t=8s

Automated placing and measurement

Alicona Pick & Place is an automation solution that makes it possible to set up a complete automation process within ten



minutes. Therefore, an optical measurement system is extended with a robot arm to automatically pick, place, measure and sort components. Pick & Place can also be used in smaller production environments and pays for itself within ten months. The system is based on the interaction between an administrator who pre-defines automation processes, the collaborative robot for the manipulation and placing of components, as well as high-resolution optical 3D measurement technology. The possible connection to existing production systems including ERP facilitates adaptive production planning.

Interfacing with machine, adaptive closed loop production

The machined component is removed from the machine by the robot, clamped on the measuring system and measured automatically. Depending on the manufacturing strategy, there are different options of



continuing the production process afterwards. Either the measurement result is fed back into the tool machine following a closed-loop strategy, where machine parameters are corrected automatically, and manufacturing continues in a self-controlling manner. Alternatively, an automatic sorting into OK/NOT OK pallets takes place after the 3D measurement for further processing.

Interfacing with worker-easy teach-in in only three steps

The user teaches-in an automated procedure in only three steps with no programming knowledge required. The robot handles component manipulation including the positioning on the measuring system and further sorting in OK/NOT OK pallets. Regardless of the number of components, only four parts per pallet have to be pre-defined. At the push of a button, the operator starts the entire process in production. After the measurement is finished, the component is sorted by measurement results OK/NOT OK and put in the respective pallet by the robot.

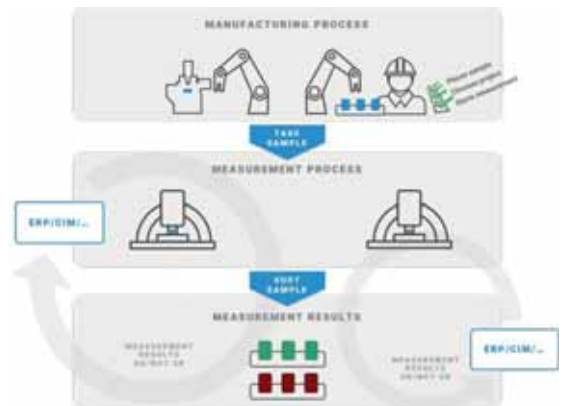
Use with machine tools

Pick and place is also used in conjunction with machine tools. The machined component is removed from the machine by the robot, clamped automatically on the

measurement solution and measured automatically. Depending on the manufacturing strategy, there are different options of continuing the production process after a measurement. Either the measurement result is fed back into the machine tool following a closed loop strategy where machine parameters are corrected automatically, and manufacturing continues in a self-controlling method. Alternatively, automatic sorting into OK/NOT OK pallets is achieved.

Closed loop: first part, good part

Closed loop in this case refers to a closed circuit enabling the first part to be a good part. Production systems, machines and measurement technology form a closed



loop. This means that 3D measurement is performed as an integral part of production rather than offline in a measurement room by different operators. This enables the verification of dimensions, tolerances and surface quality of a component at an early stage and details are fed back into production for correction.

Although the measurement system and cobot are standard products specialisation is necessary for component type. To find out more, contact:

Bruker Alicona
Tel: 01858 436940
Email: info.aliconabruker.com
www.bruker.com

Stand C11

TRUMPF technology takes the lead in the mass production of electric cars

Many decades of experience in high-tech manufacturing combined with the breadth of its technology base and its huge commitment to R&D puts TRUMPF in a unique position to support emerging trends with the best possible production solutions. E-mobility is a great example and at Advanced Engineering 2019 the company will showcase the scope of its involvement in this field.

In a short space of time, TRUMPF has been able to build up a worldwide network of experts entirely dedicated to this subject, adapted part of its product and technology portfolio to its demands and simultaneously embarked on a series of new development projects, often in partnership with existing industry players and market newcomers.

This agility has resulted in a huge surge in demand for TRUMPF solutions for e-mobility applications. Battery manufacturing alone already accounts for 10 percent of the company's turnover in the automotive sector, with more than 500

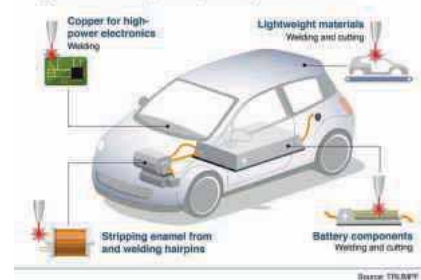
TRUMPF lasers having already been installed worldwide for this purpose. Indeed, its lasers are proving ideal for the mass production of batteries, high-power electronic systems and electric drives.

Visitors to Advanced Engineering will learn about the latest TRUMPF developments for e-mobility, ranging from laser techniques that can weld all the seams on an electric motor in just one minute to its TruConnect solutions. These allow the entire production process to be digitised, from initial customer queries to invoicing and from raw material ordering to finished product dispatch.

Mass production of any product, be it consumer-based or industrial, commonly involves marking for tracking and traceability. TRUMPF laser marking is the ideal solution. Whether the requirement is for digits, text or codes, the technology is a non-contact wear-free method that can easily mark all these elements and more, for a wide range of industries.

How laser technology is making electro mobility possible

High-precision laser technology is enabling the mass production of electric cars



At the show TRUMPF will be introducing a newcomer to its range, the TruMark Station 5000, which is well-suited to marking average to large batch sizes and components. It provides many options for simple operation and for a wide variety of workpieces. A choice of accessories allows the machine to be configured for the specific applications.

TRUMPF Ltd
Tel: 01582 725335
Email: sales@uk.trumpf.com
www.uk.trumpf.com

Stand E22

Rhodes Interform to demonstrate composite and metal forming expertise

Rhodes Interform, a specialist in bespoke composite and metal forming machinery, will be showcasing its expertise in superplastic forming and diffusion bonding at the Advanced Engineering Show.

The company designs, manufactures and installs titanium and aluminium forming cells for leading aerospace and automotive manufacturers worldwide. This recently included designing and manufacturing a world class composite forming facility at the University of Sheffield's Advanced Manufacturing Research Centre (AMRC). The composite forming press is being used as part of a state-of-the-art facility to assist UK companies to stay at the leading edge of composite development.

Rhodes Interform's composite machinery is used to produce structural components for production road cars as well as flight critical components for a variety of aircraft. The company also offers a wide range of cold forming technologies for specialist metal forming applications across a range of industrial sectors.

Mark Ridgway OBE, CEO of Group Rhodes, says: "The Advanced Engineering

Show is a superb platform for us to demonstrate our composite and metal forming capabilities. Our team will be discussing how they can help manufacturers to meet their equipment requirements, using our expertise gained from almost 200 years in the metal forming industry. We will be explaining about the servicing packages we offer to minimise downtime and maximise longevity and performance of the equipment."

All Rhodes Interform's machinery is supported by a comprehensive aftermarket spares and service team which maintains the company's equipment throughout the world.

Advanced Engineering 2019 will be attended by a huge number of leading OEMs and supply chain professionals who want to see the latest technologies and solutions across the Aero Engineering, Automotive Engineering, Composites Engineering, Connected Manufacturing, Performance Metals Engineering and Contract Manufacturing zones.

Rhodes Interform is a global manufacturer and service provider of hot and cold forming



equipment for metals and composites. It is part of Group Rhodes, a company that boasts a 200-year metal forming history and has been forming composite materials from as early as the 1930s. The company has won Queen's Awards for both Innovation and International Trade in recent years.

Group Rhodes
Tel: 01924 371161
www.grouprhodes.co.uk

Stand L50

Starrag brings 'Engineering precisely what you value' ethos to EMO

While Starrag presented at least three machines on show at EMO, including the just-announced Starrag NB 151 machining centre designed specifically for machining aircraft impellers and blisks, the staff on hand and the technologies on show at EMO forcibly reinforced the company's ethos of 'Engineering precisely what you value'.

Starrag's success policy across all its product lines: Berthiez, Bumotec, Dörries, Droop+Rein, Ecospeed, Heckert, Scharmann, SIP, Starrag and TTL, in companies of every size and across all industry sectors, has been built on providing machining solutions tailored for individual customer needs.

These extend from a stand-alone machine with, for example, bespoke workholding and tooling solutions, as well as certain spindle and machining head options, such as those required for single setup multi-tasking machining that may involve milling, boring, turning and grinding. It also extends to fully automated flexible manufacturing systems with multiple machines complemented by sophisticated workpiece handling/transport options.

Whatever the size and scope of machining, Starrag can supply the appropriate cell and software control necessary for 21st century manufacturing, as well as embracing a host of functionalities for the integration of Industry 4.0 strategies.

Examples of all these technologies on the EMO stand featured a small sample of the extensive range of machines available from the Starrag Group. On show were a Starrag NB 151 blisk and impeller machine, a Heckert T45 5-axis horizontal machining centre with rotary table, a Bumotec s181 5-axis mill-turn centre and a Sprint Z3 parallel kinematic machining head.

Starrag all-new NB 151 blisk and impeller machine

Targeted at blisks and impellers up to 600 mm in diameter, Starrag's all-new NB 151 features a number of world-class developments for the effective and efficient machining of blisks. In particular, an innovative rotary (A and B) axes spindle allows the tool/cutting angle to be positioned relatively closer to the



workpiece, resulting in not only a more stable machining process but also an effective route to minimal cycle times.

Heckert T45 5-axis horizontal machining centre

With X, Y and Z axes travels of 700 mm by 750 mm by 750 mm respectively and rapid traverse rates of an impressive 80 m/min, the T45 is one of a range of Heckert T Series 5-axis horizontal machining centres.



Crucially, with a fast-rotating (900 revs/min) trunnion table, the machine is ideal for the complete production, including turning routines, of complex workpieces in a single clamping position.

Bumotec s181 5-axis turn-mill machining centre

This will be demonstrated machining a titanium steel spine surgical hook from 25 mm diameter bar, applying a total of 17 tools (including five live tools) to complete the part in under 14 minutes compared to almost 20 minutes on a single-station machine.

The machine has a 30,000 revs/min HSK 40 spindle (optionally 40,000 revs/min) and 90-tool magazine. It will also feature ESPI's



Scanflash technology for in-line production monitoring/transfer of correction values directly to the machine to, if necessary, automatically make instant adjustments to production parameters.

Sprint Z3 parallel kinematic machining head

The Sprint Z3 parallel kinematic machining head is an invaluable aid to improved machine performance and flexibility. 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 +/- 40 degree at a maximum of 80 degree/sec. If the three axes move differentially, the spindle platform will be tilted in the A/B kinematic.

Headquartered in Rorschach/Switzerland, the Starrag Group operates manufacturing plants in Switzerland, Germany, France, the UK and India and has established a network of sales and services subsidiaries in the most important customer countries.

Starrag UK Ltd
Tel: 0121 359 3637
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All of these machines are immediately available.



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GF Machining Solutions, the EDM, milling and laser texturing machine tool manufacturer and automation and tooling systems specialist, has supplied leading precision subcontractor Thomas Brown Engineering Ltd with a new high-performance 5-axis machine.

The Mikron MILL P 500U was installed at the company's 20,000 square foot facility in Huddersfield in January 2019 and is being used to machine precision components for customers operating in the aerospace, medical, automotive, robotics, food processing, oil and gas and steel manufacturing/ processing sectors.

The components machined on the MILL P 500U are diverse and varied. Typical materials machined include aluminium, steel, stainless steel and Inconel, and batch volumes (sizes) are mainly in the low to medium range.

The components machined on the Mikron are characterised by their accuracy and impressive surface finishes with a 20-micron geometric tolerance and a Ra 0.2 µm surface finish requirement being the rule rather than the exception.

Managing director Tom Brown says: "The sectors where we operate are competitive and demanding. Quality is non-negotiable, and ever-stringent delivery times are increasingly prevalent. To meet customer demands and survive in these environments you need to be committed to continuous improvement and continually raise your game.

"By investing in the latest and most advanced machine tool technologies and by combining our manufacturing prowess with excellent customer service, we have found that we have been able to grow our business."

Thomas Brown Engineering was established in 1983 by current managing director, Tom Brown. Over the last 35 years, the company has grown steadily from being a one-man band in the early days to a business that now employs 20 members of staff.

Other changes in the company have been even more noticeable and dramatic.

Tom Brown continues: "When the company was created, it operated out of a couple of old garage units. As a fledgling engineering subcontractor, we were at that time relying on a couple of used manual



Mikron MILL P 500U and Mikron HPM 450U machines at Thomas Brown's facility

machines to machine parts and to make a living."

In stark contrast to these early days, the company today has 14 CNC machine tools at its disposal and is looking to increase its floor space by the end of the year by an extra 4,000 square feet.

The company's customer profile and customer base has also changed significantly, as Tom Brown explains: "We are a Tier 2 supplier in the sectors where we operate. The investment we have made in a plant, people, technologies, systems and processes has enabled us to consolidate our position in these sectors with existing customers and win new contracts with new customers too."

This is exemplified by the company's position in aerospace sector, where its AS9100 accreditation has been instrumental in achieving a number of new contract wins.

This increase in demand for the company's engineering services did, however, create some production issues resulting ultimately in the decision to invest in the new Mikron MILL P 500U.

Tom Brown continues: "We audited and reviewed our machining strengths and

weaknesses, identifying where the 'pinch' points existed. The exercise helped determine that we needed to increase our 5-axis milling capacity and capabilities as a matter of some urgency.

"We had previously invested in a Mikron HPM 450U 5-axis machine some years earlier and the machine had served us well. We particularly liked the machine's built-in automation and the way in which its integrated automatic pallet changers have helped us increase our productivity and efficiency and reduce our operational costs."

The company drew up a list of technical and performance requirements for the new machine and benchmarked these against the 5-axis machines in GF Machining Solutions' portfolio. It soon became clear that the MILL P 500U was the preferred choice.

The Mikron MILL P 500U 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. It features a thermo-stable

and symmetrical design, so that even when machining at a fast pace and over long production runs, accuracy and process reliability remain high and consistent.

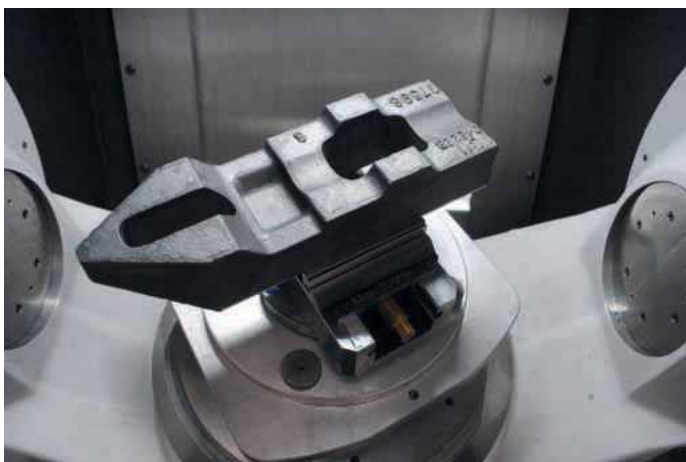
The machine delivers fast acceleration (1.7 g) and is equipped with a powerful, high-torque 36 kW Step-Tec motor spindle that is reliable and gets down to business fast.

Its productivity is enhanced by its in-built automation, which comprises up to a 215 position ATC and up to a 12 pallet APC.

The company also wanted the machine to be able to perform interpolation turning operations. Interpolation turning is a



The components machined on the MILL P 500U are diverse and varied. Typical materials machined include aluminium, steel, stainless steel and Inconel, with batch volumes (sizes) mainly in the low to medium range



machining technique developed for advanced machining centres and B-axis multi-task machines. It enables a turning operation to be carried out by interpolating the X- and Y-axis in a circular direction and rotating the machine spindle in time with the rotational contour.

The circular movement can either increase or decrease in diameter to produce facing operations or be combined with the Z-axis to produce a bore or outer diameter.

Tom Brown concludes: "The MILL P 500U is a great machine. It is accurate, fast and flexible. We mainly use it for 3 + 2 positional 5-axis machining operations, as opposed to full simultaneous 5-axis machining, and its performance to date, no matter what we've asked it to do, has been exceptional."

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Pryme cut

Pryme Group is a relatively new name but, armed with an engineering track record going back 40 years, it is shaking up the UK's market for contract manufacturing services.

The North East of England has always been a hotbed of subcontract manufacturing. However, in recent years, a new name has been shaking the market up, namely Pryme Group, whose rise has been nothing short of meteoric.

Created in 2014 from a core of three engineering companies, GA Scotland, GA Sliding Head and GA North West, the company catapulted itself into the first rank of contract manufacturing companies with three acquisitions in the Newcastle area in 2015, namely MKW Engineering, Stargate Precision Engineering and TME Hydraulics.

A year later, subsea specialist SengS joined the group and in 2018 Hydratron, a global supplier of high-pressure equipment, was snapped up. While the company now boasts a range of engineering services, from design and consultancy through to fabrication, testing and coating, its heritage and strength remains in CNC machining, with more than 140 machines across the group.

Pryme Group now focuses on three core areas: oil and gas, defence and aerospace, with a blue-chip client base that includes names as diverse as BAE Systems, through to Schlumberger, Siemens and Rolls Royce.

In 2017, work began on the Group's new North East facility that aimed to bring the three Newcastle acquisitions together under one roof. The new 58,000 sq ft manufacturing facility based in North Tyneside, which cost more than £10 million to refurbish, is home to more than 20 CNC machines.

The Pryme Group's close relationship with Mazak is clear as soon as you visit the new facility. In fact, the Group recently acquired five new Mazak machines in order to enhance its machining capabilities.

Dave Graham, group business development director, has been responsible for all of the machine specifications: "The Mazak machines were bought to extend our capabilities, specifically in heavy-duty machining. At this new site, we're focused on a wide range of sectors, from marine and land systems for oil and gas, through to energy and rail, for companies like Bombardier. The quality of the machines is a

vital part of winning business in these sectors.

"My own relationship with Mazak goes back 20 years, having specified a range of machines from QUICK TURNS and VTCs through to INTEGREGX in previous roles, including MKW Engineering, prior to its acquisition by Pryme. In fact, I bought the first e-1600V machine into the UK for a non-OEM. The quality of the technology is not in question."

One of the most significant recent investments has also been in a Mazak e-1600V, this time for Pryme Group. The machine is an advanced vertical multi-tasking machine for all one-chucking, equipped with a 2-pallet-changer and capable of completing all machining operations in a single machine setup. The machine is specifically designed for heavy duty machining as it is equipped with a 37 kW, 50 taper 10,000 rpm spindle.

Crucially, for Pryme, the e-1600V has an exceptionally large capacity which makes it ideal for large workpieces with dimensions of up to 2,050 mm diameter by 1,600 mm and is also capable of handling a load of up to 5,000 kg.



"We have taken a conscious decision to transfer our technology upstream into 5-axis work," continues Dave Graham. "With the 1600V, for example, we are doing a lot of multi-axis work, programmed both on and offline. There are two programmers on-site and we are able to put the models they generate straight into the machine."

The e-1600V was joined by an INTEGREX e-670H, which is also designed for large workpiece machining, due to its high performance turning and milling spindles able to cut difficult to machine materials. The machine is capable of working with exceptionally long workpieces of up to 1,070 mm diameter and 4,000 mm long work capacity. To aid this type of machining, the e-670H is equipped with a steady rest and long boring bar stocker for deep machining of workpiece inner diameters of up to 100 mm diameter by 1,000 mm length.

Pryme has also invested in a Mazak HCN-6000, a high rigidity machine ideal for high-volume large heavy-part operations. Specifically, the machine is equipped with a 10,000 rpm 37 kW 50 taper spindle.

"The new machines have opened up the potential for us to move into new markets, specifically those areas, such as oil and gas," says Dave Graham. "The common denominator with the new INTEGREX, the HCN and the e-1600V is capacity. There are very few contract manufacturers in the North East who have machines capable of machining workpieces of the size we can now work with."

In addition to the heavy-duty machines, Pryme has also recently invested in a vertical travelling column machining centre and a new turning centre complete with automation. The VTC-530C is a highly



versatile machine that can be used across a range of machining applications and is equipped with a 12,000 rpm, 18.5 kW spindle delivering outstanding productivity to reduce machine cycle times and a QT-COMPACT 200MY with bar feeder, a turning centre with rotary tools and a Y-axis.

"The new machines give us extra capacity with the manufacture of smaller components," concludes Dave Graham. "All of the new machines are equipped with SMOOTH Technology. It's a brilliant CNC."

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Subcontractor installs more 5-axis machining capacity

Having doubled the size of its premises in 2016 and the same year purchased its first 5-axis machining centre, a Hurco VMX42SRTi with swivelling B-axis spindle, subcontractor Almond Engineering has now installed a second, similar model.

Managing director Chris Smith favours this style of 5-axis machining centre over the trunnion-mounted rotary table arrangement due to its versatility for tackling a greater variety of work, including 4-axis machining of large components.

Last year saw the arrival of a Hurco VMX30i, purchased with a 4th axis rotary table to speed setups, increase production efficiency and reduce delivery times, plus a larger 3-axis VMX60i with 1,525 by 660 by 610 mm working volume that significantly extends the size of component that can be machined on the Livingston site.

Overall spend in 2018 exceeded £400,000 and half that figure is due to be spent again this year, including on new software. Driving this level of investment was 25 percent growth in 2016/17, a further increase in turnover the following year and a predicted

19 percent rise this financial year. It is a pace that Chris Smith describes as "almost too fast" in view of the perennial difficulty in hiring skilled staff.

Much of the growth has come from winning new business from the medical sector in Scotland, such as the assembly of lines for producing contact lenses and the machining of parts for operating theatre equipment. The industry now accounts for eight percent of the company's revenue by value.

Semiconductor firms across the central belt of Scotland are the other main sector serviced, while contracts are also received from the ever-resilient aerospace and defence industries. A hallmark of the subcontractor's service is significant design input into the mechanical engineering aspects of the contracts it undertakes.

Celebrating the 40th anniversary of its inauguration this



Working area of the Hurco VMX42SRTi 5-axis machine showing the B-axis spindle and C-axis flush rotary table



One of the pair of Hurco VMX42SRTi 5-axis machining centres installed at the Livingston factory of Almond Engineering

year, Almond Engineering now operates eight Hurco machine tools, a TM8 CNC lathe with 8-inch chuck and seven machining centres. The latter form the vast majority of prismatic metalcutting capacity on site, the only other machining centre being a Bohner & Koehle bought in the 1970s.

As to the subcontractor's continued purchase of the Hurco brand, Chris Smith comments: "Ours is a prototype and small batch production environment, so efficient shop floor programming is important to us. We rely on it 90 percent of the time."

"Back in 2004, we had a number of manual tool change mills and one vertical machining centre, but spent more time programming them than actually cutting metal."

"To take over from them, in 2004 we bought our first VMX42 with a 1 m X-axis. The Hurco control was clearly ahead at the time in terms of the speed and capability of its conversational programming and has continued to lead

the market ever since. Additionally, the machines themselves are cost effective to buy as well as being robust, reliable and accurate. We regularly hold ± 0.01 mm when cutting virtually any material, from Inconel and Hastelloy through steels and aluminium to plastics."

He pointed also to the user friendliness of Hurco machines, with staff able to move seamlessly between the twin-screen WinMAX controls powering the larger machining centres and the single-screen MAX controls on the smaller VM1 machining centre and TM8 lathe. The subcontractor's hyperMILL offline CAM system is used mostly for programming more complex 3+2 axis cycles to reduce set-ups and improve accuracy on the 5-axis machines and to create some fully interpolative cycles as well.

Organic growth at the Livingston company has resulted in the number of employees rising from 24 in 2011 to 37 currently, including three apprentices taken on recently. Much effort is put into training the existing workforce and cooperating with local schools to promote engineering and STEM (science, technology, engineering, mathematics) subjects with an eye to future recruitment of employees.

Most recently, in June 2019 Almond Engineering completed its first company takeover by acquiring the trade and assets of another Livingston company, Multex, which will see turnover increase by a further 16 percent. Established in 1991, the firm designs and manufactures test equipment for electronic circuit boards and has a number of customers that are common to those of Almond Engineering.

A further benefit is the additional CNC and manual machining



A 6082 aluminium test base plate for a military aircraft being machined on the VMX30i

facilities that are available at the Multex site, giving both businesses increased capacity, flexibility and factory floor space. No jobs were lost as a result of the acquisition and an additional, skilled appointment has already been made, with more anticipated.

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A detailed image of a Blum LC50-DIGILOG laser interferometer. The device is black and silver, with a red laser beam being projected from its tip. The beam is focused on a small point, creating a bright red spot. The device is mounted on a metal surface. In the background, a computer monitor displays a 3D model of a part with green and red lines, indicating the path of the laser beam. The text "Thousands of values per second. Fast. Precise. Reliable. LC50-DIGILOG." is overlaid on the image. The Blum logo and "focus on productivity" are also visible in the bottom right corner.

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Doran relies on Haas 5-axis solutions

Kieran Doran installed his first manual lathe in 1993, in a small shed at the side of his house. His one employee, Leo McGreevey, began turning while Kieran was still holding down his day job, coming home and working on the new business at night.

Eager to follow in his fathers' footsteps and having helped out during the school holidays, Kieran's eldest son Christopher joined the company in 2005 as an apprentice and in 2018 his sister, Ciara stepped into the account manager role.

Today, Doran Precision Engineering Ltd (DPE) specialises in the manufacture of precision components, offering batch production work, rapid response and rework services. Still a family run business, it employs 22 people, utilising 31 CNC machines.

90 percent of the factory's output serves the aerospace industry, supplying a worldwide customer base, making interior parts for aircraft giants such as Thompson Aero Seating and Collins Aerospace. DPE machines a wide range of aerospace grade materials including aluminium, stainless steel and plastics.

All production is programmed by state-of-the-art software and is supplied with a full FAI. Doran was first accredited to ISO:9001 in 2006 and in 2018 was accredited to AS9100 Rev D.

"It was 2011 when we bought our first Haas. We wanted to offer machining on a larger scale, so looked for a mill with a more substantial capacity. We shopped around," explains general manager Christopher Doran.



"Having been to the shows and looked at all the options, the one machine that stood out to us was the Haas VF-9. This machine had one metre of travel on the Y axis and for such a large frame mill, the price was exceptional. We bought our first Haas shortly after and haven't looked back since."

The VF-9 has used the whole of the 2134 x 1016 x 762 mm table to machine everything from base plinths for aircraft seating to hinges for table assemblies, machining each with precision and power and never faulting due to size or weight.

A strong partnership was begun between Doran and Haas, which has brought the total number of Haas machines to 16 in the last 8 years.

"The Haas control is similar to a FANUC

control, so it mirrored our older machines. We were up and running straight away" explains engineering manager Kieran Poland. "It meant we could use our existing programs which made the transition very easy. We only buy Haas now."

Today, with three units stretching over 10,000 ft² at the company's premises in Newcastle, Northern Ireland, capacity is rapidly increasing and the machines are in constant use.

"We have 12 Haas Super Speed mills," says Kieran Poland. The Super Speed mills boast a 12,000 rpm spindle and high speed 24 + 1 side mount tool change. Their addition has been invaluable. The increased spindle speed and rapids have reduced our cycle times by 50 percent and the spindle power is unrivalled. They cut aluminium constantly on full revs, as deep a cut as the spindle will allow. I haven't found anything the spindle doesn't have the power to cut."

Christopher Doran also values Haas' reliable aftercare service: "We rarely have an issue but if we do need an engineer they're on site quickly."

"We recently added three UMC-750 5-axis Universal Machines to our Haas family, allowing us to produce both small batches and prototype work in a much shorter time frame. Using the latest Mastercam package, with the UMC's 12,000 rpm spindle and 40 + 1 side mount tool change, we quickly found cycle times were reduced by 30 percent.

"These were our first 5-axis machines, but they were easier to use than I'd imagined," enthuses Kieran Doran. "They really worked for us. We use them for 5-sided machining, making multi-option parts, we finish them in much shorter lead times with a higher accuracy and precision.

"Following on from the success of our UMC-750s, we have just installed the new Haas UMC-1000. We're excited to see what we can do with the larger working envelope. We've also just installed our first Haas 4-axis rotary table and are looking forward to capitalising on the advantages of lights out machining."

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Mastercam gets the best out of ModuleWorks 5-axis technology for barrel tools

CNC Software Inc. has integrated the new ModuleWorks 5-axis barrel mill components into the latest version of Mastercam CAD/CAM software to expand its Accelerated Finishing technology support. With its best-in-class tool management and intuitive user interface, Mastercam 2020 utilises the full productivity benefits of the barrel mill strategies, which now support taper, oval, and lens style tools.

Mastercam already uses the full range of ModuleWorks multi-axis toolpath generation and simulation technology and the two companies worked closely together to ensure a fast, seamless and high-quality integration of the latest barrel mill features.

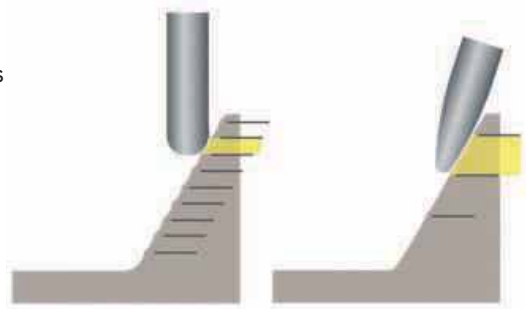
Barrel mill tools are especially useful for cutting parts with steep features, such as those found in the aerospace, automotive and die/mould industries. The barrel shape of the tool generates smaller cusps to deliver a high-quality surface finish using large step overs that significantly accelerate the machining process. The Mastercam user interface simplifies and optimises the toolpath generation workflow and adds

further productivity and quality enhancing features controlling step-over and step-down parameters that utilise the full potential of the ModuleWorks components.

As part of the integration project, CNC Software conducted in-house machine trials to rigorously test and optimise the 5-axis barrel mill strategies.

“Working in close cooperation with the ModuleWorks integration team ensures we get the best out of the ModuleWorks technology to continuously empower our users with productivity maximising features and benefits,” says Stas Mylek, partnership program manager at CNC Software Inc. “We look forward to a continued successful cooperation and further technological advances arising from the unique synergy of our technologies.”

“Barrel mill tools bring productivity benefits to milling applications and it’s great to see how Mastercam unleashes the full power and potential of our 5-axis barrel mill technology,” says David Plater, technical



Mastercam accelerated finishing

director at ModuleWorks. “The results of this project underline the benefits of close cooperation to ensure optimal integration and a high-quality solution.”

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Photos courtesy and copyright of CNC Software, Inc.

New dimension of 5-axis precision

At EMO 2019, KERN Microtechnik presented for the first time its brand new KERN Micro HD 5-axis machining centre. The new machine was shown in combination with the EROWA Robot Compact 80 automatic component loading cell, which is exclusively available in the UK and Ireland from Rainford Precision.

KERN demonstrated how small, delicate and also large components can be mass produced fully automatically with precision down to the nanometre range, opening wide a new field for cost efficient production.

The machine has a very compact footprint of 1,650 by 2,660 mm with a height of 2,633 mm. The HSK40 spindle has a remarkable speed range from 500 to 42,000 rpm with both through-tool coolant or air blast available. This combination enables components to be produced efficiently with impeccable surface finishes while also being cleaned before they are automatically stored for the operator.

Component loading and unloading is available with various options, while the

machine at EMO encompassed an external workpiece magazine that can load small as well as large workpieces by automatically changing the size of its workpiece grippers. For customers with small workpieces, these can be held in the tool magazine and offer either 30 or 60 workpiece positions, thus reducing the size of footprint even when working automatically.

As a world leader in micro precision production, the axis movements of the brand new KERN Micro HD 5-axis machining centre are a combination of linear drives and hydrostatic guideways. This ensures the highest possible level of accuracy and slip slick prevention. This unique development permits table movements and positioning to a level previously beyond the realms of precision and quality in standard machine shops.

The Micro HD is the latest machine to be added to the KERN Micro family, which currently consists of the KERN Micro PRO and the KERN Micro Vario.

A specialist in micro machining, Rainford Precision is regarded as the ‘go-to’



company in all things ‘micro’ with a wide-ranging portfolio that encompass everything from machine tools and spindles, cutting tools, waterjet and laser machine solutions.

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Addison's superior CNCs ramp up production for Hydro Components

Addison Saws Ltd, the West Midlands-based machine tool supplier recently installed a total of four Mecal CNC machining centres into Hydro Components Ltd (formerly SAPA) to increase production of complex aluminium parts destined for state-of-the-art electric vehicles.

Hydro Components Ltd recently invested £9.6m in the refurbishment and re-opening of its manufacturing plant based in Bedwas, Wales. Three Mecal Kosmos 4-axis machining centres were added, as well as a Mecal Geos MDT 5-axis machining centre, the first of its kind within the UK, along with a restructure of the entire plant. Fuelling this decision was an extensive contract for the supply of aluminium body components intended for manufacturers of zero emissions vehicles aiming to tackle pollution levels on the streets of the UK.

Bringing production back

"At first, Hydro needed to outsource the CNC machining element as issues with their previously bought machinery meant they lacked the functionality to produce the parts themselves" recalls Mike Grogan, Addison regional sales manager. "Hydro began to use a local subcontracting company operating three MECAL KOSMOS machining centres which were ideal for producing the required parts. However, it soon became apparent that bringing the operation back in-house would be more beneficial in terms of turn-around time, overall cost and allow for greater control over the manufacturing process.

After the successful installation of the Kosmos machines, Hydro's production manager at the Bedwas plant was interested in setting up a single step automated production line, eliminating the need for their additional saws. After in-depth discussions, Hydro placed an order for the new 5-axis MC 302 GEOS MDT 8.6m CNC machining centre. Addison Saws then flew key members of the Hydro production team out to MECAL's factory in Italy to view the machine in action. Along with seeing the factory, the management team were reassured knowing that the MECAL software could handle the bespoke programmes required for complex parts.



The Mecal MC 305 Kosmos machining centre is equipped to automatically machine, drill, mill, slot and prep both aluminium and steel extrusion bars. Providing immense flexibility, it is also well suited to new product development, while its high levels of accuracy and repeatability ensure minimal waste.

Mecal MC 302 Geos-5 MDT machining centre is perfect for the high-speed machining of aluminium, steel, brass, copper and PVC materials. The 5-axis Geos can be used for machining slots, pockets, holes and custom shapes as well as end slotting, tapping, rigid tapping, drilling and flow drilling. The addition of a 400 mm saw blade enables the user to cut pieces to length before machining.

Valued technical support and guidance

Leading CNC engineer Ian Freeman from Addison Saws has been instrumental in the installation of all the Mecal machinery, which is now working to near-full capacity producing the 70 separate profiles required for one of Hydro's current contracts.

Hydro's production manager comments: "Addison have been a great help all round, from selecting the right machinery to assisting in the program writing and ensuring we get the very best out of all our machines. They even supplied an engineer to assist us with machining centres bought elsewhere. We are very pleased with our



choice; it's enabled us to tender and win several similar upcoming contracts with major names in the automotive industry."

Since installation, engineers from Hydro have flown out to Italy to receive one-on-one training from MECAL and this forms part of their strategy to ensure that the machines work to their full potential and that they have capable engineers in place who have in-depth knowledge and a full understanding of how they operate.

Looking to the future

In excess of 130 jobs will be created over the next five years at the recently re-opened Bedwas plant and their investment is backed by Welsh Government, who was keen to invigorate the area with the prospect of new jobs and increased industrial development. For more information, contact:

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Subcontractor invests in 5-axis machining centre

With more than half of its business in the oil and gas sector, subcontractor Numac Engineering has ordered a Hermle 5-axis, trunnion-type, mill-turn centre to strengthen its prismatic machining capability and at the same time add extra turning capacity.

Kingsbury, sole agent for the German machine builder, will install the Hermle C42UMT in the customer's Stalybridge factory this month. It will additionally allow the contract machinist to take on more complex work in the aerospace and motorsport sectors. A wide variety of metals is already machined on site, encompassing most grades of stainless steel as well as exotic materials including titanium and nickel alloys such as Hastelloy and Incoloy.

Numac's managing director Andy McLaren comments: "We have 4-axis horizontal-spindle and vertical-spindle machining centres here but are keen to add full 5-axis milling and drilling, both to increase the complexity of parts we can produce and to reduce the number of set-ups needed for 3+2 axis work.

"The torque table on the Hermle will cut the number of separate operations even

further on some of our mill-turned components, as we will be able to avoid a separate clamping on a lathe.

"We have a number of oil and gas parts earmarked for such a process improvement and estimate that typically the number of setups will be halved, resulting in major efficiency and productivity increases."

He added that he had spent 18 months researching 5-axis mill-turn centres available on the market and opted for the Hermle primarily due to its superior turning capability, the table having a maximum speed of 800 rpm and the ability to turn components with the trunnion positioned at any angle.

Other attributes of the C42UMT that Andy McLaren values are: its 800 x 800 x 550 mm working volume, which fits well with the maximum size of part machined by Numac; its 18,000 rpm HSK-T63 spindle, more than double the speed of other machines on the shop floor at Stalybridge; the tandem trunnion drive, extended tool capacity to 92 pockets and 10 m/s² acceleration to 60 m/min rapids.



The working area of a Hermle C42UMT of the type being supplied by Kingsbury to Numac Engineering

Kingsbury

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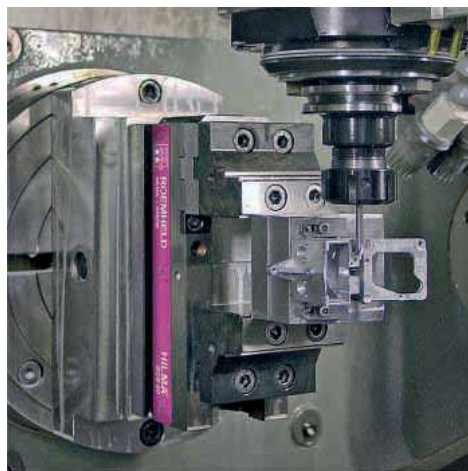
New Roemheld vices are ideal for 5-axis machining

New, compact workholding systems that are well suited to metal cutting operations on 5-axis machining centres have been introduced by Roemheld UK. They are manufactured by the German group's Hilma division in Hilchenbach.

The design of the fixed-jaw SCS vice is compact and allows good accessibility of tools to the component. This means that five-sided machining can be achieved without collision using short standard tools, lowering costs and improving workpiece accuracy due to the generation of less vibration.

Stability of the clamping systems and high retention force resulting from the use of a reversible jaw mean that there is no need to pre-stamp a workpiece before it is secured, even when it is clamped on just a few millimetres of material. Repeatability of positioning is to within ± 10 microns.

SCS workholding systems are of top precision, feature high stability and have comprehensive swarf protection, so are also



suitable for use in multi-pallet prismatic machining cells. Operation is either mechanical via a threaded spindle and torque wrench or hydraulic using a single-acting cylinder to produce the clamping pressure, with unclamping achieved by spring force.

A variety of base lengths up to 350 mm is

offered, with different clamping ranges to 300 mm, while clamping force is up to 40 kN at 100 Nm. An extensive range of hardened and ground jaws, as well as soft jaws, in 80 mm and 120 mm widths to suit the various vice models is available, as are customised versions in other lengths or with individual mounting holes including for zero-point clamping.

Roemheld is committed to researching and developing products designed to meet not only the demands and expectations of today's discerning buyer, but also emerging markets and applications. Through continued improvement of products and services, the Roemheld Group intends to remain an innovator at the forefront of technology providing 'All your workholding needs from a single source'.

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Rising from the ashes

DMG MORI helps P Patterns rebuild its business for long term success

A disastrous fire at P Patterns in Brierley Hill turned out to be the catalyst for a new and stronger company with some help from DMG MORI.

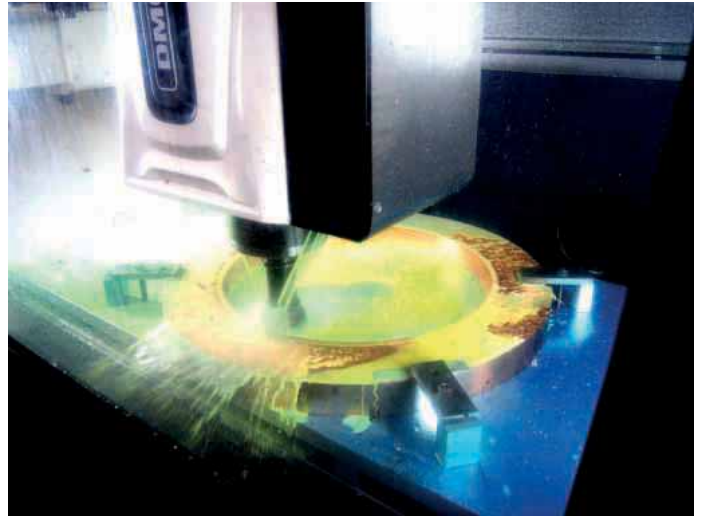
P Patterns produces medium to large patterns for the foundry industry in iron, copper beryllium and model board. The patterns are used for high volume parts, mainly in the rail, automotive and earthmoving industries for applications such as suspension parts and wheels which are ultimately delivered to major OEMs including Caterpillar and Scania. Although some of the patterns are for die casting, the majority are for sand casting in spheroidal graphite cast iron for highly stressed components.

In August 2018, Phil Hancox, managing director of P Patterns, had a call to tell him his factory was on fire. Rushing to the scene, he saw his life's work going up in smoke. Fortunately, nobody was hurt, but the building and the machinery were completely destroyed by a combination of water and fumes from the fire that ate into the metal of all his equipment.

Phil Hancox says: "We were well covered by insurance and we also had business interruption insurance which enabled us to keep all our employees on full pay while we set about rebuilding the company. We also owned the building next door, which was used for storage, so our first tasks were to reassure our customers and start putting the necessary power and services into the storage building so that we could get working again as soon as possible."



Prior to the fire, P Patterns had a DMG MORI 635, which they had had for eight years and which had been running continuously without a breakdown. Additionally, the company had a number of other machines including a machining centre with 1.5 m capacity. Phil Hancox adds, "The DMG MORI machine was very reliable, fast, accurate and produced a superior surface finish. Because we were so pleased with the machine, we decided to replace all our machining centres with DMG MORI equipment. Although this would cost us more than like for like replacement, we decided that this was an ideal time to make the extra investment which we judged to be definitely worthwhile for the long-term future of our business."



As soon as he had confirmation from his insurance company, he explained the urgency of the situation to DMG MORI and placed orders on 17th September for a CMX800V and a DMC1450V. The CMX800V arrived on 18th November and the DMC1450V in December. The first machine was up and running just nine weeks from order.

During the disruption, Phil Hancox used his contacts in the industry to provide continuity of manufacture for his customers, retaining their business for the future: "DMG MORI carried out pre installation checks, making sure that there was sufficient room to position the machines and that all the services were in place. The actual installation went very smoothly and was exactly on time."

As well as the reliability of the machines and the quality of the finish, P Patterns saw other benefits with standardised tooling and fixturing across its machines, which has considerably reduced its tooling and fixturing inventory. Both machines have Heidenhain controls, which again simplifies machine operation as they have 30 years of experience with the system.

Phil Hancox concludes: "We are taking delivery of a CMX1100V in the next few weeks, so our CNC machines will be consistent and DMG MORI throughout. We now have new faster, reliable and more accurate machinery which will last for at least 10 years. Additionally, the machines give us extra capacity to cover the large patterns we produce. Our customers have been impressed with the new machinery and the improved quality and we anticipate that this will lead to new customers and more business from our existing customers. The fire forced us to be resourceful in overcoming the challenges it presented and gave us the chance to turn a disaster into a positive outcome and build a stronger business as a result. DMG MORI's fast delivery times certainly were a big help."

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Some things are just meant to be!

When a leading mobile crusher machine manufacturer found out that Doosan manufactured a horizontal boring machine to its exact specification, it was game over.

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has recently supplied leading materials processing (MP) equipment manufacturer and solutions provider Terex Coalville, part of the Terex Corporation, with a new, large-capacity Doosan DBC160 horizontal boring machine. Up to 70 mobile crusher machines are manufactured at Terex's Coalville facility every month.

The DBC160 horizontal borer was delivered and installed at Terex's machine shop facility between July and October 2018 and is being used to machine high accuracy bores, holes and threads etc., in the fabricated sections of Terex's mobile crusher machines.

These sections are made from steel plate which are first Plasma cut and then welded together. It is these fabricated sections that are loaded into the Doosan DBC160 for machining. The weight of these fabricated sections varies according to the different type and size of crusher being produced. Different sections can typically weigh from six tonnes up to 30 tonnes.

Machining operations on the DBC160 can be relatively long and, such is the need to maintain productivity, that high removal rates are a definite requirement.

Over the last 12 years there has been something of a renaissance that has occurred at Terex's manufacturing facility in Coalville. The company has increased its headcount to 100 members of staff, with demand from around the world for its high-performance range of impact crusher, jaw crusher and cone crusher machines at an all-time high. However, the change in fortunes hasn't happened by chance.

Jason Toon, operations & facilities manager at Terex MP, explains: "Over the last 12 years we have been on a 'lean journey' and, because continuous improvement is not a finite destination, we are still on it. We have rigorously applied lean manufacturing principles and methods across our operations and are committed to driving out waste and inefficiency."

It is estimated by lean manufacturing aficionados that 60 percent of production activities in a typical manufacturing



The Doosan DBC160 installed at Terex is a powerful, rigidly-built horizontal boring machine capable of machining large, heavy and awkward-shaped workpieces

operation are wasteful and add no value for the customer.

"The introduction of lean manufacturing has helped galvanise and motivate the workforce," continues Jason Toon.

"It's had a dramatic and significant impact on quality and productivity levels and, not surprisingly, on the company's sales growth and profitability."

The increase in demand experienced by Terex for its mobile crusher machines was clearly 'good news' for the company, but it did highlight a capacity problem that would only get more acute if not addressed.

"We undertook a forensic examination into our existing machining capacity and capabilities, including an analysis of our weaknesses and where bottlenecks were occurring or could occur in the future," says Jason Toon. "It became clear that an investment in a new, large-capacity horizontal boring machine would satisfy our immediate and future machining requirements."

Terex had previously invested in a horizontal boring machine and it seemed likely that the new machine order would be placed with the same supplier, but it didn't turn out that way.



The company is certainly no stranger to investing in Doosan machine tools from Mills CNC. Since 2012 the company has invested in four new Doosan machining centres that include two large-capacity Mynx 7500/50 machines, as well as a Doosan Puma 400 (long-bed) lathe with driven tooling.

The Doosan machines are being used by Terex to machine specific crusher machine components in small batches.

Jason Toon says: "The machine tool specification we had drawn up, including the requirement that the machine needed to have a large 3 m Y-axis. We didn't realise at the time that the new Doosan DBC160 borer could be supplied with such a large Y-axis. However, when we found out that Mills could indeed supply us with such a machine, we were naturally interested."

As part of the purchase process, Mills

invited representatives from Terex to visit the Doosan factory in South Korea to see the DBC 160 machines being built and to see the results of a Factory Acceptance Test (FAT).

The performance of the DBC160, its cost, availability and the fact that it was backed by Mills CNC's 'best-in-class' after-sales services and technical support, were all key factors in ensuring the machine tool sale.

The specification of the machine was also of paramount importance. The DBC160 is a large-capacity, moving-column type borer equipped with a powerful, high-torque 160 mm diameter boring spindle (45 kW/2,000 rpm) that takes heavy-duty, roughing operations in its stride.

The machine has a rigid design and build. Such structural rigidity helps minimise vibration and maintain part accuracies and surface finishes.

The DBC160 can accommodate large workpieces (3,400 mm diameter/20 tonnes weight) on its rigidly-built B-axis rotary table and has X-, Y-, Z-axis travels of 4,000 mm x 3,000 mm x 1,600 mm.

Mills' projects team pulls out all the stops

Prior to the DBC 160 machine being delivered to Terex - significant pre-installation work was undertaken by Mills CNC's Projects Team at the Coalville facility in advance of the machine's arrival.

This work included digging out the existing floor and foundations of the machine shop, laying a new floor and foundations, replete with drainage systems and coolant channels, and creating new guarding.

The floor itself was dropped by 1 m to enable the machine to



operate at its full height and therefore at full capacity without it colliding with the overhead crane in the machine shop.

Jason Toon says: "It was an involved and complex installation, certainly with regards to pre-installation, but the Mills CNC engineers did a great job.

"We have been delighted with the DBC160 machine's performance and we cannot speak highly enough about Mills CNC's dedication and commitment, which have been first-class."

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EUROPA eturn VS lathes create a new standard for manual turning

RK International Machine Tools is turning to a new standard for manual lathes with the arrival of its EUROPA eturn VS range of gap bed centre lathes. Featuring eturn Energy Management Technology (EEMT), the eturn VS lathes help to reduce energy consumption, particularly at times when the machine is stood idle. The system constantly monitors the machine and, if a period of in-action is detected, puts the lathe into sleep mode, switching off all unnecessary power consumption. A simple push of a button brings the lathe back to full operational activity.

In addition to its environmental advantages, the EUROPA eturn range also packs an impressive specification, with an electronic variable speed spindle with Schneider frequency inverter ensuring optimum cutting performance. Transmission is via a Norton-type gearbox that delivers constant power and torque. Each machine in the range is also equipped with a Newall NMS300 2-axis digital readout for enhanced ease-of-use, while BISON was selected as a workholding partner allowing a 3-jaw scroll and 4-jaw independent chuck to be supplied as standard equipment.

There are eight machines in the range, starting with the compact Europa eturn VS330 with a 330 mm swing over the bed (510 mm in the gap) and either 750 mm or 1,000 mm between centre distance. Spindle speeds are totally variable between 40 and 2,500 revs/min with two gear ranges to allow constant torque. Longitudinal feed rates are between 0.02 and 1.04 mm/rev, which also accommodate the machining of a wide range of metric and imperial thread types.

The other machines in the Europe eturn range are the VS360, VS390, VS460, VS510, VS560, VS660 and VS760 with the number designating the swing over the bed. The larger machines in the range feature a three-range gearbox with maximum spindle speeds ranging from 2,500 revs/min down to 1,400 revs/min on the largest machine. Between centre distances across the range are from 750 mm through to 6,000 mm depending on which machine is chosen. All the lathes feature a hardened and ground bed, while the headstock is equipped with

high performance NSK heavy-duty taper roller bearings that will provide years of trouble-free running and DIN8605 toolroom accuracy standards.

"The addition of the eturn range to our Europa brand further enhances the offering from RK International Machine Tools while the EEMT energy saving features will be a big bonus to customers who will typically be education establishments, toolrooms and small to medium production facilities, where machines are often left standing while other tasks are undertaken. The variety of machine sizes and bed lengths also means that there is a Europa eturn VS lathe for virtually every application," says Simon Rood, director and general manager. RK International Machine Tools.

Europa eturn machines are now available



The eturn range of gap-bed centre lathes from RK International Machine Tools feature several energy saving technologies, in addition to an impressive machine specification



for demonstration at RK International Machine Tools' showroom facility in Erith, Kent from the summer of 2019 for delivery anywhere in the UK & Ireland.

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Citizen's new 32 mm sliding head lathes have LFV software

Two new sliding-headstock, twin-spindle, turn-milling centres of 32 mm bar capacity have been added to Citizen Machinery's Cincom programme. The L32-X LFV and L32-XII LFV machines both feature the firm's patented, Low Frequency Vibration software in the control's operating system that acts in two axes to convert what would normally be long, stringy swarf into short, more manageable chips. It is particularly helpful when machining stainless steels, plastics and copper and can be applied not only to turning but also to grooving, thread cutting and drilling.

Unlike the two other L32 bar autos in the range, the 8-axis L32-X adds a Y2 axis to the Z2 axis on the back tool post, as does the 9-axis L32-XII, which additionally has +90 / -45 degree B-axis swivel on the front gang tool post, whose rotary tools can work at either spindle to produce angled holes. Both machines are available in 35 mm and 38 mm bar diameter versions and all may be used with or without the guide bush to suit the application.

The new L32 design is modular, enabling

a user to optimise their manufacturing costs by selecting functions that achieve the ideal machine configuration for their needs, while retaining the option of being able to add extra functionality later. A workpiece conveyor is standard equipment. Control is by the Industry 4.0-ready Mitsubishi 800 CNC system, which allows up to three tools to be in cut at the same time.

Up to 44 tools for front, back and cross machining are available in the -X model, while the B-axis -XII version accepts four fewer. Speed range of the 3.7 / 7.5 kW main spindle and 2.2 / 3.7 kW counter spindle is up to 8,000 rpm. Both have a C-axis for use in conjunction with driven tool stations in the three tool carriers. Fast acceleration of tool



rotation up to 6,000 rpm minimises cycle times. Rapid traverse in the linear axes is 32 m/min except in Y2, which moves at 24 m/min.

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Leaders in industrial process fluids combine to form Quaker Houghton



Quaker Chemical Corporation and Houghton International have combined to create Quaker Houghton, the global leader in industrial process fluids to the primary metals and metalworking markets. Along with the new name, the company has revealed a new logo and brand representing the combined companies. The company will continue to be listed on the New York Stock Exchange and trade under the "KWR" ticker symbol.

A strategic combination is formed

The combined \$1.6 billion revenue company employs 4,000 associates serving 15,000 customers worldwide. Quaker was founded in 1918 and Houghton in 1865.

"We are rooted in companies commonly acknowledged as authorities in industrial fluids and valued experts in customer processes," says Michael F. Barry, chairman, chief executive officer, and president of the new company, who previously served Quaker Chemical in similar capacities. He continues: "Our similar cultures and values, combined with the talent and resources we bring to Quaker Houghton, create exciting opportunities to deliver innovative solutions that will help our customers' operations run even more efficiently and effectively."

The company's combined breadth of product and service offerings can be found in end markets such as aerospace, aluminum, automotive, machinery, can manufacturing, industrial parts manufacturing, mining, offshore, steel, and tube and pipe industries.

With its expanded products and services portfolio, the company expects that cross-selling opportunities will facilitate continued above-market growth. Specific

products the company offers include metal cutting and forming fluids, corrosion protection fluids, specialty hydraulic fluids, and steel and aluminum rolling oils. In addition, legacy-Houghton customers will benefit from Quaker's strength in specialty greases, high-pressure die casting, mining specialties, surface treatment and bio-based lubricants, while legacy-Quaker customers will now have access to Houghton's heat treatment quenchants, offshore hydraulic fluids, metal finishing products and a broader metal removal fluids portfolio.

"Our foundation will be the same customer-intimate operating model that has been key to the success of our customers," says Michael F. Barry. "Moving forward together, we will draw upon our rich history and shared expertise to enhance our product and service offerings and continue to deliver value-added service expertise to our customers."

The company has utilized a top consulting firm over the past two years to help with its integration planning efforts and they will continue to assist the company during the integration.

In addition to cost synergies, the company expects that its growth strategy will create additional value over time. Revenue-based synergies, such as cross-selling, will be an important contributor to growth going forward. The legacy product portfolios of both Quaker and Houghton can now be offered to the combined, complementary customer base, where 14,000 of the 15,000 total customers are unique to one company or the other. The company believes the revenue synergies are achievable and will be significant over time, beginning after year one. In the first year, the company's focus

will be to maintain service levels for its customers and ensure no supply chain disruptions, while successfully executing its integration plans. In year two, the revenue synergies will begin to be visible as the company expects to grow above the market by two percent to four percent as it has in the past. The company also expects to continue to grow through acquisitions which remain part of its core growth strategy.

In the short term, the company will focus on paying down debt, but will continue to consider smaller acquisitions that can create value. Both Quaker and Houghton have long histories of building value through acquisitions.

"Today is a historic day for our businesses," said Michael F. Barry. "We are finally beginning our journey as Quaker Houghton and are now the leading global supplier of industrial process fluids to the metals and metalworking markets. Two years from now, we expect to have an enterprise that will be integrated and generating over \$300 million of adjusted EBITDA on a going-forward basis. More importantly, we will be well-positioned to continue to achieve above-market growth organically driven by our differentiated business model and the cross-selling opportunities created by our combination."

"While we are certainly a leader in our chosen markets, there is significant growth potential for this new company. We estimate that Quaker Houghton's revenue of \$1.6 billion represents less than 20 percent market share in a more than ten-billion dollar addressable market. The near doubling of the size of the company today gives us greater scale to invest in new technologies and make future acquisitions. We are very excited about the future and the opportunities that lie ahead for Quaker Houghton and what it means for our customers, our employees, and our shareholders."

Quaker Houghton
www.quakerhoughton.com

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Two world leaders in **industrial process fluids**, Quaker Chemical and Houghton International, have come together as one company to keep our metalworking customers ahead in a changing world.

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quakerhoughton.com



New coolant is made for changing machining processes and demanding materials

Innovative rhenus TU 446 has no hazard symbols and offers users easy maintenance

Modern manufacturing means consistently achieving the best results even with changing machining processes and demanding materials. This makes it essential to have the right coolant. As a lubricant specialist, Rhenus Lub always approaches product development from the user's perspective, because this is the only way to identify the requirements and develop suitable solutions. The company's latest offering, rhenus TU 446 is a water-miscible coolant combining everything that is essential to users in modern industry: high flexibility in terms of the range of machined parts and materials, and easy maintenance in operation. As well as being extremely user-friendly, the innovative formulation actively helps to reduce costs.



A universal coolant for improved performance and ease-of-use

Milling steel today, drilling aluminium tomorrow: rhenus TU 446 is ideal for all manufacturing companies which use varying processes and different materials on a daily basis. It is also suitable for the efficient processing of non-ferrous metals and other materials susceptible to staining. The high-quality coolant is optimally adapted to flexible manufacturing while offering very high performance, a very profitable combination that is proving extremely popular with users.

Daniele Kleinmann, head of product management for coolants, explains: "With rhenus TU 446, we're demonstrating that versatility and high performance really can

go hand in hand. Users don't need to compromise on any feature, and with our coolant they also benefit from very low maintenance requirements. Because it has a class 1 low water hazard, classification of storage and handling are also a lot easier."

The special formulation of rhenus TU 446 not only offers the best possible starting point for clean machines and residue-free workpieces, but also improves output.

"This reliable, versatile product also meets high environmental and safety standards, two of the most important requirements of our times. With no GHS pictograms, SVHC ingredients or formaldehyde depots, rhenus TU 446 is an optimum alternative to products based on secondary amines. This means there are no restrictions due to legal requirements and the product is simply a safer option," he adds.

Effective cost optimiser

As well as being a modern and highly versatile coolant, rhenus TU 446 is an effective cost optimiser, as Meinhard Kiehl, marketing director for product management, explains: "Being in close contact with users in industry, we tend to find that they are often only concerned about the cost of the

coolant itself. But this is too narrow a perspective. A high-quality coolant like rhenus TU 446 has a positive impact on other cost factors: the low-maintenance use of our new universal product extends the change intervals of tools and machines and, because it has a low classification of water hazard class 1, it is also easy to store. This actively helps users to reduce costs."

The high-quality coolant has a broad range of applications. Suitable for titanium, steel, stainless steel, non-ferrous metals and cast iron, its specific formulation also makes it the ideal machining fluid for especially stain-prone materials such as copper and aluminium. The product minimises the risk of corrosion and discolouration and has also been successfully tested for compatibility with polyurethanes and paints. As well as being suitable for use with low water hardnesses, the coolant offers good long-term stability. This makes rhenus TU 446 a truly user-friendly product that keeps maintenance requirements low while maximising flexibility.

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Coolant switch improves odour, cleanliness and usage rates

Since replacing its previous coolant with TRIM® MicroSol® 585XT from Master Fluid Solutions, McAuley Engineering has not only solved previous issues surrounding bad odour and poor cleanliness but reduced usage considerably. Where a single IBC of the company's previous coolant would only last six weeks, one IBC of Microsol 585XT is lasting for an impressive four months.

McAuley Engineering, based in Ballymoney, Northern Ireland, was founded in 1997 and built on a foundation of integrity and product quality. The company has continually invested in equipment, processes and people, and is today one of the largest employers in the region.

"Although we weren't particularly looking to change our coolant, we were aware of the strong odour being created in the machine shop," explains Dale Kirkwood, ISO coordinator at McAuley Engineering. "Furthermore, the coolant was leaving heavy oily residues on the windows of our machine tools, which was making it difficult for operators to see the cutting zone."

With these concerns in mind, the company spoke with its tooling supplier,

Advanced Cutting Tools (ACT), which is a premier distributor of Master Fluid Solutions' products, to see if a solution could be found.

Based on Master Fluid's recommendation, McAuley Engineering agreed to switch the coolant in one of its machines to TRIM MicroSol 585XT and monitor performance over a four-week period. Materials being machined at the time of the trial included aluminium, steel and some titanium, typically in the form of either billets or castings. The running concentration for TRIM MicroSol was eight percent, while top up was two percent.

TRIM MicroSol 585XT, which holds approvals with major aerospace companies, provides the performance of a premium soluble oil with respect to tool life and minimising residue on machines, parts and workholding equipment. This cutting fluid concentrate is a high lubrication, semi-synthetic micro-emulsion that provides excellent cooling and mechanical lubrication without chlorinated or sulphurised EP additives. In the production of aerospace



parts this factor is particularly important as materials such as titanium alloys are poor thermal conductors. The heat generated during the cutting process can therefore dull cutting tools very quickly, so good lubrication is essential to extending tool life and reducing process costs.

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Coolant saving technology to be showcased at Inspiration through Innovation 2019



our work at Inspiration through Innovation 2019 and throughout the year in our Technical Centre. At this year's event, we are specifically focusing on the aerospace industry, where the need for continuous improvement and cost reductions is an ongoing challenge. Working with Wogaard opens another window through which we can provide additional value to our customers, while complying with health and safety and environmental regulations."



If you had to name some of the top concerns for manufacturers right now, cutting costs, reducing waste and decreasing environmental impact would be at the top of the list. A solution which enables companies to achieve all of these in one is set to be showcased at the Seco Tools Inspiration through Innovation event in Alcester on 9th October. Industry innovator, Wogaard, will be demonstrating its award-winning Coolant Saver technology at the prestigious event, where machining is back at the heart of innovation.

Delegates will be able to view a working model of Wogaard's Coolant Saver device and see first-hand how it reclaims fresh coolant rather than allowing it to be carried off with waste materials. Not only does the technology provide up to 50 percent coolant savings and up to 90 percent coolant disposal savings, it also enables companies to better address their environmental responsibilities by reducing their carbon footprint through reducing wastage and reprocessing.

Visitors to Inspiration through Innovation 2019 will also learn about how Wogaard's technology enhances overall facility health and safety, reduces the demands of coolant and swarf handling as well as providing higher swarf value.

Organised by Seco Tools, at its state-of-the-art Technology Centre in Alcester, Warwickshire, the Inspiration

through Innovation event, held annually in collaboration with its technical partners, is a customer-focused event that demonstrates to visitors the improvements in productivity and performance that can be achieved by integrating teams, embracing technology and aiming high and beyond current standards.

This is very much what Wogaard's technology is about too and why it is trusted by companies like Renishaw, Mettis Aerospace and Quaker Houghton. It will be the third time that Wogaard has participated at the event.

Wogaard managing director Jason Hutt says: "Our mission is to support manufacturing industry, especially when machining is at its core. We're all about reusing, recycling and reducing the usage and cost of neat oil and coolant so it's great to be able to share this at Inspiration through Innovation 2019.

It's a unique event and I can only see it becoming more successful every year. We look forward to catching up with clients and making new connections through these two magnificent days."

The company enjoys a long-standing technical partnership with Seco Tools, one of the world's largest providers of comprehensive metal cutting solutions for milling, stationary tools, hole making and tooling systems.

Dave Magnall, Innovation Partnership manager at Seco Tools (UK), comments: "We appreciate having Wogaard support



Saving costs, reducing waste and addressing environmental responsibilities is something every manufacturer wants to achieve. A visit to Wogaard's demonstration at Inspiration through Innovation 2019 is the ideal opportunity to discover how to do that more easily and affordably.

Wogaard delivers products focusing on cost-cutting and optimisation for the manufacturing industry. Primary customers are CNC machine shops, of all sizes, that are constantly looking to improve their competitive edge and reduce any impact on the environment from day-to-day manufacturing processes.

To learn more about Wogaard, contact:

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Hangsterfer's Laboratories oil free coolant, Crystal Cut 465 now available in the UK

Although perhaps not the first name that comes to mind when considering a new metal working coolant, Hangsterfer's is a well-established metalworking fluid manufacturer. Founded by Dr William Hangsterfer in New Jersey in 1937, the factory is at the same location today, still owned and operated by the second and third generation of his family. His commitment to produce technically advanced, safe as possible fluids has meant the Hangsterfer's brand has been at the forefront of technology and safety.

Around 15 years ago, the company introduced Crystal Cut 465 to the market in the USA. This quickly found favour with customers looking for a coolant that provided better component visibility during machining, but still capable of competing with conventional emulsions with regard to cutting performance. Most synthetic coolants are primarily designed for grinding whereas Crystal Cut 465 is targeted at

cutting. Now available in the UK through Hangsterfer's distributor, MacInnes Tooling, Crystal Cut 465 is an oil free coolant designed using a unique chain link synthetic technology with molecularly modified components to provide a variety of physical and chemical protection over a broad range of conditions. When used with DI or demineralised water it mixes to form a colourless emulsion. Naturally if used with water containing minerals, the mix becomes cloudier.

Crystal Cut 465 is suitable for machining and grinding a wide range of materials including even difficult to machine alloys and can accommodate mix ratios from three percent through to 20 percent. Hangsterfer's classifies the 465 as bioproof. With no tank side biocides required, it rejects tramp oil and will give customers long sump life.

As with all Hangsterfer's coolants Crystal Cut 465 is free from boron/boric acid, free



Crystal Cut 465 at a 10 percent mix in de-ionised water

from formaldehyde and free from secondary amines.

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Soluble metalworking fluid is environmentally friendly

A leading lubricant manufacturer has created a unique patent-pending soluble metalworking fluid as a practical alternative to fluids which contain formalin donor biocides.

FUCHS Lubricants UK PLC has released FUCHS ECOCOOOL ULTRA-MOTIVE, which the company describes as the 'greatest development in soluble metalworking fluids for a generation'.

As well as overcoming difficult legislative issues, the technology has been proven to increase tool life by up to one-and-a-half times. Historically, the metalworking industry has relied on traditional formalin donor biocide technology to offer equipment the best possible sump life.

Formaldehyde is a chemical compound which occurs naturally in the environment as a by-product of metabolic processes in humans, animals and through the natural decay process of plant species. It is even detectable in human breath at low levels.

For some time, formaldehyde itself has been classified as a category 1B carcinogen. New legislation now affects certain formalin donor biocides. Under the recent update to CLP regulation, ATP (Adaptation to Technical Progress, review May 4th 2017), any product or treated article which contains certain formalin donor biocides (to protect the function of the product) will need to be labelled as a category 1B carcinogen. Under the changes planned to the labelling of certain chemicals, formalin donating agents have been re-classified according to their total potential to donate formaldehyde and not through actual measurement in use.

Examples of the biocides affected include methylene bis-morpholine (MBM) and methylene bis(5-methylloxazolidine) (MBO). Changes to labelling are required to meet

the new CLP (Classification, Labelling & Packaging) regulations adopted by the European Union. As a result, through no changes in product formulation, certain products will carry additional hazard labelling.

Paul Tierney, technical product manager at FUCHS Lubricants, says: "Building on the unique patent-pending 'GLOBAL' technology, FUCHS ECOCOOOL ULTRA-MOTIVE soluble metalworking fluid has been designed to address the future global environmental and health and safety requirements for water miscible metalworking fluids.

"The innovative platform chemistry has been developed to provide excellent levels of lubricity, cooling and corrosion protection whilst being free of formalin-containing biocide, boron and other SVHC listed components.

"As a result, FUCHS ECOCOOOL ULTRA-MOTIVE is not affected by the new CLP labelling changes and has an enviable position in the industry offering our most sustainable solution for the widest possible range of applications."

In developing ECOCOOOL ULTRA-MOTIVE, FUCHS chemists successfully formulated a premium semi-synthetic soluble metalworking fluid, specifically designed to serve the demands encountered in the automotive industry.

Performance has been proven over a wide variety of materials, including cast iron, stainless, Duplex and Super Duplex steels, along with the widely used automotive aluminium alloys. Performance optimisation during the research and development stage included extensive in-house testing using FUCHS' CNC machine tool. The ability to develop products in such a way is integral to the success of all FUCHS Lubricants industrial products.

Paul Tierney adds: "FUCHS ECOCOOOL ULTRA-MOTIVE has been benchmarked against many competitors and customers have reported up to 43 percent reduction in tooling costs when using the latest ECOCOOOL 'GLOBAL' platform with existing tooling. Greater savings can be realised when tools are optimised for the process. In tooling studies, tool life



increases of up to 150 percent have been recorded.

"In the FUCHS UK R&D laboratory, cutting speeds have been increased to provide real benefits in productivity whilst maintaining excellent tool life. The rate of metal removal can also be increased. Results have indicated a 16 percent increase in cutting speed is possible when matching the tool life of our previous class leading FUCHS ECOCOOOL ULTRALIFE A."

"Since its launch, customers have reported tool cost savings, improved cleanliness, excellent sump life and greatly improved foam suppression during high pressure machining," says Paul Tierney. "This ability to counteract foam formation has been vital in securing accounts where problematic machining processes placed extra demands on coolant management."

FUCHS ECOCOOOL ULTRA-MOTIVE contains a unique lubricity package that makes it especially effective for stainless steel, aluminium and hard alloy machining. Stainless steel milling and drilling applications show dramatic improvements in tool life and surface finish. It is the ultimate 'next generation' water miscible coolant and employs raw materials that are intrinsically robust and provide long sump life. The emulsification system produces a tight stable emulsion that effectively tolerates tramp oils without producing sticky deposits or residues.

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New range of energy efficient hydraulic oils

Independent British oil blender, Millers Oils has launched Millmax EE, a new range of energy efficient hydraulic oils that offers a reduction in energy consumption of up to 10 percent for plastic moulders.

With growing environmental awareness in the industry, as well as ever increasing pressures for efficiency and cost reduction, Millmax EE is an ideal product for manufacturers looking to reduce energy consumption, especially those working towards ISO 50001 and ISO 14001 energy and environmental management standards.

Millmax EE uses Dynavis® technology, developed by world leading speciality chemical company, Evonik, to optimise its viscometric properties. Millers Oils industrial product manager, Louise Holt, explains:

“Viscosity index, or the tendency of a fluid’s viscosity to change with temperature, is a key property for hydraulic oils. Fluids with constant viscosity over the operating temperature range of the system ensure greater efficiency and lower energy consumption. Dynavis has been proven to reduce energy usage in injection moulding

applications by up to 10 percent, so by combining this technology with our high quality base oils and additives, as well as our industry expertise, we are able to offer tangible results to our customers in the plastic moulding industry.”

As well as providing energy savings, Millmax EE also shows outstanding oxidation stability, more than double that of the industry standard hydraulic oil2, which extends oil drain intervals, and reduces oil consumption and downtime.

Millmax EE is available in ISO 32, 46 and 68 viscosities as well as zinc-free formulations for applications where ashless product is specified.

Millers Oils is a leading British independent blender of oils with over 130 years’ experience supplying lubrication solutions to manufacturing industries. Millers Oils works with original equipment manufacturers to supply and fill high quality hydraulic oil for injection, blow and compression moulding machines, as well as offering a range of bespoke services.

Millers-Xtra services include oil sampling for



Mineral based HM hydraulic oil (ISO 11158 HM, DIN 51524 part 2)

preventative maintenance, oil filtration to increase drain intervals, machine clean outs, and oil changes.

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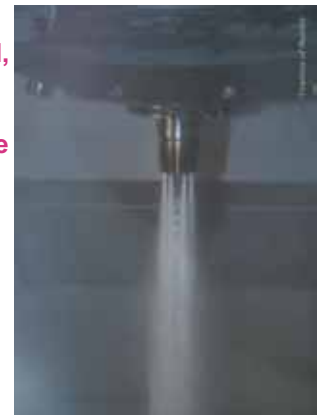
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Protect your machines with Kraft & Bauer

New automatic bottle weighing systems

Kraft & Bauer, whose automatic fire extinguishing systems are fitted to all kinds of machine tools, offers a complete range of systems from small 5 kg CO₂ based models to protect the smallest of machines up to huge multi cylinder variants having multiple 50 kg bottles.

One popular option is to have the CO₂ or argon gas cylinders contained within its own stand-alone cabinet that can be bolted to the factory floor and/or placed directly against a machine. These may be optionally equipped in the case of using CO₂, as the fire extinguishing media, with automatic weighing systems. These monitor the weight of the CO₂ cylinder and, in case it is empty, will not allow the machine to be run, thus providing added protection.

From its base in Coventry, Kraft & Bauer UK offers a full installation, retrofit and service facility for all Kraft & Bauer fire extinguishing systems. These must be checked at least annually by a qualified technician and signed off for companies insurance purposes. In the event of an incident, if there is not an annual service certificate in place then it is likely that any insurance claim will be declined.

It is mandatory to have fire extinguishing systems fitted to machine tools that provide some form of a fire risk. These are generally acknowledged as any machine that works with an oil-based coolant, ie. most grinding machines and turning machines and any



machine that causes a spark such as an EDM machine or laser machine. Engineering manufacturing companies must have documents for risk assessments in place and these need to highlight risks such as fires on machine tools. Companies must act using mitigating measures to overcome those risks. In the case where machines are run automatically, fully automatic fire systems need to be used that can react in seconds to put fires out.

Kraft & Bauer UK, whose fire extinguishing systems protect many hundreds of machines here in the UK, has expanded further with the addition to its fleet of a larger long bed van that doubles as a mobile workshop. A further service engineer has also been employed and



additional stock has been added to both of its storage facilities in Coventry and in Cork.

As more and more new machines are fitted with Kraft & Bauer's systems, naturally the global annual servicing of those systems increases. Kraft & Bauer notes that partly due to insurance companies being ever more vigilant and refusing insurance for machinery that's not adequately protected against fire risks, the retrofit market is driving many sales here in the UK and in Eire.

Louise Boraston, MD at Kraft & Bauer, who has been championing fire protection on machine tools for a number of years now, is naturally pleased to see the increases in sales but stresses that its far more satisfying to see sales due to companies understanding the importance of fire protection and acting responsibly rather than only reacting to fire incidents that have sadly resulted in the loss of machines and therefore production.

Kraft & Bauer urges those using all kinds of machine tools to understand the need to protect their workers and machines from the risks of fire. It points out that in the event of a machine being damaged and put out of action the replacement costs will almost certainly not be covered by any insurance policy unless a fire system has been fitted to it. Also, it should be understood, that even if end users are eventually successful in making a claim, it can take many months and then several more months to take delivery of replacement machines and very few end-customers will wait for production to recommence. Most will likely simply go elsewhere and therefore important contracts can be lost, in some cases, forever.

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Safety at work – how can machine tools and systems operate safely and efficiently?

by Michael Scalet, Industry Management Machine Tools, Leuze electronic GmbH + Co. KG



Michael Scalet, Industry Management Machine Tools, Leuze electronic GmbH + Co. KG

For a while now, sensors are not only a matter of process control. Today one of their primary tasks is to link processes together. With its extensive range of Safety@work products, Leuze electronic optimises collaboration between man and machine: sensor and control systems, where solutions like the RSL 400 safety laser scanner can be integrated intelligently into the processes performed by machines and safeguard these machines in a reliable and tamperproof manner. At the same time, the processes are structured efficiently and cost-effectively.

Machining workpieces

In machining centres, parts of various materials are machined, turned, and drilled. The prerequisite for processing workpieces in complex machining centres with a high degree of precision is having the right tool available for each work step. In addition to checking whether the tool is present and identifying it, the drill or milling cutter must also be monitored for tool breakage. Inductive switches or camera-based code readers clearly identify whether the correct tool is mounted for the respective processing step. Focused laser photo-electric sensors can, thanks to their very small light spot, reliably check whether even

the smallest drills or milling cutters are intact.

Increased level of automation

Industrial robots, which can perform a large number of swivel and gripping movements in a very short period of time, are often used for automated loading and unloading of machine tools. Their movement zones must be reliably protected against access over a large area. Before a robot picks up a part, the part must be uniquely identified to ensure that the correct processing step is carried out. This is done using the DCR 200i camera-based code reader. The DCR 200i is a reader used to detect and identify Data Matrix codes. The fast imager, integrated high-performance LED illumination, as well as high resolution in combination with a very high depth of field guarantees reliable decoding, even with fast processes and high object speeds.

Safety-related monitoring of machines and systems

Safety laser scanners such as the RSL 400 from Leuze electronic are used for the safety-related monitoring of areas in and around machines and systems. A maximum operating range, robust operation and

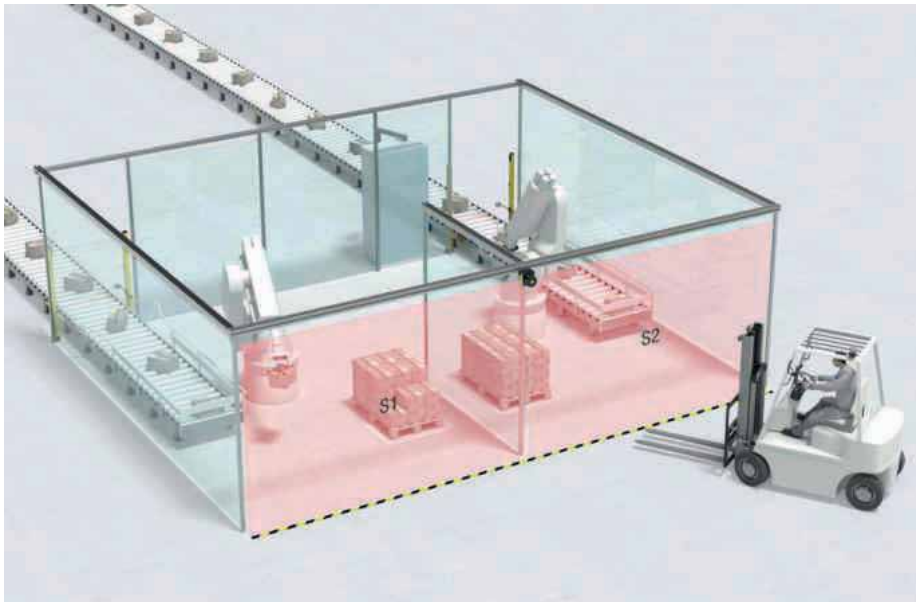
simple handling are crucial here. The simultaneous monitoring of four protective fields means the working area can be split up and the speed safely reduced.

In future, an important aspect in addition to the automated loading and unloading of machine tools will above all be the linking together of multiple machine tools in combination with automated production processes. This includes, for example, storage systems that optimise material flow, but also a wide variety of transport equipment such as linear gantries, pallet handling systems and conveyor systems, which all increase the level of automation considerably. For the safeguarding of large access points, safety laser scanners with vertical alignment of the protective field are used, e.g. to detect vehicles and persons. The RSL 400 safety laser scanner provides a solution for such applications. Its large operating range of 8.25 m allows large areas to be monitored. With two parallel protective fields and two integrated safety-related switching outputs, only one RSL 400 safety laser scanner can also monitor two stations independently of one another.

A further option is safeguarding using multiple light beam safety devices. These



RSL 400: safety-related monitoring of robot working areas



Complete safeguarding of two stations with just one safety laser scanner

devices provide a greater operating range and therefore an efficient solution for safeguarding access points over long distances of up to 70 m, while even "around the corner" solutions with multiple mirror columns are possible. Intelligent products such as the MLD 500 safety light curtain have an integrated laser alignment aid for time-saving and cost-effective alignment. Simple configuration by means of wiring and integrated indicator lights for status display are possible, even over long distances.

Different safeguarding options are available depending on the respective requirements and application. A comprehensive range of products helps in choosing the best possible solutions to ensure safety at work as well as optimising collaboration between man and machine.

In-house logistics with automated guided vehicles (AGVs)

An AGV, which moves autonomously and



flexibly in space, transports blanks into the working area of the robot or machine tool. On completion of the production process,

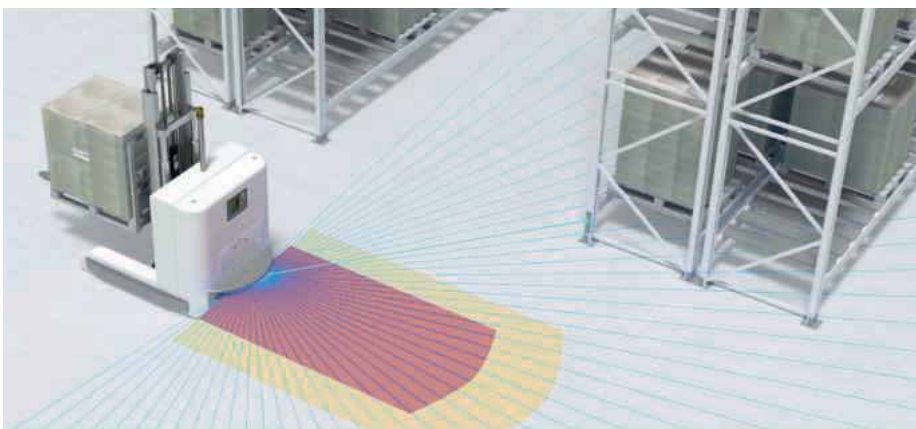
the machined work pieces are collected again. The transportation path of the AGVs must be safeguarded with safety sensors which monitor the presence of persons and objects. An important consideration here is the flexible adaptation of the protective fields to the movement situation and the different loads. In the case of the triangulation principle, an AGV must be equipped with two different scanners.

Unlike the contour navigation principle, just one scanner is needed for safeguarding and navigation. This means that safeguarding and data capture for navigation requires one single safety laser scanner. In other words, the scanner simultaneously also provides the measurement data needed for navigation. In addition to that, the measurement values have an extremely high angular resolution

and accuracy. This is important to precisely determine the position of the AGV. The RSL 400 safety laser scanner enables such a combined solution.

The safety laser scanner is available in various models. The extensive range of scanners from Leuze electronic includes a total of nine functional variants, three of which with data output for AGV navigation. All variants are available for the four operating ranges of 3.0, 4.5, 6.25, and 8.25 metres. Models with PROFI-safe/PROFINET interfaces are also available.

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Cleared for take off



Seco Tools has announced that its annual and ever-popular 'Inspiration through Innovation' advanced manufacturing best-practice event will take place on Wednesday 9th and Thursday 10th October at its Technology Centre in Alcester – and that, this year, the event will be focused exclusively on the aerospace segment.

Now in its fifth year, Inspiration through Innovation has become a 'must attend' event for UK and Irish component manufacturers looking to find out more about the latest innovative technology solutions in the market. More recently, the event has been used by Seco to highlight and demonstrate the power of positive partnerships and the benefits available to component manufacturers from adopting collaborative approaches to problem solving.

This year's Inspiration through Innovation event has been designed with the same objectives but with a specific focus on aerospace component manufacturing.

Mike Fleming, strategic marketing, products & services manager for Seco Tools (UK) says: "We review Inspiration through Innovation every year and make changes to its content and structure to increase its appeal and relevance. This year, we have made the strategic decision to focus on one industry segment."

The aerospace rationale

With the economy facing a period of uncertainty, the UK will rely heavily on its most successful industries to provide growth, jobs and innovation. The UK has the second largest aerospace sector in the world, after the US, with a turnover of £31 billion last year, including £27 billion in exports, representing a 40 percent increase since 2010.

Over the next two decades, the number of aircraft needed worldwide is expected to grow by an average of 4.8 percent per year, with demand for more than 39,000 new aircraft worth \$5.9 trillion being estimated.

Mike Fleming continues: "From a manufacturing perspective, the aerospace

segment is characterised by constant innovation, specifically in the use and application of new materials, the design and implementation of challenging machining and manufacturing processes and the ingenious ways the industry improves quality and safety and reduces costs and environmental impacts.

"Aerospace is a global industry with high growth potential that relies on innovation and one where we, and our Technical Partners, have considerable experience and expertise. Taking all this into account it is clear why aerospace was selected as the focus for this year's event."

The 2019 Event: machining demonstrations

At Inspiration through Innovation 2019, there are 30 Technical Partners taking part in eight aerospace machining demonstrations.

The demonstrations taking place on both days involve the machining of real components or, in the case of large components like aero-engine casings, the machining of real or look-alike features like holes, external bosses and flanges.

Specific components being machined include blisks, discs, landing gear, structural components (ribs) and interior cabin (seating) parts.

Mike Fleming comments: "The parts being machined are all challenging. They are made from difficult-to-machine materials that include Waspalloy, titanium, Heat Resistant Super Alloys (HRSAs) and Carbon Fibre Reinforced Plastic (CFRP), and they are machined to meet high accuracy and surface finish requirements."

All eight machining demonstrations are designed by, and involve, a number of Technical Partners, for example machine tool builders, CAD/CAM specialists, and tooling, workholding, cutting fluid, metrology and automation suppliers.

They demonstrate the productivity gains and cost-efficiencies that can be achieved through working in collaboration.

The 2019 Event: seminar programme
There are eight leading-edge seminars planned for the two-day event, each one delivered by a recognised industry-expert

and each focused on a relevant aerospace manufacturing and/or machining issue.

The Seminar Programme is currently being developed and details of all seminars including titles, speakers and synopses will be uploaded on the Inspiration through Innovation event landing page

www.secotools.com/iti

To sum up, Inspiration through Innovation 2019 is focused on the future and is aimed at aerospace component manufacturers looking to get out more from their machining processes, their systems and their people. The emphasis of the event reflects Seco's ethos that collaborative approaches to problem-solving and sharing best practice with customers deliver truly inspirational and innovative solutions.

Mike Fleming concludes: "The focus for the 2019 event is on creating something new, different and memorable in the



aerospace sector. Judging by the diversity and complexity of the machining demonstrations and the content and style of the seminars, I am confident that we will achieve these objectives."

Event details

The event is free to visitors, and doors open on both days at 09.00 closing at 19.00 on the 9th October and 16.00 on the 10th October.

Manufacturers wishing to attend Seco's Inspiration through Innovation 2019 event can register by visiting

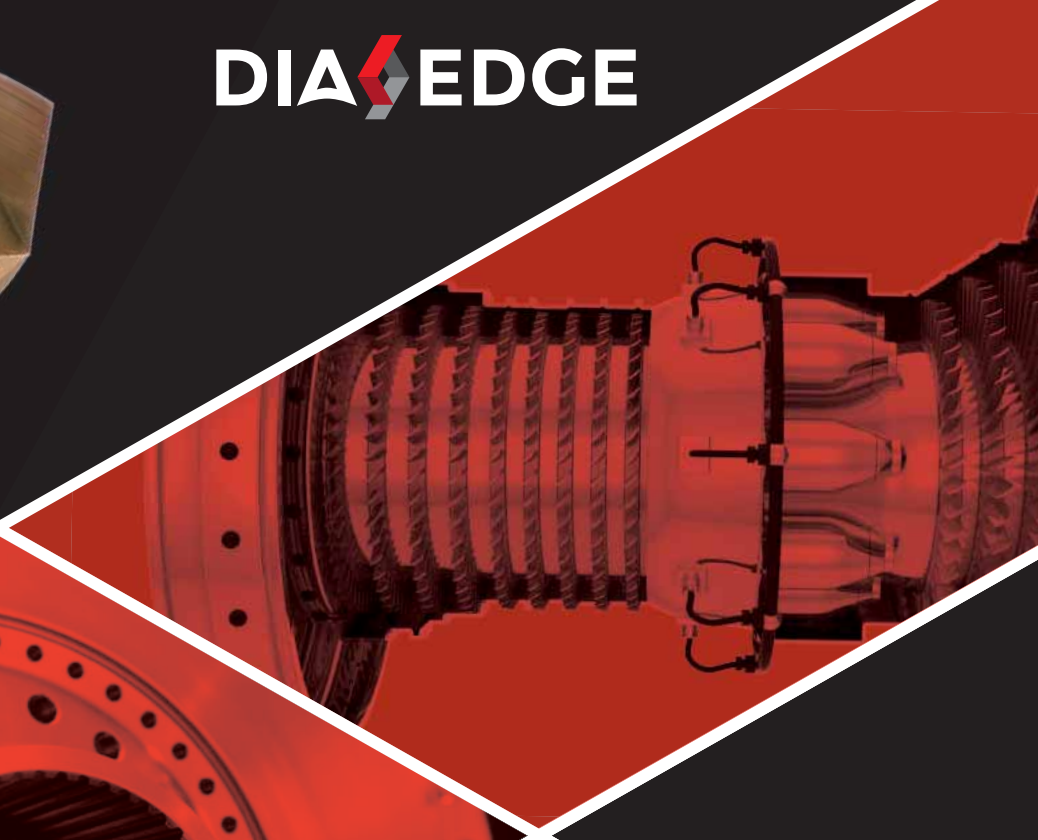
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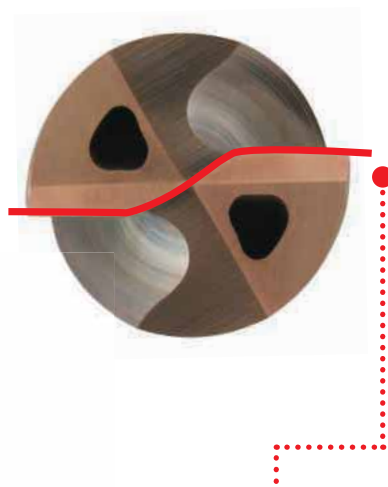
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Floyd Automatic introduces 40XD drilling at EMO

Available in the UK from Floyd Automatic Tooling, the latest addition to the CrazyDrill range from Mikron Tool was introduced at the EMO exhibition in Hannover. The characteristics of the small drill CrazyDrill Cool SST-Inox were demonstrated for show visitors to international visitors.

Small, deep and fast, certainly characterises the new CrazyDrill Cool SST-Inox that incorporates internal coolant ducts and an innovative geometry and coating technology for the machining of stainless steels, nickel based super alloys and CrCo-alloys. With process stability guaranteed, the new drill available from Baldock-based Floyd Automatic has been significantly simplified and stabilised for the processing of small diameters as well as deep bores.

The range includes through coolant drills in six different working lengths that include 6XD, 10XD, 15XD, 20XD, 30XD and even 40XD. For machining holes between $\varnothing 1$ mm– $\varnothing 2$ mm, the max depth available is 20XD. From $\varnothing 2$ mm the entire range is available up to $\varnothing 6$ mm. In addition, there is a short pilot drill for a max bore depth of 3XD.

Why a newly designed drill?

While drills with spiral coolant ducts are available already in the small diameter ranges, many of these drills get into trouble with tough-elastic materials or with the poor heat conductivity of super alloys. Here the cooling through 'classic' round ducts is insufficient, even with high pressure. Premature edge chipping, packing of chips, build-up of the flutes are all symptoms that prevent process stable drilling.

This is important for industries that produce products from valuable materials and even more valuable finished parts. Markus Schnyder, head of Mikron Tool International and one of the initiators of the new tool, knows all about the problem: "For many years, our customers have been reaching the limits when drilling stainless steel. The process was not stable and it was too slow, thus, machining became extremely expensive. We wanted to find a solution. The development took us several years and we have depended on a close cooperation with our partners and this has included the use of the right blank material and a truly efficient coating."

A new geometry provides a chip-breaking



effect at the front and short and curved chips are the result. In the back, an open flute profile facilitates the perfect evacuation of micro-chips. There is a variant for long drills as they incorporate an open profile and polished flutes to help the easy evacuation of chips from the bore.

Performance and process stability is mainly given by the cooling of the tool with two spiral internal coolant ducts up to the drill tip. This guarantees a constant and massive coolant flow during the entire drilling process and this is an important factor to prevent overheating of the tool, even with high cutting speeds.

The coolant ducts have the largest possible diameter and are tear drop shaped.

right from the beginning. Combined with the innovative tip geometry, the cooling helps to break and flush out the chips from the flutes. All these characteristics make it possible to work with higher cutting parameters and to drill in one single stroke.

Starting with a drill for a depth of 10XD, new and longer versions were introduced until the 30XD and 40XD were presented at the Prodex 2019 show in Basel. When drilling starting at 15XD, it helps to have a short pilot operation to reach a high positioning accuracy. It also helps to guide the subsequent long drill and guarantees good straightness. So that this centring fits perfectly, Mikron Tool developed the complementary pilot drill whose tolerances



These ducts are located in an area with little stress and therefore the stability of the tools is not jeopardised. Comparing to the conventional round diameter, these ducts afford a 4-time higher coolant flow. At diameters under 3 mm, a power chamber in the shaft reduces the length of the ducts and provides higher coolant pressure.

The advantage of the efficient supply of coolant to the drill tip increases tool life as overheating of the cutting edge is avoided

are precisely tuned to the long drills. If requested, the tool can also simultaneously do a chamfer of 90 degrees. It also has the internal coolant to the tip and is available in diameters from 1 to 6 mm.

Floyd Automatic Tooling Ltd

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Massive savings on spindle tooling from CERATIZIT's Team Cutting Tools

Team Cutting Tools from CERATIZIT is delivering major savings to machinists with its latest special offer on spindle tooling from its Performance and Standard tools range. The offer includes a wide and diverse range of spindle nose tooling that is subject to a discount of 77 percent over standard list prices and is available to new and existing customers.

Adapter types included in the offer are SK 40, SK 50, BT 40, BT 50 and HSK 63, which can be supplied with choice of front-end toolholding systems ranging from sidelock, ER collet, drill chuck, shell mill, hydraulic, and heat shrink styles. Accessories such as pull studs, coolant pipes and ER standard and precision collets are also included in the offer.



The spindle tooling offer from Team Cutting Tools from CERATIZIT is delivering major savings to machinists

"As a group, we have invested heavily in stock of these products to be able to present customers with this significant discount on our normal list price for spindle tooling," says Tony Pennington, managing director, Ceratizit UK & Ireland. "By investing in this way, we are not only able to deliver these products at a highly competitive price but can also guarantee next-day, before noon, delivery from our logistics centre."

Spindle tooling is a vital component of cost-effective machining, so this offer, which runs until 31 May 2020, provides the perfect opportunity for machinists to equip themselves with high quality, high performance, adapters such as CERATIZIT's Shrink Fit and high pressure chucks from the WNT product brand with a significant price advantage. With the offer covering both the Performance and Standard ranges of spindle tooling again, there is a choice in what level of investment users want to make.

The WNT Performance range are the company's premium products aimed at delivering outstanding performance in demanding applications. The WNT Standard range is made up of adapters for general applications that are manufactured in higher volume to affect the price point, while maintaining high levels of quality and performance.

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When renovating railway lines, there are generally two preferred options: grinding or dynamic milling. Compared to grinding, the high-speed reprofiling of a line represents significant time and financial savings.

Specially designed trains, operating at a constant speed of 700 metres per hour, machine the existing track profile. By removing millimetres of metal from the damaged surface, the track is restored to its original condition. With each application, the first cutter roughens the surface, the second one finishes it, and the two units act on both rails simultaneously.

The operation provides a high-quality surface finish, while metal chips produced during the milling stage are transferred to a nearby container, ensuring no debris is left on the track.

This 'on-the-move' application requires specialised equipment to achieve optimum results, such as 'train machine tools' designed to carry dynamic rail milling cutters and inserts. An increasing number of



A wheel profiling application with no chip control

these are being produced by leading global manufacturers as demand from railway organisations and government bodies for track maintenance increases.

Global cutting tool manufacturer Dormer Pramet works in partnership with several high-speed milling machine manufacturers to deliver key projects around the world. One of these projects included the milling of three different rail profiles for a customer in the Netherlands.

Dormer Pramet's 600 mm diameter dynamic rail milling cutter was able to machine the combined profile (60E1, 54E1, 46E3 1:40) and another profile 54E5 1:40, without having to change the inserts. Using the same cutting tools across several profiles is hugely beneficial as it saves both time and costs, reducing the number of tool changeovers.

Tomas Hantek, application manager for railway at Dormer Pramet, says: "As with all railway projects, each application is different from the next, so we regularly tailor our products to meet the need of the customer.

"It is very important we work closely with the machine tool manufacturer and rail organisation to identify where adaptations need to be made to achieve the desired results."

The development of new rail technology is constantly taking place and modifications are needed on both sides to optimise the match between the machine and cutting tool. Dormer Pramet has adapted its popular dynamic milling cutter in various sizes, from 300 mm to 900 mm, with plans to develop a 1,400 mm diameter version in the future.

Tomas added: "We recently delivered a 300 mm diameter dynamic rail milling cutter to a customer for testing. This has been custom made to specifically fit their new machine. In the first trial, they discovered that the cutter profile was as they required.



The same wheel profiling application now with chip control, using Dormer Pramet's modified LNMT insert

However, they realised their new machine was not strong or rigid enough to cope with the demands of the application. We are now working with them to make some changes and help move the project forward."

At present, Dormer Pramet has more than 50 dynamic rail milling cutters out in the market, including in the Netherlands, Germany and Poland. This is an indication of the international nature of the railway segment, with tool suppliers, machine tool builders and customers from different parts of the world, working together on applications which often take place in different countries. This not only requires precise logistical management, but an understanding of different standards and accreditations between countries. Many projects involve large international organisations, as well as support from government agencies and administrations, along with affiliated transport associations.

Another example where Dormer Pramet provides support to the railway segment is in wheel returning. This too can see standard tools being modified to become custom-made specials, unique to the requirement of the application. Its assortment of rectangular LNMT and round ROEX inserts, for example, have proven a big hit with customers in North America,

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with the range available from its distribution centre in Hebron, Kentucky.

A customer in Philadelphia was having issues with its previous LNMT inserts as they were not able to break chips during a wheel turning operation. The resultant long, continuous swarf congested the area around the workpiece. The process to clear the chips is not only time consuming but can also be hazardous.

Dormer Pramet put forward its standard LNMT inserts, but during tests, found these too did not break the chips as required. Following further feedback and discussions with the customer, the company was able to make two key changes to its insert. First it added a corner radius chip breaker to relieve some of the pressure on the tool. It then tailored the geometry and design of the insert to prevent nesting at high depths of cut.

The end user wanted to make one pass, so the LNMT insert needed to be able to achieve a staggering .700" (18 mm) depth of cut at the first attempt. Following the changes, the insert was put in for further testing. Not only did this new design fix the chip control problem, but it consistently

outperformed all other inserts tested. The customer now orders from Dormer Pramet.

In addition, the company has started to use its RCMX, RCMT and TNMG inserts on a variety of operations, such as the turning down of axles. This has allowed it to reduce cycle time by an average of 30 percent, saving more than \$30,000 USD in the first year, with greater operational efficiency and improved performance.

Railway wheel turning is an area Dormer Pramet is looking to expand its assortment further. Where the LNMT can support large depths of cut, the company is now working on a new insert for delivering small depths of cut, around 1 mm.

A popular trend with customers when machining railway wheels is to perform the operation with a low depth of cut. This is still completed in one pass, but the



Dynamic rail milling application in operation using the Dormer Pramet cutter and inserts

reconditioning will be required more often between uses. This new product will support those applications. It is currently in the testing phase, with the aim to launch the insert in 2020.

Dormer Pramet

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Light cutting geometries for radius inserts extend range of applications for users

New insert geometries extend the list of suitable applications for the versatile CoroMill® 331 milling cutter from Sandvik Coromant. The latest additions to the portfolio are the availability of two new light cutting, periphery ground geometries for radius inserts to suit applications in the automotive and aerospace sectors.

Introduced for CoroMill 331 is -M30 geometry, which is designed to optimise the groove milling of steel and cast iron automotive parts. Available for size 11 inserts offering radius dimensions from 1.5 to 3.0 mm (0.059 to 0.118 in), -M30 geometry is defined by its light cutting action. This tough geometry is particularly beneficial when machine shops want to boost security in weak setup or long overhang applications, where it provides reliability and increased competitiveness. Grade availability includes GC1130, GC1020, GC3040 and the latest GC4330 steel milling grade.

Also launched is -L50 geometry, which is

aimed at aerospace component machining, as well as parts in the oil and gas industry. Offered on size 11 inserts with radius dimensions from 3.0 mm to 6.3 mm (0.118 to 0.248 in), light cutting action is also the principal attribute of the tough and sharp -L50 geometry, making it suitable for materials such as stainless steel, nickel-based super alloys and titanium. Optimised for use in good operating conditions and heavy application areas, GC1040, GC2040 and S30T are the available grade options.

"Groove milling is one of the most common application areas within indexable milling, and the new geometries are specifically designed to meet the demands of machine shops looking to improve process security, quality and cost," says Jenny Häll Jansson, global product manager Milling, Sandvik Coromant.

As a point of note, alongside -M30 and -L50, size 8, 11 and 14 inserts with a 4.0 mm (0.157 in) radius are being made available as



standard in -WM geometry. Intended to boost the milling of automotive parts, grade options include GC1130, GC1020, GC3040 and GC4330.

Far from just groove milling, CoroMill 331 is a universal concept that can provide flexible, high-precision machining in numerous face, shoulder, and side and face milling operations across all industry segments. A large assortment covers an extensive choice of diameters, widths, insert geometries, corner radii and grades.

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Special coatings extend service life of cutting tools used on non-ferrous materials

A variety of special coatings can significantly enhance wear resistance and life when machining highly abrasive materials such as CFRP, GFRP, graphite, Al alloys and ceramics.

Because machine tools constantly cut and grind away material at high RPMs to shape a workpiece, carbide cutting tools are often used instead of hardened steel to retain a sharp cutting edge and lengthen tool life. However, when highly abrasive materials such as CFRP/GFRP/sandwich materials, graphite, Al alloys and ceramics are machined, even carbide tools can be prone to rapid wear.

In such cases, further hardening cutting tools with a variety of specialty coatings can significantly prolong wear resistance and service life. For cutting tools that are extremely expensive, this not only reduces costs but speeds overall cycle time as well.

These coatings, applied to machine tools such as taps, reamers, end mills, drills, inserts, counter sinks and other cutting tools, come in a variety of styles from physical vapor deposition (PVD) coatings up to proprietary diamond coatings.

The need for greater abrasion protection

In a growing number of industries including automotive and aerospace, manufacturers are continuing to place more emphasis on design and weight reduction. Subsequently, designers are increasingly using composite

fibre reinforced plastics in many parts. However, these composites are exceedingly rough on cutting tools. In industries like automotive that require stronger, lighter materials, aluminum silicon alloys are also used. However, the higher the silicon content, the more abrasive the material.

High-performance coatings

When it comes to machining very abrasive materials, uncoated carbide tools experience accelerated wear. To increase tool life, high-performance coatings can provide a vital protective barrier.

The ideal coating would have qualities such as a very hard, protective surface that, at the same time, maintains the sharp cutting edges that enable clean and precise cuts, while speeding production time.

PVD coatings

One alternative that is increasingly being utilised in these industries are strong, non-hazardous, Physical Vapor Deposition (PVD) coatings. PVD describes a variety of vacuum deposition methods that can be used to produce thin coatings. PVD is typically used to coat tools and components at relatively low coating temperatures of 150-500 °C, which avoid altering the fundamental material properties.

Among the PVD options are several carbon-based coatings available that provide a unique combination of extreme

surface hardness and low friction coefficient properties. One example, BALINIT Hard Carbon by Oerlikon Balzers is used for the machining of non-ferrous materials, including aluminum alloys with up to 12 percent silicon content (AlSi-12). The coating is also ideal for CFRP and GFRP materials, if the volume of fibre is not too high.

The BALINIT Hard Carbon coating is thin, smooth, and has high hardness (40-50 GPa), making it well suited for applications that require superior wear protection. In addition, the thin, smooth application helps to maintain sharper cutting edges.

As an example, at a Malaysian manufacturer producing HDD aluminum alloy baseplates, coated carbide end mill tooling exhibited less abrasive wear and produced 95 percent more parts with 55 percent lower production costs than untreated tooling.

The combination of coating hardness along with a low friction coefficient can also dramatically improve production even with dry machining.

In an application involving CFRP and thermoplastics workpieces, for example, a Hard Carbon-coated counter sink tool produced 180 percent more parts than an uncoated tool. In another comparison, a coated carbide end mill doubled the parts produced with dry machining, compared to an untreated tool using lubricant.

Diamond coatings

When carbon content in composites or silicon content in aluminum alloys becomes too high, cutting tools typically require a diamond coating to prevent wear.

Traditionally, polycrystalline diamond (PCD) cutting tools have been utilised in



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such instances. PCD is a composite of diamond particles sintered together with a metallic binder. Diamond is the hardest, and therefore the most abrasion resistant, of all materials.

As a cutting tool material, PCD has good wear resistance but it lacks chemical stability at high temperatures and dissolves easily in iron. PCD tools are therefore usually limited to materials such as high-silicon aluminum, metal matrix composites (MMC) and CFRPs.

In addition, PCD tools are geometrically limited in structure, and may be too rough or unrefined for the optimal machining of the wide range of non-ferrous materials. Finally, PCD cutting tools can also be quite expensive.

As an alternative, plasma-assisted chemical vapor deposition (PACVD) can be used to apply crystalline diamond structures in varying thickness and roughness. This can be highly advantageous for machining fibre-reinforced plastics, graphite, non-ferrous materials and ceramics. The diamond coating extends tool life while also improving cutting quality and surface finish.

With the PACVD coating process, a carbide cutting tool is sequentially coated by two different gasses in a heated vacuum container assisted by plasma. Each

alternating cycle that built the atomic layer on the surface and the number of cycles thus controls the thickness of the final coating.

The PACVD process allows the diamond coating to be applied at varying thicknesses (6 µm to 12 µm), which can be customised to suit the application.

In terms of satisfying such qualities, BALINIT Diamond Micro and Nano coatings are examples of PACVD-based diamond coatings formulated specific to the needs of a wide range of highly-abrasive, non-ferrous materials.

While both are well suited to machining GFRP, CFRP and ceramics, the rougher "micro" formulation is ideal for graphite.

With this approach to machining, carbide tools can be coated to enable the cutting of graphite workpieces with better quality and substantially greater speeds. Combined with significantly extended tool life, this allows even sophisticated workpieces and fine structures to be produced with a single cutter in a single clamping, which can help to eliminate cost-intensive reworking procedures.

When it comes to machining aluminum alloys, including those with high silicon concentrations (AlSi-17 or higher) and ceramic particles, the "nano" diamond

coating can replace more expensive PCD tools.

In an application where a Duralcan composite workpiece comprised of ceramic particle-reinforced aluminum materials was drilled, a PACVD-based diamond coated cutting tool drilled 20 times more holes compared to even very hard "diamond-like" carbon coatings.

The "nano" coating also works well with abrasive CFRP and GFRP materials.

The bottom line

Some manufacturers may be inclined to use uncoated carbide cutting tools or traditional coatings because of their familiarity with such methods. However, those that take advantage of the superior capabilities of high-performance Hard Carbon PVD and Diamond PACVD coatings will significantly harden carbide cutting tools and improve part quality. This will enhance production and tool service life, which also improves the bottom line.

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ITC increases productivity for automotive subcontractor

Leading Scottish subcontract manufacturer, Euro Precision Ltd has now specified cutting tools from Industrial Tooling Corporation (ITC) to improve productivity on a range of automotive components. The Glenrothes subcontract engineering company has built its reputation by manufacturing critical precision components and assemblies to exacting quality standards for the aerospace, automotive, medical, telecommunications petrochemical and electronics sectors.

The diverse customer base has been established over a 25-year history and, from its 30,000 sq/ft factory, the company boasts clients such as Siemens Healthcare, Glenair, Leonardo, Zeiss and AMG Petronas as a few examples. With a customer base that any subcontract business would be proud of,

Euro Precision has established a reputation for production of high-quality workmanship, inspired innovation, cost-effective solutions and customer service.

The Fife company recently undertook a project for Mercedes HPP (High Performance Powertrain) that required programming and tooling efficiencies and improvements for the machining of a series of engine components. The complex outlet manifolds and valve waste assembly are manufactured from Inconel 625 on Euro Precision's high-spec Matsuura MAM-72 5-axis multi pallet machining centre. Manufactured for the next generation of supercar, the Mercedes HPP project requires over 2,700 manifold outlets and 2,000 valve waste assemblies. With such production volumes, it was critical for Euro Precision Ltd to get the process running efficiently as possible and this is where ITC entered the fray.

Euro Precision engineering manager Grant Steele says: "We required a stable process that could achieve the shortest possible cycle time while returning good size control and cost-effective tooling solutions. I already tooled the part up with another manufacturer and because material was Inconel 625, I was expecting to take a hit on slower machining times and poor tool life. However, based on production requirements and the project time frame, I couldn't live with current method.

"I discussed the situation with Gary Heaney from ITC. Gary has been a regular supplier of high-quality aluminium cutting tools to Euro Precision for many years. Down the years, Gary has successfully supported us on many machining projects to reduce cycle times, tooling costs and improve our machining performance and consistency. With his experience of supplying tooling to the aerospace engine sector that is primarily cutting high-temperature alloys, Gary seemed the obvious go-to person.



ITC end mills in action at Euro Precision

"Gary immediately doubled the surface speed by introducing ITC's Cyber Series of multi-flute variable helix end mills and a trochoidal machining strategy at a 3XD axial depth of cut with a four percent radial step over and a high feed per tooth. The outcome was outstanding.

"With some subtle programme changes, we instigated a trochoidal machining strategy that increased the step over and radial engagement with the application of ITC's 12 mm diameter solid carbide Cyber Series. This reduced the cycle time by 50 percent and increased tool life by three times."

By implementing a machining strategy that incorporated a 3XD axial depth of cut instead of the previous 1.5XD strategy, Euro Precision was able to conduct most of the



ITC's Cyber Series variable helix end mills at Euro Precision

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rough machining in a single pass. The machining parameters far exceeded the realms of possibility for the previous tools supplied by a prominent international tooling vendor. The performance of the ITC Cyber Series and its ability to prolong machining on such a challenging material led to further ITC solid carbide end mill introductions to the prestigious project.

Grant Steele recalls: "Following the success of the roughing tools, I asked Gary to look at the entire part. He subsequently supplied a range of radii corner tools and micro ball end mills that have performed first time, every time. We are now machining another high-performance engine component and ITC's Cyber tooling is again producing the goods.

"ITC's Gary Heaney certainly hasn't rested on his laurels. He is always looking at continuous improvement and we are already testing new indexable tooling solutions from ITC business partner Widia."

The Scottish manufacturing success story at Euro Precision is built upon the foundation of high-specification machine tools like the two Matsuura MAM72 5-axis machining centres. The Matsuura machines incorporate the BIG KAISER face and taper

dual contact spindle interface, which is the only genuine face and taper contact system on the market. To benefit from the performance, rigidity and precision of the BIG KAISER face and taper system that guarantees run-out of one micron at the nose and three microns at 4xD, Euro Precision has installed a complete range of BIG KAISER precision collet and chuck systems that are available from ITC.

The stability of the Matsuura spindle configuration and the BIG KAISER face and taper interface has enabled ITC to introduce a variety of high-performance tooling solutions. This has included a complete suite of 5 and 6 flute VariMill end mills as well as indexable face and shoulder milling tools from Widia with both rough and finish machining insert designations. The solid and robust machining platform has enabled ITC's Gary Heaney to utilise both the ITC and Widia tools to full effect. The results have been a revelation to the Fife manufacturer, which has also implemented Widia indexable drilling and turning as well as solid carbide drilling to great success following the results on the Mercedes Inconel project.



Finished manifold part machined at Euro Precision

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Tungaloy's new face mill eliminates interference issues

Tungaloy has now introduced its new DoQuad-Mill, the latest breakthrough in face milling cutters designed to address interference between the cutting tool and the workpiece. Standard face milling tools generally prevent end users machining close to walls or fixture clamps due to inclined entry angles. The DoQuad-Mill has been developed with a near 90° entry angle that ensures the DoQuad-Mill cutter is interference-free and therefore capable of face milling extremely close to the walls and other features.

The double-sided square insert with eight economical cutting edges incorporates a concave cutting edge profile with a large inclination angle. This improves swarf evacuation and generates barrel-shaped chips, a feature that prevents swarf re-cutting. The inserts incorporate a large rake angle that generates low cutting forces that generates a smooth cutting action and reduces stress and forces on both the machine spindle and cutting tool. This is extremely effective and suitable for customers operating low-powered machine

tools or working with low rigidity or weak fixture settings.

The new DoQuad-Mill offers cutter diameters ranging from 50 mm diameter up to 100 mm in either standard or close pitch insert designation. The standard pitch variant is designed to ensure chatter-free milling, whereas the close pitch cutter is suited to applications where high-feed and high-speed machining is essential. The DoQuad-Mill inserts are available with corner radii of 0.8, 1.2 and 2.0 mm. For precision machining applications that require high-quality surface finishes, a wiper insert is also available.

The DoQuad-Mill is available with a selection of insert grades and coatings to cater for the machining of a wide variety of material types. This includes the AH3135 PVD grade that has a high fracture resistance, making it the first-choice grade for machining steel and stainless steel. Complementing the AH3135 is the AH120, a PVD grade that is the perfect choice for general milling applications in steel and cast iron. For machining cast iron at high speed,



the DoQuad-Mill can also accommodate the Tungaloy T1215 CVD grade that demonstrates exceptional wear and chipping resistance. For the productive high-speed machining of both steel and stainless, the T3225 grade is the first-choice grade. The tool life, longevity and performance of the insert grade is enhanced by Tungaloy's proprietary PremiumTec Special Surface Technology.

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Leader 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 an absolute minimum.

Managing director Mark Jones 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 microns by means of 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.

"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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Don't underestimate the value of good workholding

Autonomous gripping

Industrial gripping is about to undergo a fundamental change. Whereas until now the pickup and depositing positions of workpieces, their geometry and the relevant gripping parameters always needed to be manually defined. In future gripping systems will handle the widest variety of gripping tasks of their own accord. Greeting system specialists at SCHUNK are demonstrating the first solutions.

Plug & Work will be a key feature in the smart factories of tomorrow. What has already been realised successfully with the mechanics, will in future be made possible for gripper process control. Logically from a gripping point of view, the specialists at the SCHUNK Smart Labs are developing approaches as to how robots and other handling systems can carry out gripping tasks autonomously or semi-autonomously. The vision is a learning component assembly based on a 3-layer architecture comprising motion controller, grasp controller and services. The plan is that, despite having a complex internal structure, the assembly will enable the greatest possible user friendliness on the outside.

Grippers perform gripping and path planning

SCHUNK has shown how this can be successful based on various pilot applications from its technology factory. At the Hannover Messe, the competence

leader for gripping systems and clamping technology, presented a smart gripping application where different components are differentiated via the gripper alone. Like a groping hand, the gripper will sense the geometry and composition of parts for gripping and categorising them. In a second application, parts arranged at random are identified via a camera, autonomously gripped out of a transport crate, and guided into a machining process. The system relays information gleaned on the part to subsequent stations so that, for example, an intelligent clamping force block is capable of automatically coordinating its stroke and clamping force to the next part. In future, according to SCHUNK, grippers will not only grip but also handle all gripping planning in interaction with 2D and 3D cameras, as well as communication with upstream and downstream components.

Learned empirical data as the basis

In another user case that makes use of machine learning approaches for workpiece and gripping process classification, interlocking building blocks are randomly combined and presented to a lightweight



With smart gripping, intelligent SCHUNK grippers measure, identify, and monitor gripped components as well as the ongoing production process

robot in a random arrangement on a work surface. The robot's task is to pick up and transport the blocks away. After just a few training attempts, the system can classify how to handle the range of workpieces and the resultant combination options. The gripper knows how to pick up and transport the workpiece for handling optimally based on empirical values it has learned. In doing so, the camera that captures the scenario interacts directly with the gripper and guides the robot to its destination. After just a few repetitions, the system is capable of classifying future combinations and arrangements of its own accord and acting autonomously.

Sharing learning experiences

These technologies are gaining increased attractiveness due to their ability to share learning experiences acquired for example with other gripping systems for similar applications in a production network or across sites, for example using cloud solutions. If the object is already known, the relevant optimum grip will automatically be initiated. If it is not known, it will be detected by the camera system and be determined how it can best be gripped on-the-fly. Learning experiences will in turn flow directly into the system, extending the corresponding library of gripping strategies.

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Due to artificial intelligence, the SCHUNK SVH 5-finger hand can identify any objects in any position and autonomously develop and apply appropriate gripping strategies

Gewefa uses EMO to launch a number of new products

Toolholding specialist Gewefa and its UK partners EWS, OTT-Jakob, Pibomulti, Nann and Rineck were out in force at the recent EMO 2019 exhibition with the show acting as a platform for the introduction of a number of new products.

On the Gewefa stand, face and taper toolholders featured prominently, reinforcing Gewefa's expertise in this technique which is particularly suited to heavy duty and very high-speed machining applications.

The Gewefa family of face and taper toolholders is among the most extensive available and now covers BT and DIN formats in SK30, 40 and 50 tapers to offer comprehensive application capability. Toolholders are available as collet chucks, shell mills, face mills, shrink clamp, hydraulic chucks and in extended length and adaptor formats.

Featured for the first time was the innovative M96+ER hydraulic chuck with an external thread connection permitting use with all driven tools with ER spindles.

The M96+ER hydraulic chuck is a highly

flexible toolholding system that fixes on the collet location of ER driven head spindles and, being a hydraulic chuck, it offers exceptional all-around grip on the cutter with anti-vibration damping for improved surface finish.

Gewefa partner companies also exhibited in their own right:

EWS, the driven tool expert, introduced a new intelligent tool monitoring technique called CyberCon4 which monitors a range of processes within the tool in order to optimise its performance.

Swiss speeder and angle head specialist Pibomulti showcased 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.

German machine tool accessory specialist OTT-Jakob introduced an 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. Heat shrink clamping machine expert Rineck featured bench top, free-standing and fully automatic machines from its range, while collet specialist Nann showed two new 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.

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Hainbuch launches smallest quick change-over interface on the market

Hainbuch has set new standards with the Centrotex quick change-over interface. The proven system is now also available in a version for smaller spindles. Thus, today Centrotex S is claimed to be the smallest system available on the market for setting up clamping devices in a matter of seconds. With its diameter of just 224 mm, it is the ideal quick change-over system for machines with a small workspace.

No compromises in performance

With repeatability to ≤ 0.002 mm on the



interface, without having to align, the latest version of the Centrotex quick change-over system can also meet the most rigorous requirements. The machine adapter is mounted on the spindle and the clamping device equipped with the adapter counterpart can be exchanged for another clamping device in less than a minute. Long setup times are therefore a thing of the past.

Easier operation

The smallest Centrotex version does indeed incorporate the proven technology of its big brother. However, it is clearly superior in terms of convenience. The Centrotex S is actuated via just one radial locking screw and ergonomic operation has been significantly improved, thanks to the fewer tightening turns required. In addition, the Monte q changing fixture offloads the machine operator and contributes to a faster clamping device setup.

Key advantages comprise: interface between machine and clamping device; only one radial locking screw; suitable for spindle nose KK5, KK6, AP140, and AP170; repeatability to ≤ 0.002 mm on the interface



without having to align; ergonomic handling; resistant to contamination; for easier handling, the Monte q changing fixture can be implemented for heavy clamping devices.

Benefits include: clamping device change-over in less than one minute; no compromises in the selection of clamping devices, job-oriented manufacturing; no loss in rigidity, in comparison with clamping devices that are bolted directly on the machine; higher machine availability; short return on investment.

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Advanced subtractive technology to make its UK debut

The new ULTRA 9 laser cutting, drilling and marking system from Universal Laser Systems will make its UK debut at the upcoming TCT show.

The ULTRA 9 laser technology is the latest must-have tool in modern digital manufacturing. Having access to both additive and subtractive digital technology gives designers, product development engineers and manufacturing teams the increased flexibility and capability to keep pace with accelerating product lifecycles and dynamic customer requirements. The ULTRA 9 meets all the key attributes of rapid digital technology: wide material compatibility, high precision, and speed.

At the core of ULTRA 9 is the flexibility to process virtually any material by allowing users to select the ideal combination of wavelength and power for their application. The system supports up to three laser sources and wavelengths: CO₂ in 10.6 µm and 9.3 µm and fibre in 1.06 µm, with power options ranging from 10 to 150 watts. Using patented MultiWave Hybrid™ technology, the ULTRA 9 is even able to optimise energy absorption by focusing any combination of three wavelengths, either consecutively or simultaneously, onto one focal point on the target material. This enables the system to process the broadest range of materials, including multi-layer laminates and complex composites.

Today, product designers, engineers and manufacturers alike demand high quality and finish even on prototype parts. The ULTRA 9 addresses this by providing high baseline precision and extreme "tune-ability" to allow users to adjust the laser output to their application. The ULTRA 9 can provide consistent and repeatable results through stable laser energy delivery and selectable power density. The ULTRA 9 motion system also incorporates advanced path planning and addressable beam positioning as low as 2 µm, which help maintain part dimensional integrity. The unmatched ability of the ULTRA 9 to control and fine tune these critical laser parameters sets a new standard in processing quality.

Not only does the ULTRA 9 produce quality results, it is also highly efficient. Throughput is optimised with a maximum

beam positioning speed of 3,810 mm/sec (150 in/sec) for vector processing and a maximum raster material processing speed of more than 7,620 mm/sec (300 in/sec). Through advanced path planning and other features like material-independent autofocus, high quality results are consistently achieved in the shortest possible processing time.

Universal Laser Systems will be running live demonstrations with the ULTRA 9 throughout the show and company specialists will be on hand to discuss specific applications and advise on the integration of this high level non-contact subtractive technology as part of a digital manufacturing strategy.

For those who wish to find out more about the ULTRA 9 system ahead of the show, Universal Laser Systems has produced an informative article titled "Balancing The Digital Manufacturing Equation With Advanced Subtractive Laser Technology" which can be viewed or downloaded from: www.ulsinc.com/company/news/individual-event/advanced-subtractive-technology

Universal Laser Systems (ULS) is a leading provider of laser material processing solutions and has been advancing the application of laser technology since 1988. Research and development efforts have resulted in numerous patents, with several pending, in our continual pursuit to develop and enhance laser systems that benefit the customer. The R&D philosophy and

execution are based upon designing highly modular solutions which give customers the flexibility and investment protection to optimise laser systems as their business evolves.

ULS's solely owned, custom-built, state-of-the-art engineering and manufacturing facilities are located in Scottsdale, Arizona, where it manufactures both lasers and laser systems. Additional operating offices are located in Vienna, Austria and Yokohama, Japan. Universal Laser Systems leverages a global network of authorised local representatives around the globe for customer sales and service support.

With a most comprehensive product offering, Universal Laser Systems has deployed its technology in almost every country in the world, with customers ranging from small, family-run operations to highly automated Global 2000 companies.

Whether you are a start-up company or an established business, ULS has the technology, people, and experience necessary to help you develop and maintain a competitive advantage. No other laser material processing company claims to have a more comprehensive portfolio of R&D, solutions, global service, and material processing experience than Universal Laser Systems.

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ARNO StoreManager creates order, more space and more productivity

Since 1963, ITT Cannon has produced high-quality connectors for complex connectivity solutions in data and power transmission. The Weinstadt-based company develops and manufactures complete solutions with a large depth of production for the aviation, medical engineering, plant construction and automotive industries. Employees manufacture connector housings and pins on modern lathes, milling machines and machining centres. The numerous tools required in production are managed by a recently installed tool management system from ARNO Werkzeuge. This has a direct impact on productivity compared to the search times that were previously required to find tools.

“The StoreManager gives us more space in the machine shop, more space to store tools and more time for production,” says David Memmler. The engineer working in Mechanical Production at ITT Cannon GmbH immediately sees the benefits when he reviews output at the end of every shift. The time previously spent searching for tools is now devoted to production. “This was urgently needed in view of the full order books we have had over the past few years,” adds Martin Deuschle, head of Mechanical Machining in Weinstadt.

A footprint of a few square metres instead of several cabinets with tool removal and return round the clock

At ITT Cannon, connector housings mainly made of aluminium, contacts and pins made of brass or copper are produced in three shifts on lathes, milling machines and machining centres. Since 2017, machine operators quickly select inserts, milling cutters, drill systems and completely pre-assembled tools which they need from the StoreManager tool management system from ARNO Werkzeuge “and return them to the same place,” stresses David Memmler. The company installed one StoreManagerPro module, a Start drawer cabinet and three units of the new StoreManager Locker cabinet system containing large compartments. Completely pre-assembled machining tools are accommodated behind the 200 mm wide and 150 mm high black powder-coated swivel doors. This is possible as the compartments are 250 mm deep and it considerably simplifies and speeds up tool configuration. Pre-configuration is something that a separate employee can carry out and it offers machine operators enormous time savings.

Depending on the configuration, the carousel system on the StoreManagerPro



The carousel system of the ARNO StoreManagerPRO offers up to 2,160 compartments

contains up to 2,160 storage places on shelves containing one, two, three or four compartments for controlled access, single removal and return. The software manages removal and return efficiently, reliably and smoothly. It also monitors stock levels and prepares documents for restocking. Larger and longer items are stored in the drawers of the StoreManagerStart. At ITT Cannon, this includes the clamping systems to match the tools. “We store about 9,000 items on a footprint of a few square metres. In some cases, several items are placed in a single compartment,” says David Memmler.

Employee responsibility rises

Today, tools are available 24 hours a day, seven days a week. “This corresponds to how we need to work at present in order to complete orders,” continues David Memmler. In the past, employees had to count the tools used at the end of the day and enter this in spreadsheets. Today, this task is arranged by the software, totally and without gaps. There are practically no stock shortages anymore. Each tool is distinctly assigned to the employee who ordered it to complete an order. “This creates obligations



Users save space and time and increase productivity using the StoreManager tool management system from ARNO Werkzeuge

and traceability but also strengthens every employee's sense of responsibility for the part which is removed," assures, ARNO sales engineer Ulrich Wenzel. David Memmler confirms this and speaks about previous practices at the company: "We no longer have 'secret caches' stashed at the machines. Neither are there any missing tools because re-orders failed to go out on time."

The machine operator or a specially deployed employee prepares the tools for the eight lathes and six machining centres for each job based on a setup sheet. They are then supplied job-related to the machine on a trolley. "This practically rules out any possibility of confusion in tool selection," explains Simon Lang, product manager of Tool Management Systems at ARNO Werkzeuge. "The StoreManager finds the right tool based on the scanned codes on the job data sheet and releases the related compartment by light signal. The hatch door then opens for the operator to remove the tool. On return, the system also finds a suitable empty cabinet compartment."

Small batches with frequent workpiece and tool changes

Production runs at ITT Cannon are usually small. In many cases, they range from 20 to 200 units and sometimes even 500 units. As a result, the machines need frequent retooling, with the right tools of course. "This is where the StoreManager makes full use of its benefits," says Simon Lang. However, the system comprising software and cabinet compartments is also very helpful with large production runs. "The StoreManager then finds the right tool for the job. The process is always reliable no matter what the operator's technical knowledge is. The scanner is incorruptible and the program never selects the wrong tool."



The StoreManager then finds the right tool for the job. This process is always reliable and independent of the operator's technical knowledge. The scanner is incorruptible and the program never selects the wrong tool



The StoreManager finds the right tool based on the scanned codes on the job data sheet and releases the related compartment by a light signal. The hatch door then opens for the operator to remove the tool. On return, the system also finds a suitable empty cabinet compartment



The StoreManager from ARNO Werkzeuge creates more space in the shop, provides more storage space for tools and saves more time for production



Larger and longer items are stored in the drawers of the StoreManagerStart. At ITT Cannon, this includes the clamping systems to match the tools

The fact that the right tools are always stored for the job and machining process, such as inserts, grooving tools or drill systems, comes from many years of collaboration between ITT Cannon and ARNO Werkzeuge. That's because ARNO Werkzeuge is based in Ostfildern. Martin Deuschle adds: "Some time ago, we drastically streamlined our supplier structure down to three or four. Of course, we benefit from the fact that ARNO Werkzeuge not only sells but also offers vital support in selecting the right tools to cater for a new problem or a special machining process."

StoreManager is a prime example of integration

This is all part and parcel of the job for Ulrich Wenzel. "When our customers are faced with new challenges, we manage to find the right solution based on our enormous pool of customers and machining processes and because of our many years of experience. As

a result, we can recommend the best tools for a particular job and in the best case we can make an offer straight away." This is welcome news for Deuschle since "today, we no longer have to send off trial orders. In the past, we used to order 20 tools on spec from a supplier and then after trying out three or four, we found out that they were not suitable for a particular job. We no longer have to do this." If ever ARNO Werkzeuge is unable to supply the best tool for the job, then this is no problem for Simon Lang: "Our StoreManager can handle integration and can also manage tools made by other manufactures, safely and reliably." In the end, every effort and solution should serve the interests of the manufacturer's productivity.

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JAVELIN update helps when things go wrong

New functionality allows tracking, logging and actioning on non-conformance

What is said to be the most important update in JAVELIN 2020.0 is geared towards tracking, logging and actioning things that have gone wrong.

"This is for when a supplier sends sub-standard goods, or if a customer's not happy with parts or products you've sent out," says ERP sales manager Deon Price. The new Non-Conformance Report (NCR) addition supports users' supplier, customer, and internal quality processes by recording and monitoring NCRs with multiple user-defined templates.

"It links NCRs to supplier returns, customer returns, works orders, quarantine stock transactions, defects and scrap. There's also a general option available to create NCRs not related directly to specific parts, but for any other need to record a non-conformance."



He says many companies already keep track of non-conformance information outside JAVELIN, in an Excel spreadsheet for example, "but being able to directly link the information to purchase orders, works orders and sales orders within JAVELIN means everything is secure, and the system produces full reports."

A number of updates have been made to Advanced Scheduling. A new function can now consider the acknowledged date of a purchase order item, rather than the due

date, and will delay the scheduling of operations until the material is received. Deon Price points out: "This allows supply to be delayed, but the schedule is more accurate, while maintaining the due date that MRP is showing."

Other items of new and enhanced functionality to Advanced Scheduling include options to ignore Alternate Ops and Alternate WCs; an Unscheduled Operations Enquiry has been added, with filters, which can be printed and exported to Excel; new metrics for the number of alternative ops, the number of ops scheduled on obsolete WCs and the number of unscheduled ops.

New applicable warnings have also been added to a number of items after a Scheduling run, while the Planning Board for Advanced Scheduling now retains the last settings on Number of Days in View and the Highlight option. Using "Max Cycles for Configured Parts," MRP can now be set to check for Configured Part demand, automatically approve and repeat MRP to calculate and flush through any Configured demand.



"Previously, when configured parts were in use, MRP needed to be run for each BOM level and the approvals done at each level," says Deon Price. "This new functionality speeds up the process considerably."

Supply v Demand enquiries now consider

the Sales Order line. This is related to contract control, in that unique contracts are Sales Order line dependent, so this is now incorporated into the supply and demand enquiry.



An important new Sales function sees clarification of Sales Order item dates. The Promise Date is the date the customer expects to receive their goods, while the Sales Order Due Date will be calculated from the Promise Date minus the transport time. "This is the date that MRP uses to ensure the goods are available for despatch. The update makes this much clearer and presents the dates in a logical order," explains Deon Price.

A new security feature now prevents accidental despatch against a Sales Order line with a zero value. Zero Price Sales Order items now default to To Be Arranged and are not available for Sales Issue. If the price is meant to be zero, for instance, a free sample, the TBA flag can be manually unchecked, allowing Sales Issue.

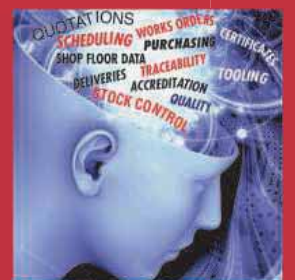
Stock Details are now recorded for Non-Trace parts, making it easier to report against stock, as the data is stored in one table.

Deon Price says another important function is that Stores now have optional restrictions of Planned Issue, Sales Issue, Production Receipt, and Goods Receipt,

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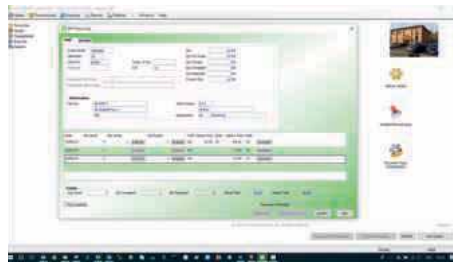
preventing specific Stock Transactions, to enforce any Stock Usage Limitations, such as Prevent Planned Issue from Bulk Store, or Sales Issue from Quarantine Store.

Following customer requests, JAVELIN developers have created a new Country of Origin field on the Goods Receipt note, which defaults to the Supplier's VAT country. This provides more transparency by identifying where the purchase originated from. The function can be over-riden, if required.

Nest Material Issue within Shop Floor Data Capture now consolidates Supply and amortises Demand by the required Contract strength. The Stock Transaction Log now records and displays the program used to perform the transaction.

Previously only available as a report, an Overdue Items Enquiry has been added, enabling data to be exported to Excl. Also, new filters have been added to Mass Stock Transfer, based on Row, Bin and Contract.

In JAVELIN's Documents section, default attachments can now be added to each document type. Key use for this is attaching terms and conditions to all Purchase Order emails. Customer focused documents can now have their own customer profile set



against each copy. Updates to the Works Order Data Pack Print mean that Documents set against the Works Order or Works Order Part can now be printed. In earlier versions of JAVELIN, the data pack could only be defined on the Part.

Logon keystrokes can also be reduced, with Active Directory Logon now being supported, as JAVELIN can be activated automatically when the user logs on to Windows.

Other items of new and enhanced functionality include: WIP recording is now easier to use, and multiple lines can now be entered, while Outwork WIP operations are now booked by a separate program: Icons can now be dragged and dropped within a desktop tab, making the desktop more intuitive and easier to modify: settings of most enquiries are now saved according to

the user/machine, and open at that point when next accessed; all email address fields now have an icon to create a new email Faster Configured Part Formula calculations; several optional ranges added to Set WO to Uncosted; the Supplier On Time In Full report has the option to use the First Acknowledged Date; Purchase Invoice Matching now requires that goods and VAT totals match individually, rather than as a total. This covers off rare instances where the total may match, but component values don't; for customers using Standard Scheduling, the maximum number of weeks in the Daily Schedule has been increased from three to 99.

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

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Optimising engine design with metal additive manufacturing

Global engineering technologies company, Renishaw worked with engine manufacturing company Cobra Aero, based in Michigan, USA, to optimise its design processes for aircraft and motorcycle engines. After working with Renishaw to develop new manufacturing processes, Cobra Aero invested in the AM 400 system to increase its additive manufacturing (AM) capabilities.

To optimise the design of its engine cylinders, Cobra Aero worked with Renishaw to gain expertise in AM. The company visited a Renishaw Additive Manufacturing Solutions Centre in the USA and collaborated with Renishaw engineers to use AM to improve the design of a cylinder for an unmanned aerial vehicle (UAV). Using AM technology allowed Cobra Aero to design a lattice structure to increase airflow, as well as allowed it to produce one solid, lightweight part.

"Staying at the cutting edge of manufacturing is important to Cobra Aero," explains Sean Hilbert, president of Cobra Aero. "Investing in AM allows us to develop

tools and new products for high value, small volume applications, speed up the manufacturing process and produce designs that would not be possible using conventional subtractive machining.

"We decided to redesign the cylinder because of its importance in an engine. Design changes to this part of the engine must happen rapidly and it is also a high value part, which is why we have chosen to additively manufacture this component. Improving the performance of the cylinder will also improve the overall performance of the engine.

"By using metal additive manufacturing, Cobra Aero was able to design a part that was unique to the application," explains Stephen Anderson, AM business development manager at Renishaw Inc.

"By using our laser powder bed fusion technology, Cobra Aero was able to produce a single part with complex lattice structures that performs better than conventional component manufacturing techniques."



Renishaw is a leading provider of metal additive manufacturing systems. For more information. The company's success has been recognised with numerous international awards, including eighteen Queen's Awards recognising achievements in technology, export and innovation.

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Hydrafeed continues to put faith in PSL Datatrack

Hydrafeed Ltd has seen its business grow significantly over the last few years. There has been continued expansion of its subcontract engineering services and the company's renowned bar feed systems manufacturing expertise, alongside its new sole UK and Ireland agency for RoboJob's robotic solutions. PSL Datatrack production control software has continued to play a major role in the company's growth, becoming an indispensable part of the business and helping to smoothly progress each aspect of the business.

Taking control of Milton Keynes-based Hydrafeed in 2012, managing director Martyn Page embarked upon a major overhaul of the company's business administration procedures, including investment in PSL Datatrack to replace DOS and paper-based systems. Aiming to grow the subcontract business quickly for customers in a variety of industrial sectors, the administration processes needed to be as efficient as possible.

"Initially, the challenge was to get the details of all our stock and material data as well as customer information loaded on to the PSL Datatrack system. Once that had been done, with full support from PSL Datatrack, we were soon able to realise the benefits and our staff quickly bought into the advantages of the system," says Martyn Page.

According to Hydrafeed's production director Daren Drew, PSL Datatrack has had a huge impact on the subcontract side of the business. "At any time on the shop floor we have in excess of 400-500 components going through. We need to trace and track all the materials involved, organise treatments and subsequent deliveries and invoicing. This could have been a logistical nightmare, but PSL Datatrack has smoothed out that side of our business completely. We can see everything on PCs throughout the factory."

Any opportunity for Hydrafeed to quote for new and repeat business starts with the generation of a quotation using PSL Datatrack. This is then the catalyst from which the subsequent production process and supporting administration of an order evolves. Quotation times alone have been reduced from around 15 to 1-2 minutes.

PSL Datatrack records and tracks all aspects of an order from that initial

quotation through to delivery and invoicing. Once a works order has been raised the system generates the material requirements and the purchasing module is used to order materials needed to fulfil the job from suppliers. This is then traced through the shop floor with costs of the operations, materials, tooling and any subcontract processes all fully recorded. The actual time taken for manufacturing, details of when parts are made, on which machine and by which operator is also recorded and this historic information can be recalled at any future time.

All jobs are prioritised and materials are made available before setup commences. The Work in Progress module allows the company to respond quickly to any urgent customer requirements as management can see what work is being undertaken in each department and what jobs are being queued at specific machines. "This allows us to make decisions about prioritising jobs and moving work around," says Martyn Page.

Consideration is also being given to investment in Status Board display screens for each department as part of the company's continuous commitment to remaining as efficient as possible. Status Boards will allow all jobs going through the shop floor to be seen in real time, so that management can make instant informed decisions on priorities, thereby maintaining and improving customer service.

The benefits that have resulted from the use of PSL Datatrack in terms of traceability and the generation of certificates are vital to Hydrafeed's quality management system and to maintaining ISO 9001:2015 accreditation. Customers from the aerospace industry, amongst other types of customer, require detailed information on traceability and conformity which can be easily supplied.

Thanks to PSL Datatrack, the company knows exactly the source of all the materials that have been used for any order, which machines were used in the production process as well as details of the operation and operators involved. Supplier certificates are saved on the system and can be printed



off at the click of a button to accompany a delivery. Next in line may be a gauge calibration module which will give the company closer control over its inspection and quality control functions by providing details of calibration requirements and timings for every gauge that Hydrafeed uses.

Previously, material stocks had presented a particular administration headache. It was often difficult to ascertain exactly what stockholding levels of individual components and raw materials would be required for the company's customer base, many of whom had Kanban and Just-in-Time call-off requirements. There was also a requirement to hold stock to fulfil general customer orders. "The way that PSL Datatrack calculates and records all this information means we now stock much less material and just retain saleable stock. Orders are now flowing through the shop floor and out of the door much more smoothly," explains Martyn Page.

Looking to the future, investment in further PSL Datatrack modules will continue to meet the requirements of the growing Hydrafeed subcontract business. "We wouldn't go back now to our old time-consuming administration processes. We are in a position to win more engineering subcontract work and continue to expand our robotic and barfeed operations, confident that PSL Datatrack will allow us to succeed," concludes Martyn Page.

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Next generation manufacturing software from Seiki Systems

Seiki Systems has launched the next generation browser-based version of its established manufacturing operations management software, Seiki AIR.

Faster, easier and lighter, the software builds on the success of previous versions, delivering users actionable insights into their manufacturing activity and performance.

Seiki AIR Monitoring and WIP Booking modules come with a host of new features and live data capture and display options that provide users with the best tools for an integrated, collaborative and controlled approach to the production process. Exciting new features include a digital batch card, weekly order promise screen, first off inspection traceability, user notifications and performance dashboards on the shop floor.

A versatile role-orientated solution, Seiki AIR will provide users in any manufacturing environment with the flexibility to make fast and informed decisions. The interface has been specifically designed to be uncluttered and easy to navigate to make it easy for

users to carry out daily tasks and track progress towards performance targets. It offers users a combined view of resource and production activities in a single multi-functional, information rich workspace.

As well as rapid implementation is offers standardised machine connectivity and seamless integration with existing ERP/MRP/APS systems to ensure a fast and affordable entry point into digital manufacturing.

Seiki's philosophy is to help companies take a lean approach to their manufacturing system by offering all the out-of-the-box core functionality and support needed from a single-source. Companies can start their digital transformation with any module, an approach that allows manageable steps to be taken towards achievable targets and for the manufacturing intelligence gained to be used to inform next strategic objectives. It's an approach that has been proven by customers at all stages in their growth lifecycle and across industry sectors.

For some companies, taking a more



holistic approach from the outset is more appropriate. It allows them to benefit from the seamless, interoperability of the Seiki software modules by monitoring and managing the complete works order lifecycle. Whatever the approach, Seiki Systems provides a complete service that includes planning, installation, implementation, training and after sales support.

Seiki AIR is available now.

Seiki Systems

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www.seikisystems.co.uk/product/air

HOOPS Exchange helps Virtalis stay ahead of the game

HOOPS Exchange provides unmatched data access, accuracy, and speed to maintain data accuracy and integrity for visualising large data sets in Virtalis's flagship platform Visionary Render.

Tech Soft 3D, the leading provider of software development toolkits to engineering software companies, has announced that Virtalis is using HOOPS Exchange to create rich data sets that fuel enterprise data models that serve as the visualisation backbone for multiple types of applications across the enterprise. Virtalis is a pioneer in the AR/VR industry and provider of immersive visualisation solutions that cover the full lifecycle of the product, from conceptual design to distribution.

Visionary Render is Virtalis' flagship platform for importing and visualising large datasets from a range of sources, while maintaining all the geometry, naming hierarchies, metadata, as well as product and manufacturing information (PMI).

Virtalis is focused on supporting industrial applications and manufacturers creating large complex products for aerospace,

defence and automotive, as well as construction, geoscience, consumer goods, and more. Accurately supporting the formats used in this wide range of industries is critical because companies need to visualise large amounts of data from diverse sources. Being able to review the data in an immersive environment on a one-to-one scale, rather than seeing a 2D view of a 3D object, is effective for communicating to people who aren't skilled in CAD.

Virtalis goes beyond visualising CAD data from an external view by immersing users in the environment where the model may live, allowing them to experience the product.

HOOPS Exchange provides access to a broad range of data including B-Rep geometry, metadata, PMI, model tree, views, persistent IDs, styles, construction geometry, visualisation and more, all without depending on any CAD system. This wide-ranging access proved to be an important element in Virtalis' decision-making process.

Tech Soft 3D is the leading global provider of development tools that help



software teams deliver successful applications. Established in 1996 and headquartered in Bend, Oregon, Tech Soft 3D also has offices in California, France, England, Germany and Japan. The company's toolkit products power nearly 500 unique applications running on hundreds of millions of computers worldwide.

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Takumi takes-off with hyperMILL

A name established from the Japanese term for craftsman or artisan, Takumi Precision Engineering has been delivering both in abundance to the shores of Ireland for over 20 years. The Limerick-based company has invested heavily in recent years with a recent factory expansion that has taken floor space to 50,000 sq ft and over €5m euros invested in new machine tools and CAM software to further extend its market leading position on the Emerald Isle.

Takumi Precision is a prominent figure in the medical device, pharmaceutical, aerospace and precision engineering sectors in Ireland. The company manufactures orthopaedic implants and instruments, cardiovascular assembly aids, medical grade rasps, balloon moulds and delivery system components as well as aluminium wing, brackets and fuselage components for the aero industry and electrical, electronic, mechanical and optical engineering parts for the industrial precision machining sector.

Down the years, Takumi has invested in turning centres from Tornos, Doosan and Miyano with 3- and 5-axis machining centres from Doosan, Spinner and most recently Matsuura adding to the plant list. One of the company's core investments has been hyperMILL CAM software from OPEN MIND Technologies, driven by the onset of barrel tool technology, an influx of 5-axis machines and challenges with previous CAM systems.

Managing director Gerry Reynolds says: "Only five years ago, 90 percent of our work was in the medical industry with the remaining work being across a number of sectors including the aerospace market. We had an opportunity to enter the aerospace market in a more positive way, increasing volumes from 1 to 3-offs to continuous batches of 10-15-off on the Airbus A220, previously known as the Bombardier C-Series. We had to invest in 5-axis technology to accommodate the ramping-up of complex aerospace work and we have bought 13 5-axis machines in the last five years to support this."

The investment has paid dividends with aerospace work increasing from five percent of turnover to almost 60 percent in less than five years. However, this is not to the detriment of the medical business, as Gerry Reynolds explains: "Our business has doubled in size in the last three years due to

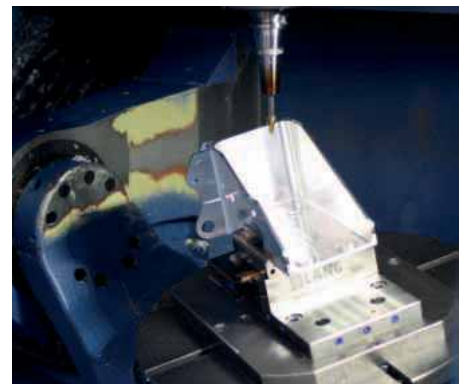


Barrel Tools being applied with hyperMILL at Takumi Precision

the increased aerospace work, but the medical sector remains crucially important to our business. Medical components are now 40 percent of our business. The volume of work has not reduced, it just hasn't grown at the level of aerospace work. We now have 87 staff and are targeting a monthly turnover of €1m euros."

"Ten years ago, I didn't understand CAM and would have argued against it. However, there was a necessity for it to run our machines and at the time I called it 'finger CAM', as we were programming at the machine. We progressed to a more comprehensive CAM system and eventually installed eight seats of software. However, a visit to the AMRC introduced us to Ceratizit's barrel tools and OPEN MIND's hyperMILL CAM system and this changed the game for Takumi."

After investing heavily in CAM software, he was apprehensive at the prospect of changing CAM systems. "Over the last five to six years, we had spent a lot on CAM packages and what we had, worked relatively well; but there were a few issues with processing speed, occasional crashes and some feature limitations. It was the barrel tool machining features within the hyperMILL MAXX High Performance Strategy that appealed to me, but I wanted



The combination of hyperMILL and Barrel Tools are significantly improving surface finishes at Takumi Precision

my team to take the lead, as they would be the ones using the software."

"The team did their due diligence, taking in hyperMILL demos and then asking our existing CAM vendor if the barrel tool feature and the mirroring package were available. Our CAM supplier and other vendors all said 'it's on its way' or 'it's in development' regarding more than just these two features in hyperMILL. That told us all we needed to know about the various vendors in the market, but it told us a lot more about hyperMILL. They are clearly streets ahead of the other CAM developers. We have rapidly moved to hyperMILL. We bought our first seat 18 months ago and now we have six seats of hyperMILL. We are now phasing out our previous CAM system."

The benefits of hyperMILL

The primary reason Takumi Precision invested in hyperMILL was the potential of barrel tools to significantly improve productivity. "The hyperMILL MAXX Machining High Performance Package and the respective barrel tools with their innovative geometry allow us to step-down 5 to 10 mm as opposed to 0.4 to 0.8 mm when finishing pockets, walls or profiling features," explains Gerry Reynolds. "This has instantly reduced finishing cycles by at least 70 percent, giving us a minimum overall cycle time improvement of 30 percent on every component."

However, the benefit is not just the cycle time improvement. "We have historically had a number of staff undertaking finish polishing of parts to ensure our surface

finishes exceed customer expectations. Despite the increased speed and step-over rate with hyperMILL MAXX High Performance Machining, the surface finishes are much better than before. This is because the barrel tool has a higher engagement rate that keeps the tool in constant contact with the workpiece."



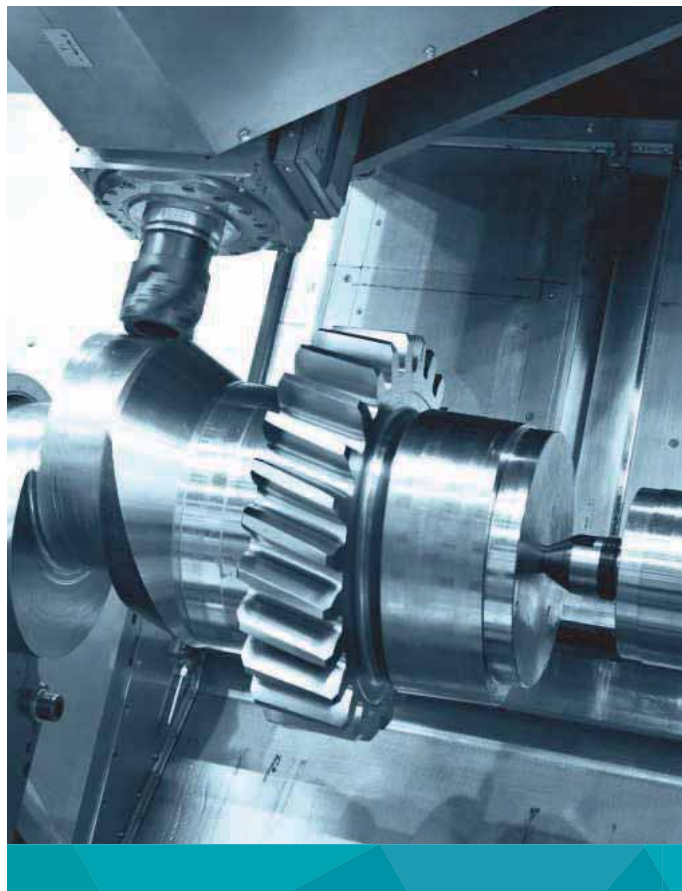
hyperMILL is slashing cycle times on complex parts at Takumi Precision

Another feature that persuaded Takumi Precision to invest in OPEN MIND was the mirroring feature: "In the aerospace industry, almost everything is manufactured with a left- and right-hand component. The mirroring feature in hyperMILL is remarkably comprehensive and with just a touch of a button, we are reducing our programming times on most components by 50 percent. We have eight programming staff and the mirroring feature in hyperMILL is effectively doubling the productivity of this team."

Better overall CAM system

While hyperMILL has reduced cycle times on the shop floor by over 20 percent and reduced programming times by upwards of 50 percent in the office, the benefits reach much further. "hyperMILL is much faster than previous CAM systems and it handles 'big data' much better than we have previously witnessed. This has eliminated unforeseen PC crashes and massively improved the reliability, processing and delivery of our data to the shop floor. Furthermore, hyperMILL has so many 'obvious' features and shortcuts that generate savings for the end user. These features don't appear on other CAM platforms. One feature that simplifies the throughput of programs and parts is hyperCAD. The OPEN MIND CAD system that is integrated into hyperMILL is an excellent platform that has now eliminated our reliance on CAD packages like Inventor. We can now expedite jobs through hyperCAD to hyperMILL with seamless ease, yet it's another feature that is making life easier for our programming team," concludes Gerry Reynolds.

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QUALITY DRIVES PRODUCTIVITY

Hexagon Production Software is the world leader in CAD / CAM solutions. Our portfolio is completed by our software solutions for aiding the design and manufacturing process in specific sectors of the industry. The company's world-renowned products include ALPHACAM, CABINET VISION, EDGE CAM, Machining STRATEGIST, PEPS, RADAN, SMIRT, SURFCAM, VISI, FASYS, NCSIMUL and WORKNC, along with the production control MRP system JAVELIN.



HexagonMI.com

True surface quality with Tebis CAD/CAM software

Andrew Walters, application engineer at Tebis UK discusses how Tebis CAD/CAM software is helping customers to achieve high quality surface finish

Quality assurance is an important part of every manufacturing chain. That's why Tebis provides all the necessary functions, right from the start.

High quality surface finish is one of the key benefits of Tebis. Most CAM systems create triangulated meshes for surfaces in the background and machine against those. This will result in for certain some inaccuracy in your machining and difficulties for high quality surface finish. Triangulated meshes are also unable to generate true curves or sharp edges.

With Tebis, it is possible to machine on True Surface model without triangulation while 3D toolpath can also be generated on triangle meshes, giving the maximum flexibility whilst ensuring the best surface finish possible.

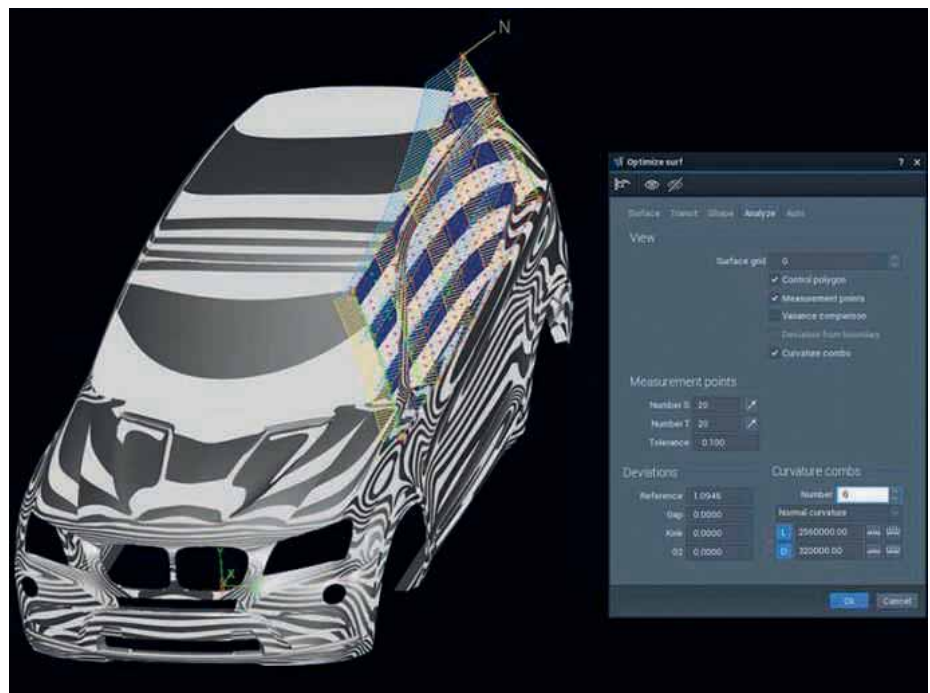
In addition to True Surface machining, Tebis maintains a strong emphasis on machining surface finish quality with a few more key and unique technologies, such as user controllable point distribution, support for full forms of tool geometry, advanced machining toolpath strategies, as well as utilising automated surface and curve repair. All of these technologies help to produce consistent high accuracy and high-quality surface finishes.

True surface

Most CAD/CAM software companies can only generate toolpaths on triangulated meshes which may not be as an effective way to produce a precision and high-quality surface finish. This is because surfaces contain true curvature, whereas mesh data gives a triangulated file with lots of small straight edges. On the actual surface finish, it will be visible to see the triangle patches on the part surface and most of the time the part finish might not be good as expected. Some workshops may decide to manually correct the finish.

Point distribution

With Tebis, it is possible for the user to control the point distribution across a 3D



machined area. This is very important when machining against fine detail or a precise feature within a surface area. This can be easily achieved by the user within the programming operation.

"We have a number of options for the point distribution and can manipulate points to highlight certain areas to improve surface finish and to improve sharp edges."

Point distribution options allow a more detailed calculation of toolpath to emphasise feature edges on part surface data. Tebis software also has specialised functions to analyse topological and geometrical defects, highly segmented surfaces and unnecessary surface patches.

Precise tool geometry and advanced tooling library

Precise tool geometry support and advanced tooling library is the ability to predefine cutting conditions such as, speeds, feeds and cut depths with the actual tool geometry. These can be referenced against specific machines, materials and operation types to create the most consistent tool conditions no matter who,



what or how you are programming. Tebis is also capable of programming using circle segment tooling which gives a high time savings and potential improvements in surface finish.

Advanced auto surface and curve repair

Tebis adds very easy to use functions for curve and surface repair to make sure it is giving the best possible results from the machining operations.

For more information, visit Tebis UK at Advanced Engineering 2019 Stand I42. Release 7 of Tebis CAD/CAM Version 4.0 and ProLeS MES Version 4.0 software solutions will be available for live viewing throughout the duration of the show.

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The trace is on

With product recalls at an all-time high, companies across the manufacturing supply chain are under pressure to improve product traceability.

The number of product recalls has shot up over the past six years and manufacturers are now far more likely than in 2013 to call back defective products, while in the EU car recalls are up 150 percent. One recent example is car manufacturer BMW, which in October 2018 recalled more than 268,000 diesel engine models in the UK over a potential fire risk caused by a leaking part.

According to insurance group AGCS, recalls due to defective products or workmanship have caused losses in excess of \$2 billion world-wide over the past five years. Overall, the average size of an insurance claim for losses related to a product recall is €851,000, but major recalls can cost significantly more. The insurer's analysis of 367 events showed that major recalls in the automotive industry led to average insured losses of €12.4 million, for example. The ten largest claims in the study accounted for more than half the overall losses, and automotive and industrial companies made up more than 70 percent of claims by value.

The full costs of a recall can be difficult to quantify and may be much larger than insurance industry figures suggest. Beyond the direct expenses associated with locating and rectifying or replacing faulty products, companies involved in major recalls will also have to deal with knock-on effects, including reputational damage and the loss of customers to competitors.

The traceability imperative

Efforts to limit the occurrence and impact of quality-related issues is driving a desire to improve traceability at the component level. Understanding exactly which components have been used in which products doesn't eliminate the risk of quality problems, but it can transform a company's ability to respond to issues when they occur: limiting the scale and scope of recalls and corrective actions and aiding the identification and elimination of root causes.

Full component traceability has been standard practice in the aerospace sector for many years. As demand for the same capabilities expands into other industries, subcontract manufacturers are increasingly



facing the need to upgrade their processes and equipment to meet customer requirements.

Introducing traceability capabilities into manufacturing operations can seem a daunting prospect, but Pryor Marking has developed a comprehensive range of solutions applicable to all material types and manufacturing volumes. All products are designed and manufactured in the UK, enabling a unique level of expertise and support for UK manufacturers and suppliers

Mark

Every component traceability system relies on two fundamental components: marking and data recording. The process begins with a specially designed marking device giving raw materials and parts a unique identification tag, which can be a barcode, typically in 2D or Data Matrix format, or permanent readable texts and images.

Where marking devices are concerned, dot peening, which 'prints' text, lines or images on components as a series of closely spaced dot indentations, continues to be the preferred method for marking unique data matrix codes for machine readable



identification. It is also suitable for critical parts, where permanent legibility is important and surface flaws are unacceptable.

For some applications, scribe marking or engraving is used as an alternative to dot peening. The process is slower, but can produce a more aesthetically appealing mark, which may be important in consumer-facing applications. Where a non-contact method is preferred, laser marking offers an alternative to dot marking, providing a high contrast mark on a wide variety of surfaces and substrates.

Marking equipment is manufactured in a range of different form factors. Hand-held machines, for example, are ideal for low volume applications or where the marked component is large and immovable, or a variety of marks are needed in multiple locations. The range of handheld marking equipment from Pryor covers all requirements; from a small, fully portable power tool to heavy duty, industrial units ideal for manufacturing lines, foundries, and as back-ups to automated systems.

The pneumatic versions of Pryor's portable dot markers are the lightest weight, deep marking tools available on the market, ideal where a painted or coated mark needs to be applied to a large component. All Pryor marking units are robust, with electronics carefully protected from the vibrating marking head. Laser marking can also be configured into a hand-held system for larger components.

For higher volume applications, marking equipment can be integrated directly into

manufacturing lines. Marking heads can be installed in a fixed location or mounted on a robot for increased flexibility. For high-speed production lines, on-the-fly laser marking systems can apply an accurate mark to a moving component.

Track

The second key component in a traceability system is appropriate software to associate each mark with the relevant component, sub-assembly or final product. Pryor provides a full range of scanning and verification tools for this purpose. Using advanced computer vision technology, verification systems check not only that the right mark has been applied, but also that the mark meets appropriate quality standards. Data from the system can be exported to internal or end customer manufacturing and product data management systems.

Improve

As many companies have found, introducing traceability doesn't just keep customers happy, it can also help to streamline internal process and quality control. Based on decades of experience working with



manufacturers, Pryor has developed an advanced software solution that uses product marking as the foundation for mistake proofing, quality control and process compliance.

Pryor traceability software tracks the specific components used in complex assemblies, for example. That streamlines data management and makes recall actions and the tracking of quality escapes quick, efficient and cost effective. The system can record and associate other manufacturing data, such as critical process variables, with individual components and assemblies, aiding quality improvement and root-cause problem-solving activities.

Pryor traceability software doesn't just help manufacturers fix problems it can also prevent them. The system can be used for error-proofing, by stopping a process or alerting operators if all the required

components are not present in an assembly, for example. It is also possible to enforce standard operating procedures using the system, for example requiring operators to periodic tool, equipment or process checks.

Pryor Marking Technology is a world leader in the manufacture and design of both traditional and innovative marking, identification and traceability solutions.

Founded in 1849 in Sheffield, UK, a hub of manufacturing and the birthplace of stainless steel, the company's success is built on providing solutions for all manufacturing industries, with extensive expertise in aerospace and automotive standards.

Operating from sites in the UK, USA, France and India, Pryor serves an extensive customer base, supported by a comprehensive distributor network in countries across the globe. For more information, contact:

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TLM's vision for laser marking

The laser marking process is firmly established as the first choice solution for part identification and traceability purposes across many diverse markets and applications. The traditional approach to laser marking applications usually involves accurately locating the part in a fixture to ensure correct mark alignment.

This can mean added costs for the specific part fixtures required and extended setup times during part changeover. However, introduce a Through The Lens (TTL) vision system into the equation and the laser marking process becomes simpler and easier to use, more flexible, and delivers greater levels of functionality and process efficiency.

This article by Andy Toms of TLM Laser, UK and Ireland distributor for FOBA Laser, explains why the introduction of patent pending machine vision technology into FOBA's laser marking systems has not only changed the traditional view of laser marking, but provides users with a modular approach to the process and significant quality and efficiency benefits.

The concept of Through The Lens (TTL) vision is self-explanatory; the camera views the marking field directly through the laser

optics. The introduction of the machine vision system provides both a number of options and a modular approach to marking for users of FOBA's laser marking technology, with the capability to add staged functionality as and when required. Also, each of the different stages available to users, described in more detail within this article: "Point & Shoot", "Intelligent Mark Positioning" and "MOSAIC" have auto focus included, plus the option of verify to read back 2D codes, unique offerings from FOBA.

The starting point of FOBA's vision or camera-aided laser marking is Point & Shoot™, which allows the user to manually position and orientate the mark contents on the product to be marked. The Point & Shoot camera system views the marking field through the lens and creates a WYSIWYG image of the component, displaying it in the user interface. The user creates the mark to be produced and then positions it, via 'drag & drop' at the exact position on the product where it is to be applied. This camera-aided laser marking process reduces the number of defective products and increases economic efficiency and productivity, as the marks are applied at



FOBA's Through The Lens Vision offers distinct advantages over external camera based systems

the desired location and in the specified manner.

The next stage in FOBA's modular approach is their patented Intelligent Mark Positioning (IMP) high-speed camera system. This automatically detects work pieces and their position before aligning the mark or engraving accordingly, ensuring precision and repeatability. IMP consistently provides premium-quality marks and therefore delivers a measurable reduction in the number of defective products.

Intelligent Mark Positioning is ideally suited for automated volume production, especially in relation to the aerospace, automotive and electronics industries, and of course the medical technology sector. Intelligent Mark Positioning also offers optical verification and inspection functions at both the pre and post process stages. Prior to marking, parts are checked to determine if they have already been marked and post processing, the marks are checked to determine whether they are accurate in relation to position and alignment. A further check is used to verify that all of the information that should have been applied is actually on the part.

Fixtureless Marking using MOSAIC

The ultimate in today's laser marking technology is the patent pending MOSAIC feature from FOBA. This addresses the key challenges of accurately aligning marks on even large parts, irrespective of the part



TLM Laser offers a range of FOBA laser marking systems which have the option for TTL Vision

position and orientation. MOSAIC uses the internal camera of the laser to create an image of the marking field by simulating a straight down camera view. This natural straight-down view from inside the laser provides an imaging field as large as that of the laser marking area. The benefit of this configuration is that it eliminates the need for external cameras, which can sometimes cause inaccuracies linked to perspective.

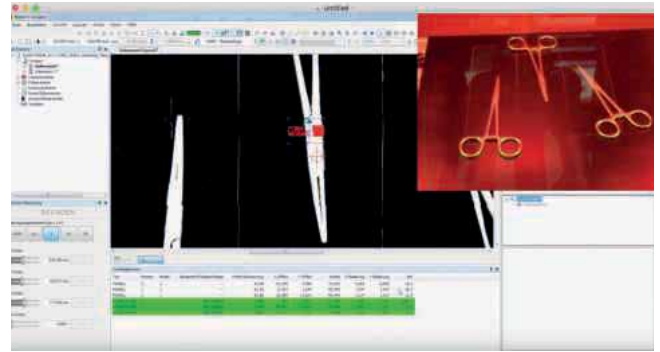
This new patent-pending software feature is a powerful step forward in vision-based laser marking, speeding up both the component handling and laser-marking processes whilst reducing overhead costs. With FOBA's MOSAIC system, the camera is used to capture multiple small images and then arranges them into a single large image, just like a mosaic. This image is then used for system training, job setup, part validation, pre-mark verification and mark alignment.

Once the system has been trained for a particular component, using MOSAIC is extremely simple. Within a matter of seconds of the part being presented, which can be anywhere in the marking field, the images are acquired, the laser-aligned and

the laser-mark generated with the highest levels of precision. For manufacturers across all sectors, the benefits are clear. Using the MOSAIC system means significant cost savings in the design, manufacture and maintenance of industrial fixtures.

Other cost savings are generated through the ability to run mixed part variants at the same time. For example, a range of different part types could be presented to the marking system randomly on a conveyor, eliminating the need for any additional hardware to re-orientate or repositioning the parts. As long as the parts are placed anywhere within the marking field, the system will determine the position and orientation prior to accurately producing the mark required.

By integrating machine vision within the laser, FOBA's flexible approach to marking allows users to choose the level of technology most suited to their business



FOBA's MOSAIC feature enables True Fixtureless Marking

and applications. The modular nature of the system makes it easy for users to add extra functionality at a future point if required, through software upgrades.

TLM Laser is already recognised as a leading UK supplier of laser-based technologies for marking, engraving, welding, cutting, cladding, cleaning and 3D metal printing.

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Technifor provides precision laser marking for Ashton Jig and Tool

Established in 1958, Lancashire-based Ashton Jig and Tool Company Ltd is renowned across the UK for creating precision engineering solutions of the highest standards. When current managing director, Jon Clifton took over running the business from his father in 1986, he began an investment programme in CNC machinery that has seen Ashton Jig and Tool become a key supplier of bespoke components to organisations across the oil & gas, automotive, aerospace, pharmaceuticals, food, hygienic processing and nuclear energy sectors.

Today, Ashton Jig and Tool's capabilities include CAD, temperature-controlled inspection, wire eroding, electro discharge machining, conventional milling, full 3-D 4-axis CNC milling, conventional and CNC turning, jig boring, grinding, sawing, drilling, tapping, pressing and engraving. Following the recent purchase of a Technifor Class 1 LW3 Laser Workstation from Technifor Ltd, part of the Gravotech Group, the company is now also able to offer high quality, high-speed marking on metals, ceramics and plastics.

"Some may view my approach to investing in new manufacturing technologies as unconventional," comments Jon Clifton. "That's because, unlike those business owners who wait until they have a specific need for a new machine, when I see a piece of equipment that I think will be of long-term benefit to the business, particularly in terms of sub-contract work, I tend to go for it. With our extensive customer base, reputation for accuracy, and commitment to delivering value for money, I find it's not too long before a new machine is fully utilised."

Jon Clifton's decision to invest in a Technifor Laser Workstation was the result of similar reasoning and, although the Technifor machine has only been in place for a few months, it is already generating considerable levels of interest.

"Earlier this year," he says, "I was asked to quote for engraving part reference and drawing numbers on a range of small bronze components. With only a manual engraving capability on site at the time, I had no option but to outsource. Not only was the 'in price'



quoted to me far in excess of what I would consider charging our customer, the completed job didn't meet the high standards that I set for everything we do at Ashton Jig and Tool.

"Seeing the potential for laser engraving, I approached two manufacturers for advice, one of which was Technifor. Not only did Technifor's machine represent better value for money and better suit my needs, the support and information provided by their technical sales engineer Simon Tims was outstanding. Simon also ensured that my chosen machine was installed promptly, all in good time for me to fulfil the originally outsourced task in-house."

With advice from Simon Tims, Jon Clifton decided to purchase a Technifor LW3 Laser Workstation equipped with Technifor's F20 (20 watt) Fibre Laser marking machine. The LW3 workstation was chosen for its ability to accommodate larger components, while the F20 laser marking machine was selected for its capabilities in precision-marking an

extensive range of often-intricate metals and ABS plastics. To enable cylindrical objects to be engraved, the machine was specified with an optional 4th axis, a rotary attachment that allows for the marking and engraving of cylindrical parts.

"Extremely user friendly, our Technifor machine was installed in under a day and is located in its own clean-room environment," says Jon Clifton. "The quality of the marking is outstanding and will be particularly ideal for traceability and logo marking. In fact, we have already secured a significant order that is subject to 100 percent component inspection. I have no doubt whatsoever that the machine will deliver."

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The mark of success

How to turn a small and medium-size company into an intermediate-size one in two years

SIC Marking has been chosen by Salvéo Group to introduce the topic "How to turn a small and medium-size company into an intermediate-size one in two years" on the occasion of its website and YouTube channel www.fabricantsdecroissance.com going live.

Sic Marking general manager Jean Manuel Pauchet says: "It is an honour for SIC Marking that comes as a reward for all the daily efforts made by their teams throughout the world to be an increasingly customer-oriented and competitive player."

"This success has been achieved thanks to the cultural evolution that SIC Marking has led, particularly with operational excellence practices. The goal was to place clearly the clients at the heart of processes, understanding what was prominent to them and then, progressively eliminate waste. The word "Kaizen" represents a real state of mind and comes from the Japanese meaning a "change for the better".

The involvement from all in Gemba or daily management meetings, both within manufacturing floor and services department, has allowed us to achieve our level of excellence.

"The basis of improvement at SIC MARKING is now driven by each of the employees, in every part of the company and every day. In addition to the operational performance aspect, the human and the teams are also a priority in our culture change."



This recognition has been highlighted in a video where Jean Manuel Pauchet explains what makes SIC Marking so unique in its market and gratefully praises the results of all SIC Marking's employees.

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Metrology service provider expands with second LK CMM

Contract inspection and reverse engineering capacity has doubled in terms of throughput, while the size of component that can be measured has increased more than five-fold, at Laser Scanning Ltd, based in Chapeltown, near Sheffield. This follows the installation of a second, larger coordinate measuring machine (CMM) built by LK Metrology at its Castle Donington factory.

The latest LK 20.12.10 ceramic-bridge CMM with 2,000 x 1,200 x 1,000 mm working volume has joined a smaller 8.7.6 model. When Laser Scanning's managing director Johnathan Rigby started the company in September 2016, he brought the original machine with him from his previous employer, PMS Diecasting in Rotherham. This firm now subcontracts much of its metrology requirement to Laser Scanning, both companies being members of the Glide Group, along with plastic injection moulding specialist Loadhog, toolmaker GoTools, and wire joining and tensioning product manufacturer Gripple.

As the inspection provider's name implies, most data acquisition is by laser scanning on both the LK CMMs as well as on two articulated arms supplied by Nikon



Laser Scanning's managing director Johnathan Rigby with the LK 8.7.6 CMM

Metrology. All the equipment is housed in a temperature-controlled room held at $20 \pm 1^\circ\text{C}$ in the Chapeltown facility. Parts delivered for inspection are acclimatised in the same room for 24 hours to reduce measurement uncertainty.

Three types of non-contact sensor from Nikon Metrology are in use on the CMMs: an XC65D cross scanner and line scanner models L100 and LC15Dx, which respectively have 13.0, 6.5 and $1.8 \mu\text{m}$ measuring accuracy. The latter provides performance equivalent to tactile probing, which is also utilised by Johnathan Rigby and his team for capturing physical dimensions, such as hole diameters, using a TP20 touch probe and an SP20 scanning probe, both from Renishaw. A changing rack mounted on the CMM table allows automatic sensor exchange within an inspection cycle.

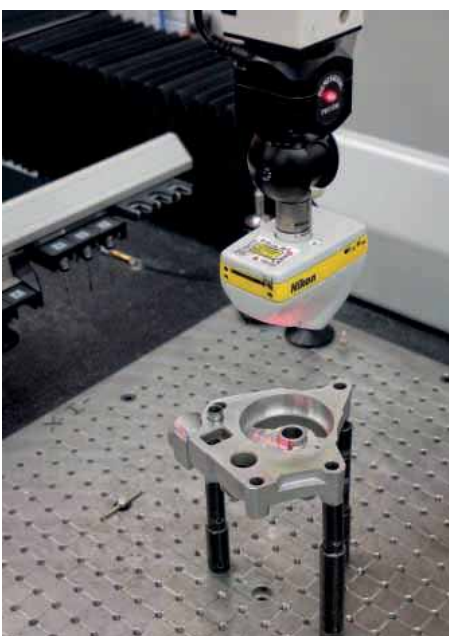
What prompted the purchase of the larger CMM was the receipt from JCB Power Systems in Derby of a contract to assist with quality control (QC) of cylinder blocks and heads for the engines that power the OEM's off-road vehicles. JCB has its own LK machine equipped with a touch probe that serves the production line in Derby. Laser Scanning assists by providing measurement

and inspection of goods-in to the plant, where it has a QC engineer permanently stationed.

Additionally, the Chapeltown centre helps with preparing CMM programs and proving them out, as well as inspecting prototypes to support JCB's research and development department. Especially for the latter purpose, the service provider is able to furnish much more comprehensive and accurate information about a new component than is possible using touch probing techniques at JCB Power Systems.

Although the engine plant does have laser scanning capability on an articulated arm, the level of detail that can be acquired is less, as its scanning resolution is $23 \mu\text{m}$, much lower than the best CMM-mounted scanner in use at Laser Scanning's offices in Chapeltown. In any case, inspection using an arm would be a manual process and almost impossible to replicate on subsequent occasions, whereas running a program on a CMM is automated and highly repeatable.

Johnathan Rigby explains: "By working with JCB's Inspection department and R&D team, we have been able to free up our customer's machine to concentrate on production QC. They also appreciate the greater detail we can provide about new



An aluminium oil pump housing being inspected by laser scanning on the LK 8.7.6 using the high resolution LC15Dx Nikon sensor

prototypes, as laser scanning allows us to show them the form of a component as well as supply measurement data.

"For example, they recently asked us to help them with a new rocker cover housing that had been plastic injection moulded to determine whether the gasket area was within tolerance after shrinkage in the manufacturing process.

"Inspecting a planar surface such as the gasket area by touch probing at multiple points would not give an overall idea of its flatness and in all probability if the exercise were repeated the results would be different.

"In contrast, scanning generates millions of points to give a detailed 3D picture of the entire surface to a very high level of precision and the deviations can be quantified. It enables JCB to show its mould tool supplier exactly where any inaccuracies are."

The Chapeltown metrology company is ideally placed to help any manufacturer that uses LK measuring machines and software, as work and programs can be transferred seamlessly to run on either CMM. Projects have involved a Tier 2 supplier in the Midlands to the global aerospace industry, which used Laser Scanning's subcontract services for inspecting components while their own machine was out of action; and a medical equipment manufacturer that wanted to verify its in-house QC capability. Operator holiday cover is another regular source of business.

About half of Laser Scanning's turnover is derived from reverse-engineering legacy



A plastic injection moulded rocker cover from JCB Power Systems' R&D department in Derby being inspected in Chapeltown using the cross scanner

components for which models and drawings do not exist. Machine shops and toolmakers are frequent customers and the company also provides a service to designers. A recent job entailed taking sketches for the frame of a new downhill mountain bike developed by Stewart Palmer, director of F1 subcontractor North Bucks Machining, and creating a 3D CAD model so that the frame elements could be produced on one of its machining centres. The contract machinist is also an LK CMM user.

The latest version of LK CAMIO software, version 8.5, is in use at the Chapeltown facility. Featuring interoperability across CMM platforms and sensor technologies, it is designed to create efficient inspection programs for measuring geometrical features and evaluating surfaces using

advanced point cloud analysis, with part-to-CAD comparison and full reporting capability.

Johnathan Rigby concludes: "CAMIO software has a Microsoft Office feel to it, with a similar, customisable icon ribbon at the top of the screen. It is very user-friendly, as programming functions are easily accessible and not buried within drop-down menus.

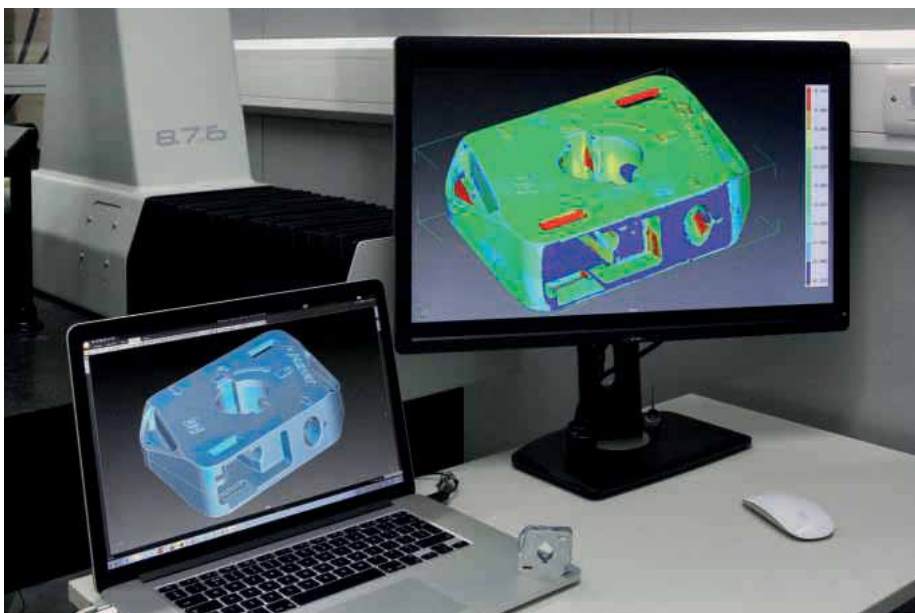
The new version interfaces with our Geomagic software from 3D Systems, allowing us to create accurate models from 3D scan data as well as use it for QC and measurement.

LK Metrology is renowned for innovative CMM hardware and software solutions. The company's metrology products are used worldwide to control and improve the quality of manufactured components. Its precision technology underpins the process chain from design, development, production and assembly through to quality assurance in global industries such as automotive, aerospace, defence, motorsport, energy, medical and contract inspection.

Established in England in 1963, LK Metrology has an impressive heritage in metrology dating back to the birth of CMM technology. Founded by CMM pioneer Norman Key and his father-in-law Jim Lowther, LK Metrology is credited with many of the CMM industry's firsts including the first bridge-type design, first OEM to integrate computers, first to use a touch trigger probe, first to develop inspection software, first to use all air bearings and granite guideways, first to use carbon fibre composite spindles, first to use microprocessor-controlled drive systems, first to produce a truly thermally stable CMM and first to produce a high-accuracy horizontal-spindle CMM.

In 2018, LK Metrology was relaunched as an independent CMM manufacturer after several years as a division of Nikon Metrology. Headquartered in the UK, LK's CMM development and production are at the company's facility in Castle Donington. Sales and support offices are located in the UK, North America, Belgium, France, Germany, Italy and China, supplemented by a worldwide distributor network.

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LK CAMIO displaying a scan-to-CAD comparison on the right-hand screen and the nominal CAD model on the left. The component is a die cast Gripple housing

Optical measurement investment benefits customers

A precision subcontract engineering firm established almost 70 years ago, David Paull (CNC) Engineering has built a strong reputation for delivering quality products. The often-critical components the company machines are used across the marine, aerospace, defence, oil and gas, pneumatics, medical, leisure and tourism sectors, meaning form, function and safety cannot be compromised.

Operating on both a large and small scale, the Cornwall-based company prides itself on its fundamental philosophy of offering a tailored, state-of-the-art engineering service to clients, where accuracy is paramount. While the business's values have remained a constant guiding light, it retains strong ambitions for further development and growth.

DP Engineering's Philip Anthony says: "Being in the subcontract business, if we don't keep on top of new technology then we get left behind. As a company we always continue to try to invest in technology and, at the end of the day, offer a higher standard of service to our customers."

One key area identified by DP Engineering as prime for improvement was the quality control side of its operations. Due to the complexity of its products and the materials required to make them, the company has in the past been heavily reliant on manual inspection methods.

The time-consuming nature of this traditional approach was proving a major concern for a business with aspirations to increase its capacity and productivity. In addition, the subjective nature of manual measurement brings with it the risk of inaccuracy, as the process is neither repeatable nor quick enough to be applied to anything other than batch sampling.

To help meet its objectives, DP turned to VICIVISION UK, the leading supplier of



optical, non-contact, turned-part measurement machines and quality control systems across the UK and Ireland. It installed the M309, a shop-floor ready system with wide measuring fields, impressive load capacities, high-resolution capabilities and intuitive software, designed to measure cylindrical components quickly and with absolute precision in the heart of the production environment.

Philip Anthony continues: "We're seeing the benefits on components which have a lot of external features. Whereas we used to have to check on different bits of kit, such as external lengths on a shadowgraph, contracer and height gauges, now it can all be done on one machine.

"There are features you can measure on the VICIVISION that you can't measure on a CMM, so we use them in parallel. It's aided our production. We make our money from cutting metal, so any down time is a no-go, and the VICIVISION machine has certainly reduced our down time."

Part of the VICIVISION Techno range, the M309 makes immediate inspection available next to multiple machining centres, to more than one operator, eliminating bottlenecks and leading to a reduction in idle time as there is no need to leave the production environment.

Its superior and automated high-resolution video camera technology carries out a number of checks on a

single setup, eliminating the need for multiple specific manual instruments. Even the most complex parts can be inspected in a matter of seconds, down to the last-minute detail. Fast, non-contact, non-destructive measurement on an all-in-one system is done at the touch of a button, with fast and efficient batch changing contributing to greater throughput.

Philip Anthony adds: "The biggest thing for us is the in-process inspection, where you could do a sample size before, but now you're not limited as to how long things take. There's no issue with running a whole batch, let alone sample parts.

"It enables you to complete things a lot quicker and consequently we're able to offer a more competitive price. Nothing can leave this building without being inspected, so our inspection department has grown, which is key to DP and the quality performance that we try to aim for.

"We asked ourselves how we were going to reduce our setups and down time. The VICIVISION machine has enabled us to reduce offsets and first-off inspection reports."

The efficient, accurate and reliable measuring processes made possible by VICIVISION systems give manufacturers total peace of mind when it comes to the repeatable supply of quality products.

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New Trimos Portable Measuring Arm now available in the UK

As the sole distributor for Trimos products in the UK, Bowers Group has introduced the new range of Trimos Portable Measuring Arms. The A-line portable articulated measuring arms are extremely easy to use and both flexible and accurate in the scope of 3D measurements.

The Trimos entry level A3 portable inspection arm allows inspection and verification of small to larger parts, and the 6-axis configuration is available in both 1,300 mm and 1,800 mm measuring range. The carbon fibre construction and aluminium mount makes the A3 arm a very stable and light structure to operate with an included counterbalance. Trimos Portable Arms are also available with measuring ranges up to 9,000 mm.

UK sales manager for Bowers Group, Martin Hawkins says: "We are delighted to introduce the Trimos Portable Measuring Arm to the UK market. It's the ideal instrument for easy, flexible 3D measurement, ensuring reliability, repeatability and, most of all, accuracy. The carbon fibre structure ensures stability,

enabling easy quality control, inspection or verification of small and large size parts."

This easy-to-use portable measuring solution is fitted with Aberlink Software, which is already used on the Baty range of vision systems and projectors. The A3 arm also boasts mechanical probes with 4 mm ruby sphere, an internal temperature sensor and 20 mm calibration sphere with magnetic support.

Certified according to the ISO10360-2 standard, the range includes additional models to the entry level A3 arm, including A4, A5, A6, A7, A8, A9 and AT models, available depending on the requirements of your application.

Trimos has been a leader in the field of dimensional metrology since 1972, guaranteeing 'Swiss-made' quality from its manufacturing. Trimos offers a range of solutions that respond to dimensional measurement needs, combining high precision, innovation, advanced design and ease-of-use.

As sole UK agent, Bowers can exclusively offer its customers the full range of Trimos



height gauges, horizontal measuring instruments and surface analysis instruments, along with the new range of portable measuring arms.

To find out more, speak to a member of the Bowers team, or to receive a demonstration, contact:

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Integrated wireless hand-held metrology portfolio expanded

Two new small and universal depth calipers and new micrometers for special applications in five variants now complete the product families of Integrated Wireless handheld metrology.

Due to its compact size and precise workmanship, the new MarCal 30 EWR(i) caliper gauge for small depths is suitable for a variety of measuring tasks up to 25 mm. Whether measuring small bore depths or narrow spaces, this small depth caliper is ideal for mobile use in production or assembly. Despite its compact size, the proven large display with a digit height of 11 mm ensures fast, error-free reading.



Similar to the new small depth caliper, the universal depth caliper 30 EWR-U/ 30 EWRi-U is the latest addition to our Integrated portfolio. Exchangeable styli allow for an easy and flexible changeover to the measurement different interfering contours, recesses, undercuts, etc. The universal depth caliper is available in the measuring ranges 300 and 500 mm as well as optionally with integrated wireless radio transmission and in the classic version with cable interface.

The new Micromar 40 EWR(i)-X micrometers are available in five variants for various typical special applications such as narrow measuring points, tube wall, recess and crimp height measurements, as well as measurements using interchangeable measuring inserts (thread flank, ball and roller inserts). With the addition of these variants for special applications, almost all conceivable measuring tasks can be mastered with Mahr micrometers. The Micromar special micrometers are also optionally available with data transmission via Integrated Wireless System or classic cable connection.

The Integrated Wireless families
 Measurements with the hand-held gauges with Integrated Wireless from Mahr are flexible and uncomplicated. Particularly the user-friendly operation, namely the reliable transmission of measured values by radio and without interfering cables, is appreciated in production environments as well as in the area of quality assurance: no matter whether for length, width, inner diameter or depth measurement. Due to the wireless design, all measurements can be carried out flexibly and without restrictions, regardless of the manufacturing or production environment. The integrated radio connection guarantees an optimal connection to the acquisition and evaluation program. The Integrated Wireless hand-held measuring devices from Mahr increase the productivity of quality assurance in manufacturing operations.

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Amada provides 'pulsating' performance for Barrett Steel

Established by Henry Barrett in 1866, Barrett Steel Ltd has grown to become the UK's largest independent steel stockholder. Today, the well-known group consists of four divisions with more than 40 companies operating from 26 strategically placed sites.

Barrett Steel Ltd prides itself on the high-quality processing services it offers, including shot blasting, priming, painting, drilling, laser cutting and sawing. The Barrett Engineering Steel division has seen increased business which has led to a search for a highly efficient sawing solution for two of the group's sites in the Midlands and North West.

Having considered the offerings from several leading global saw manufacturers, and in accordance with Barrett Steel's policy of investing in the latest technology, two advanced Amada PC430X/AX pulse cutting, automatic bandsaws were purchased from Accurate Cutting Services Ltd. By considerably increasing each site's sawing speed and productivity, the recently installed machines have completely removed the potential for processing delays.

When compared to conventional bandsaws, the Amada Pulse delivers significantly faster cutting by employing an ingenious mechanism to "pulse" the blade feed pressure. The generated pulse forces the bandsaw's tips to overcome any work hardening throughout the cut, the pulse also eliminates the unwelcome vibration harmonics that create noise and damage to tip material.

The highly efficient Amada bandsaw uses an intuitive Windows-based CNC Control. All functions, including the setup of the machine, are controlled by an easy-to-use touch screen. Operators can choose from a comprehensive list of parameters and once set up the saw delivers optimum cutting performance at the touch of a button. If required, the touchscreen provides an estimated job finish time, whilst a history of cutting and fault-finding information is also accessible.

A high-powered, 11 kW motor, coupled with Amada's unique pulse

cutting device, allows the PC430X/AX to maintain efficient cutting rates even when tackling the toughest of materials. In addition, an impressive blade specification of 54 mm wide, 6,100 mm long and 1.6 mm thick ensures very high beam strength, enabling faster down feeds and the delivery of outstanding cutting rates, even on high-tensile materials such as Inconel and Hastelloy.

To guarantee maximum blade and brush life whilst undertaking all categories of cutting, an automatically adjusted, double wire brush design is used. This ensures that the chip area of the blade is kept clean.

Barrett Engineering Steel Midlands, branch manager Rob Fern explained the reasons for purchasing the two Amada pulse bandsaws. "Barrett Steel has extensive experience in serving a range of demanding sectors and we work in close partnership with prominent national and international companies in the oil, gas and engineering industries, as well as construction and rail.

"To ensure that we continue to provide exceptional levels of customer service, as a company we have a commitment to technological innovation. Increasing levels of business in our Midlands and North West sites meant that we recently needed to source two new, robust, fast acting bandsaws that would increase our sawing throughput and enable us to keep pace with future demands.

"Although we considered alternative

horizontal band saws, the Amada PC430X/AX ticked all the boxes. In addition to the machine's build quality, its pulse capabilities provide the speed, especially on large diameters, and accuracy that we require. Also, it helped our decision that we have purchased Amada saws in the past and been very impressed with their performance, and we have always received excellent after sales service from Amada's agent, Accurate Cutting Services.

"Following a trouble-free installation, our new Amada saws are delivering on all of the promises made. The machines allow all our grades to be programmed and the main consoles clearly display an estimated finish time for each job, which allows the operatives to plan upcoming cuts efficiently. Also, the ability to download data related to blade performance is extremely useful for monitoring our KPIs and for helping us to constantly improve as a business.

"Although in the past we have had situations where saws we have purchased have been unable to cut to the specification quoted, this is certainly not the case with our new Amada machines, as they are able to cut efficiently right through their capability range.

"We are now using our new Amada machines to saw both our carbon and alloy grades round bars, in both black and bright bar. The new saws are also perfect for cutting our latest stock investment of EN30B. Thanks to their advanced pulse



technology and carbide blades, they are providing levels of speed, cut and finish that could not be matched by any of the other brands we considered.

"In addition to the Amada saw purchased for our Midlands business, we also bought an RT conveyor to feed the saw. The RT conveyor gives us the benefit of semi-automation and has resulted in a significant reduction in saw down time. Also, because of the autonomous operation that the Amada 430AX and the RT conveyer combination provides, when undertaking extended cutting runs, the saw can run unattended for up to two whole shifts."

Accurate Cutting Services Ltd, chairman Mark Fleeming adds: "Accurate Cutting Services has achieved over 50 years of in-depth sawing experience and now operates from two main sites in Redditch, Worcestershire and Cleckheaton, West Yorkshire. We offer customers an extensive portfolio of premium-quality, cost-effective



sawing solutions, including Amada machines, backed-up by first-class, service and repair services.

"As with all potential customers, we worked closely with Barrett Steel to fully understand the company's requirements. Given Barrett Steel's high-volume sawing throughput demands and its need for speed, efficiency and accuracy, it was agreed that the advanced Amada PC430X/AX pulse cutting automatic bandsaw was the optimum solution for the two Barrett Steel sites. Since both saws' installations, Barrett Steel have reported that, on average the saws are cutting four times faster when compared to the company's existing saws, and that they are handling higher capacities while still maintaining impressive levels of accuracy."

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Aerospace company adopts novel method for separating additively manufactured parts

To save time, weight and costs when producing metal aircraft components, Airbus Helicopters in Donauwörth, Bavaria, part of the Airbus Group employing 7,000 staff, has recently turned to additive manufacturing. The company not only develops and produces a range of helicopter models such as the H135 and H145, but also specialises in the manufacture of more than 4,000 doors for passenger and cargo aircraft every year.

To separate the titanium parts from their base plate rapidly, economically and without damage after they have been 3D printed, in October 2018 Airbus Helicopters purchased an automatic KASTOwin amc bandsaw from KASTO, also based in southern Germany. The machine, which is enclosed to prevent the ambient air from becoming contaminated and is prepared for connection to an extraction system, is available in the UK and Ireland through the firm's Milton Keynes subsidiary.

The Donauwörth factory additively manufactures titanium shafts for locking aircraft doors using the layer-by-layer powder bed method. Sixteen of the components are installed in every Airbus A350, for example. The walls of the shaft are thin and have a complex geometry, making

3D printing a particularly suitable production method. It cuts costs by 25 percent and results in a weight saving of more than 45 percent, or four kilograms per A350 aircraft, compared with the previous production process.

When printing of the components is finished, they must be separated from the 400 mm x 400 mm titanium baseplate, a function that the KASTOwin amc has been specifically designed to perform. The base plate with 3D printed shafts weighing up to 40 kg is transported from the 3D printer by forklift truck to the saw and bolted securely to a clamping mechanism.

The machine door closes and the mechanism rotates through 180 degrees so that sawing of the components to remove them from the base plate is performed upside down. This design offers considerable advantages in additive manufacturing as after being cut, the parts cannot topple over or buckle, preventing the risk of damage that could lead to time-intensive reworking or even expensive scrap.

As the plate is ground flat after each build so it can be repeatedly reused, it becomes progressively thinner. So before sawing begins, an employee has to measure its thickness when clamped and enter the figure into the job wizard of the AdvancedControl CNC. The bandsaw blade, actuated by a high-precision ballscrew drive, then moves precisely to the programmed height. When cutting is complete, the shafts fall into a padded container to prevent damage and are removed through a flap.

Before opting for the KASTO machine, Airbus Helicopters conducted trials at the saw technology specialist's premises in Achern and were impressed by the results. Bandsawing was achieved easily, rapidly, accurately and significantly more



Airbus Helicopters uses a KASTOwin amc bandsaw to separate additively manufactured components from the base plate



Bandsawing is performed in the KASTOwin amc with the workpieces inverted to prevent damage to the expensive 3D printed parts after their separation from the base plate

cost-effectively than by alternative machining methods, such as milling or wire cut EDM (electric discharge machining).

Additive manufacturing of other metal components is planned at the Donauwörth factory, so the KASTO saw will play an even more prominent role in production in the future.

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A batch of 3D printed titanium shafts for locking aircraft doors being delivered by forklift truck to the KASTOwin amc

New KKS 400 U circular saw from KALTENBACH

The KKS 400 U semi-automatic mitre saw is the latest universal genius from KALTENBACH, first unveiled at the German manufacturer's in-house IPS Show last June.

The saw can machine virtually all types of profile and solid material as well as a very wide range of steels. By increasing the output of the hydraulic unit compared with the previous model, the designers at KALTENBACH have doubled the speed of the saw blade return. A long stroke clamping cylinder minimises setup times and the new push-button control system makes it very easy to operate. Clamping, sawing, clamp opening and saw blade return can all be done at the touch of a button. Furthermore, a wide range of accessories for material feed and length measurement is available.

In addition to semi- and fully automatic circular saws, the KALTENBACH product portfolio also includes various types of band saw. Features include: saw blade: Ø 400 mm; mitre cuts +/- 90 degrees; high output capacity of the hydraulic unit; hydraulic long-stroke clamping cylinder; easy

operation via push button; clamping, sawing, reverse motion, opening at the touch of a button; suitable for single cuts and processing small batches; push-button adjustment of the cutting height; good accessibility for saw-blade changes and maintenance work; space saving installation.

KALTENBACH GmbH + Co. KG was founded in 1887 and has remained a family-run company to this day. With headquarters in Lörrach, Germany, KALTENBACH is one of the leading worldwide manufacturers of machinery for the processing of steel, aluminium and other non-ferrous metals. The business group includes a total of ten subsidiaries with locations in the UK, France, Netherlands, Austria, Switzerland, the Czech Republic, Singapore, the Middle East, Russia and China.

KALTENBACH has more than 500 employees and customer consultants working in over 50 countries to ensure that the companies' products, services and support are fully accessible in all regions. These are complemented by a network of



national and international service partners, providing prompt attention from experienced product specialists. KALTENBACH machinery is installed across a wide variety of industries around the globe and is renowned for its high quality, reliability and long service life. The company owes its leading market position to its commitment to these principles and to continual product innovation.

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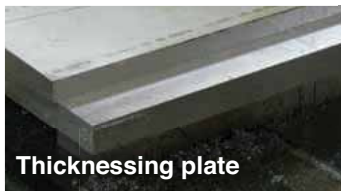


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Efficient sawing in the cutting range up to 1,060 mm

The new HBE1060A Performance

Since its foundation in 1919 in Kirchartd, Germany, Behringer has proven to be a real innovation specialist. As one of just a few complete providers in the sawing technology market, the company offers both bandsaw and circular saw machines as well as machine tools for the steel construction industry.

With the HBE Performance series, which sits alongside the HBE Dynamic series, Behringer is offering a particularly robust and powerful product line which can especially hold its own in harsh environments. Behringer is now extending this series with the largest model, the HBE1060A Performance.

With a cutting range of 1,060 mm in round stock and 1,060 x 1,060 mm for square material, the HBE1060A Performance can be used for a wide range of applications, such as those found in the steel distribution, machine building and toolmaking or in steel finishing.

The HBE series: clever and flexible

Bar steel or solid materials made of non-ferrous metals or plastics, slabs, large pipes or profiles, the HBE1060A Performance covers a wide range of

applications. Just like the smaller models in the series (HBE663A and HBE860A), it offers impressive features which significantly improve process reliability during sawing.

The HBE series is controlled via the user-friendly and easy-to-use BT65 touch control which provides maximum support to the user as they work. Once the material to be sawn has been selected from the extensive database, the auto feed control, which comes as standard, provides all the necessary technological values for the cutting speed and the servo-controlled feed. Together with the cutting pressure control, which detects the cutting force on the back of the bandsaw blade, the cutting parameters are continuously adjusted in line with the current status of the bandsaw blade, thereby providing effective protection against overload.

When it comes to sawing large diameters at slow feed speeds, the HBE1060A Performance servo feed system really excels compared to hydraulic systems. The steady feed movement provided by the ball screw spindle and servo motor provides constant chip removal and helps ensure a quiet and stable cutting process. This results in a machine with high cutting capacity and blade service life.

Impressive efficiency and low noise

Behringer uses self-produced vibration-dampening cast parts where it makes structural sense to do so. The sawing unit, supported by a torsion-resistant gantry structure, features bilateral double-wheel support. So, not only does the HBE1060A Performance impress with its extremely quiet running, precise cuts and gentle operation, in regard to the bandsaw blade, it also delivers maximum quality. The inclined position of the band wheels also helps protect the bandsaw blades as a result of reduced flexural stress. Thanks to its automatic guide arm, the bandsaw blade is always guided close to the cutting point, which is extremely convenient when it comes to handling frequently changing material cross sections.

No-compromise energy efficiency

Rising energy prices mean that companies are rethinking their existing processes and drawing on technological innovations to develop new solutions for achieving greater output with less energy input. "With the new HBE Performance series, we are demonstrating that energy efficiency and powerful hydraulics are not mutually exclusive," explains Christian Behringer.



“In doing so, and with modern, application-appropriate drives, we have been able to reduce the energy required by the machine by over 30 percent in comparison to the predecessor model.”

Reliable, proven technology

With the HBE1060A Performance, Behringer has opted for a wide chip conveyor with integrated coolant tank which is located under the funnel-shaped machine stand. Chips and coolant are thus reliably fed to the conveyor and the conveyor can be easily moved out of the machine for cleaning purposes. The ejection height of 800 mm means that large chip containers can be used.

Even the bandsaw cleaning of the HBE1060A Performance has been taken to the next level. An electrically powered brush effectively cleans away any chips that have adhered to the bandsaw blade. The quick-change device allows users to quickly change worn brushes without the need for any tools.

Functionality and design

The new full enclosure for the machine not only fulfils current CE directives, it also



meets the growing demand for user-friendliness, occupational health and safety, and environmental protection. The benefits are self-evident: a clean working environment and noise reduction combined with an optimal view into the machine. The maintenance-friendly concept enables easy bandsaw blade changeover without tools and excellent accessibility for maintenance or cleaning work.

For more information relating to Behringer and Behringer EiseleNew, other products and after sales support, contact:

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MEBA shows powerful automatic machines and networked sawing solutions at EMO

Metal bandsaw specialist MEBA offers benefit-oriented sawing solutions for trade, metal and steel construction as well as for large-scale industry. At EMO, as well as leading and award-winning double mitre technology, the company presented a range of powerful automatic straight-cutting machines, integrated into suitable overall concepts for the efficient sawing process. MEBA also focused on the important subject of digitisation.



MEBAconnect: because digitisation should benefit everyone

Under the heading MEBAconnect, the company is developing smart, sensible and feasible solutions for networked sawing for all its customer groups. At EMO, MEBA was part of the "mav industrie 4.0 area", a joint project of VDW and konradin mediengruppe. MEBA has already instigated digitisation projects, such as the intelligent MEBA control system, the highly effective MEBA Teleservice and the MEBA NC Server with all its positive effects on the sawing process as well as on the entire value-added chain.

For the first time at a trade fair and as a new development in sawing technology,



MEBA presented its projects in the Internet of Things (IoT) area. The use of IoT services in MEBA metal bandsaws has the aim of being able to detect machine states at an early stage from a distance and as a result to reduce malfunctions and downtimes to an absolute minimum. Regardless of whether it is a small business or a large industrial enterprise, malfunctions and downtimes of the production facilities cost a lot of money, something that no company can afford in the face of national and international competitive pressure. Details on the integration of IoT services in MEBA metal band saw machines were also presented at EMO.

Strong automatic straight-cutting machines for even greater efficiency

Each series of MEBA 90° automatic machines differs in size, cutting ranges and technical features specifically used to meet the requirements of the user and yet the machines are united by their pure power, quality and reliability. There were three different categories shown at EMO:

The MEBApro 260 AP automatic machine is a compact, space-saving machine that paves the way for automation and, thanks to its suitability for series production, can



process a large number of orders in the shortest possible time. Despite its simple operation, it does not lack maximum technical performance and 4.0 manoeuvrability.

The high-performance MEBAmat 330 automatic machine shows what networked



power sawing means in industry and the steel trade. It performs its tasks in continuous operation at low life cycle costs. Even solid materials made of materials that are difficult to machine are no problem. When networked, the powerhouse is THE efficient solution for rational production use.

At EMO, the MEBAmat 330 entered a new dimension of 4.0 suitability. More and more individual workflows around the sawing process are intelligently networked with the MEBAmat 330. Especially handling and transport tasks, partly also processing steps, will be automated in the future.

MEBAxtreme is available for extreme sawing tasks and cutting performance at the highest quality level. Newly equipped with MEBA thin-cutting technology, the heavy-duty straight-cutting machine achieves a drastic increase in energy and resource efficiency. Immense savings, especially in the processing of valuable materials or in the mass cutting area, are the result.

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