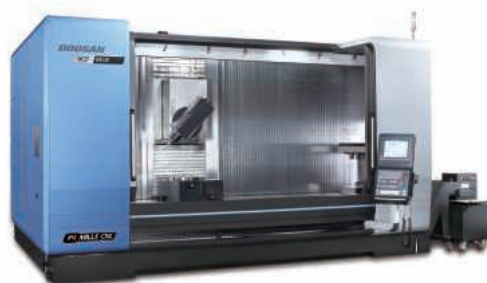


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Wind in its sales

Mills CNC, the exclusive distributor of Doosan machine tools in the UK, has reported stronger than expected first quarter sales. The figures released by the company show that the number of new machines delivered to customers and of new Doosan machine tool orders taken during the quarter were both significantly higher than those recorded for the same period in 2016.

Managing director Kevin Gilbert says: "2017 has started where 2016 left off with a marked upturn in performance. Machine deliveries and new machine tool orders for the quarter were up 78 percent and 30 percent respectively on 2016."

There are many reasons explaining the upward trend. Amongst the most salient is the resurgence in enquiries for, and subsequent sales of, large-capacity Doosan machines.

With the oil and gas sector still relatively stagnant since 2014, Mills has nevertheless seen demand for its large-capacity horizontal borers, double-column milling machines and vertical turning lathes grow exponentially, most notably from manufacturers operating in the energy (nuclear) sector, with the majority of installations being decidedly turnkey in nature.

Kevin Gilbert continues: "The increase in demand from customers for Mills-led complex turnkey and manufacturing process improvement and optimisation solutions has come from automotive and aerospace as well as nuclear component manufacturers.

"Our flexible, reliable and high-productivity Doosan machine tool technologies, combined with the unrivalled technical expertise and experience of our pre-sales, applications and service engineers, means that we are ideally placed to plan, manage and implement complex turnkey solutions."

Mills' sales have also been bolstered by a seemingly unending demand for its high-performance and versatile Lynx 220, 2100 and 300 series, its GT2100 and GT2600 universal lathes and the new DNM 4500/5700/6700 vertical machining centres, which can be supplied with either FANUC, Heidenhain or Siemens CNC controls.

The decision by Mills to offer customers the Siemens control option across its machining centre range has paid dividends and has resulted in a number of sales, most notably from new aerospace component customers.

The company is confident that the introduction of Siemens controls on its lathe and turning centre ranges, which will be rolled out during the year, will yield similar results.

New machine tool introductions have also made their mark on Mills' first quarter sales performance, with the new Doosan TW2600-GL, a high-productivity twin-spindle chucking lathe with an integrated gantry loader, being worthy of special mention.



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Compatibility makes life easier for Batchflow as it expands milling capacity

With its core business being turning, the milling capability at Batchflow Engineering had taken something of a back seat, but with the growth in low-volume production and prototype work, especially for the motorsport sector, managing director Steve Packwood recognised the need to bring machining centre capacity up to date.

Founded in 1986 by Steve's father David with just a couple of capstan lathes, Batchflow Engineering has grown into a fully evolved CNC subcontractor by investing profits back into the business. While the focus remained on turning, the company had a small milling/machining centre capability to support existing customers. As demand grew for more milling capacity, particularly second operation work, Batchflow considered using its advanced mill/turn capacity as an option. However, for smaller batch quantities and prototype work this wasn't always the most efficient use of that capacity, so thoughts moved towards dedicated machining centres.

Steve Packwood explains: "We knew we had to replace our existing, ageing, machining centre and a visit to the MACH exhibition introduced us to the XYZ 2-OP.

"As soon as I saw it, I realised that we could make full use of its capacity and the small footprint would be perfect for us at the time. The decision to buy it was one of the easiest capital investments I've ever made,

given the machine cost and the efficiency that it would bring to the business."

The XYZ 2-OP has a number of features that particularly appealed to Batchflow, firstly its size. With a footprint of just 760 by 1,220 mm it is compact enough to fit almost anywhere in any machine shop. The eight-position toolchange adds to the machine's versatility and the 3 hp, 6,000 revs/min spindle allows a variety of parts and materials to be machined efficiently, especially when combined with the machine's rigid construction. Another key element of the 2-OP is the machine table and its integral Jergens Ball Lock fixture location system.

"The Jergens system is perfect for us, as we produce relatively small batches, so setups are frequent. With the Ball Lock, we can quickly position fixtures, knowing exactly where they are on the table. This reduces setup time considerably," says Steve Packwood.

The success of the XYZ 2-OP meant that Batchflow's next investment in milling capacity also came from the Devon-based machine tool company. This time Steve opted for an XYZ LPM (Lean Production Machine), due in part to the use of the Jergens system on this machine and the ProtoTRAK control. The ability to switch jobs easily between the two XYZ machines, thanks to the Ball Lock system and the ability to transfer programs seamlessly between the two controllers, made perfect sense and once again made setups extremely short.

"The fact that the LPM machine has the same control and fixturing system as the 2-OP, made the decision more straightforward. Among the work we do for the motorsport sector there is a significant element of small batch and prototype work, but lead times are always very short, so anything that helps to reduce downtime is a major benefit. It is ideal for a typical



Batchflow's Steve Packwood describes the arrival of the XYZ 2-OP and XYZ LPM as a very positive experience



The cellular setup of the XYZ 2-OP and XYZ LPM at Batchflow bring productivity gains



The use of the Jergens Ball Lock system on the XYZ LPM and XYZ 2-OP has brought increased efficiency to Batchflow's milling operations

subcontractor like ourselves and allows us to provide a rapid response to our customers."

The XYZ LPM machine expands on the machining capability of the 2-OP with a powerful 15 hp, 8,000 revs/min BT 40 spindle and a large 900 x 500 mm table with axis travels of 785 x 470 x 530 mm (XYZ). The tool changer has capacity for 16 tools which can be accurately preset using the supplied tool preset system. The ProtoTRAK PMX control allows users to carry out background editing of programs while the machine is running, providing further opportunities to reduce setup time for the next job.

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It's all about you

Traceability with Javelin is key for motorsport specialist Brick Kiln

Specialist motorsport subcontractor Brick Kiln Composites uses the Javelin production control system from Vero Software to provide full traceability of components, ensuring compliance with strict ISO 9001:2008 requirements.

As a long-established manufacturer of carbon fibre pre-preg components for Formula 1 and motor sports teams, many of the parts it manufactures can be found with several of the front running teams, ranging from electrical trays to aerodynamic aids directing air past the vehicle.

The Oxfordshire-based company currently produces thousands of different parts a year using three autoclaves, two 5-axis Haas machining centres and a Bridgeport 3-axis machine, along with a Hexagon CMM which is used for final dimensional checking of machined bores and surfaces.

General manager Ronnie Dean says: "We take a pattern and manufacture a mould tool from it. We then mould the components and cure them in the autoclaves. Afterwards, they're machined, trimmed and assembled."

The uncured pre-preg carbon fibre is perfect for the motorsport industry's lightweight components. It is easy to handle and can be cut and laid precisely into detailed and accurate moulds, making the process ideal for the complex parts that are becoming increasingly more widespread.

Ronnie Dean says: "The ease and accuracy with which the material can be templated and cut significantly reduces waste compared to other manufacturing methods."

While they recently delivered around 600

components in eight weeks, they rarely produce batches of more than five and lead times are particularly demanding.

Ronnie Dean adds: "For example, we can schedule a component for our weekend shift because the client originally wanted it by Tuesday. Then they can come to us on Thursday and say they need it by Saturday morning."

Some of the bigger components can have an average turnaround time of around 50 hours, but Ronnie Dean stresses that's not working hours, but total time.

Javelin fulfils a number of important functions for Brick Kiln, including full traceability, a snapshot of the business and automatic error-free invoicing.

Its Javelin journey begins after a quote has been accepted, with sales order processing.

Ronnie Dean says: "Everything we make is placed on a sales order, which we also link to Crystal Reports, giving a snapshot of what the business is doing at any one time."

Works orders are raised from the sales orders and he says that, as this is a core element of Javelin, it controls the progress of work through the entire process, with a full set of monitoring and tracking routines ensuring complete visibility of work in progress.

Ronnie Dean explains: "This gives full traceability on who manufactured what, and the materials used. We've got the complete material history. Everything about every component is on the Javelin database, so we can go back and look at the date of manufacture, how it was manufactured and what material went into it. This is then stored in the archives for five years."

When deliveries are booked into the stores, batch numbers of all certified material such as their pre-preg sheets, are recorded within the GRN through materials control.

Shop floor data capture terminals



operate in five areas: clean room, inspection, trim shop, machine shop and kit cutting room.

Ronnie Dean adds: "This is extremely important to our traceability. We make a number of Class A components, so we need to know who made it and when. As soon as we need to find something, we can trace it extremely quickly with Javelin."

Another big advantage is the ease with which Javelin raises invoices and delivery notices.

Ronnie Dean continues: "Invoices are sent from the Group's head office in Wantage. They used to be typed out by hand. Now they're generated automatically in Javelin, which means they're error-free, and the operation is much faster."



"Imagine the amount of work required if we had to type manual delivery notices every time a consignment's despatched. With Javelin it's just a mouse click. It saves so much time and we know there are no mistakes. It's impossible to get an invoice or delivery note wrong and if a customer queries a delivery we can supply information showing exactly when they accepted it."

In conclusion, he says the efficiencies made by Javelin's financial functionality are just as important to his role as general manager as the SFDC is to the manufacturing side.



"I can ensure we're meeting targets and it also gives me financial control by showing what we're invoicing now compared to previous years, as well as outstanding orders with values. I have full confidence that we're delivering what we say we will, on time, and invoicing correctly for it."

Headquartered in England, Vero Software designs, develops, and supplies CAD/CAM/CAE software radically enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market.

The company's world-renowned brands include Alphacam, Cabinet Vision, Edgecam, Machining STRATEGIST, PEPS, Radan, SMIRT, SURFCAM, WorkNC and VISI, along with the production control MRP system Javelin. Despite the diversity of application, these solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations in which they are deployed.

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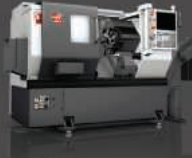
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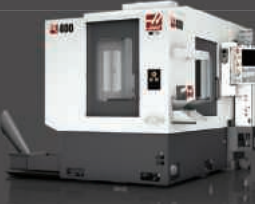
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Nova completes the engineering triangle

West Sussex-based Nova Racing Transmissions is passionate about engineering and racing in equal measure, developing aftermarket transmission systems for modern and classic motorcycles. With the technical support from WNT (UK) it has been able to improve its own performance, reducing cycle times and improving tool life across a range of materials. Now, to complete the triangle, it has become a supplier to WNT Burman Racing, whose rider Sam Burman is herself an engineer, working at Tata's Scunthorpe Steel Mills.

Nova Racing Transmissions will supply Sam Burman with its proven KTM RC250R Moto3 Dog Ring Gearbox, which was developed at the highest level with the Racing Steps Foundation and the Mahindra Moro 3 World Championship squad. At British Championship level, the same gearbox was used last season by runaway championship winner Charlie Nesbitt. Michael Payne, Nova's designer responsible for the gearbox, says: "We were contacted initially by Mark Keen of the Racing Steps Foundation as they were having issues with the OEM. Development work took place and with the Nova design we eliminated the missing gearshift issue and also improved stability when changing gear through corners."

Nova has worked closely with WNT (UK) to improve productivity of its machining activities making use of the latest solid

carbide and indexable insert tooling to extend tool life, while at the same time reducing cycle times. Among the tools it is utilising are the WTX UNI solid carbide drills, HCX1125 Dragonskin turning inserts and, W-HPC solid carbide end mills for aluminium machining. Technical support has come from direct contact with WNT's technical sales engineer Bob Thompson and discussions are underway to carry out more detailed assessment of machining processes at WNT's technical centre in Sheffield, allowing Nova's production to carry on uninterrupted while new strategies are developed.

Part of that cutting tool development

Sam Burman with her KTM Motoo3 race bike in its 2017 livery



work has gone into the machining of parts for the KTM gearbox and this brought up the opportunity for Nova to support Sam Burman in the upcoming HEL Performance British Motostar Championship.

Nova Racing Transmissions' sales manager Mick Dearlove says: "It is an interesting tie-up between Nova as the manufacturer, WNT as a cutting tool supplier and Sam who is also an engineer in her 'day job' when not racing motorbikes. We are all passionate about what we do and our values of supporting our customers match closely those of WNT and, with Sam's background, she also understands what we are doing, mutual respect all round."

The season started for Sam Burman at a test at Donington Park, with the first race meeting taking place at the same circuit between the 31st March and 2nd April.

Sam Burman concludes: "The Nova gearbox fitted to my KTM will give me much smoother and faster gearshifts, much faster than the standard gearbox. The advantage that I am really looking forward to, though, is the fact that the bike will feel much more settled and planted when changing gear on the side of the tyre. This should be most evident at circuits like Donington, which has some fast flowing sections of track where you are constantly accelerating."

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Nova Racing Transmissions' designer Michael Payne developed the KTM RC250R Moto3 Dog Ring Gearbox that is bringing great improvements for riders

At the double

Second turret plus faster feeds and speeds cut cycle times dramatically

At the Hailsham, East Sussex factory of subcontract machinist Dicker Precision Components, an Italian-built Biglia twin-turret, twin-spindle CNC turning centre supplied by Whitehouse Machine Tools has streamlined the production of a family of aluminium switch cover assemblies. The savings are so great that the cycle time for producing one part of the assembly has been halved, while the other part is produced in a little over one-third of the time.

One reason for such substantial reductions is the provision on the Biglia B465-T2Y2 lathe of a second live turret with Y-axis, whereas the machine previously employed only had one. The second turret is able to operate at either spindle and allows balanced machining operations at one side or simultaneous cutting at both spindles.

A generous maximum driven tool speed on the Italian machine of 12,000 rpm, three times higher than on its predecessor, is a further factor contributing to raised output. Not only does it increase productivity per se, but it also reduces the breakage of tools.

Lee Chapman, shop floor manager at Dicker Precision says: "Modern cutting tools benefit from elevated machining speeds, whereas they suffer if they run too slowly.

"In particular, when profiling the outside of the assembly components, our rippers and end mills used to break frequently on the previous lathe. One or two tools would have to be replaced every day.

"On the Biglia, we only needed to change two cutters during the whole of the first six weeks of operation, which started in early March. It is not only resulting in higher



The machining area of the B465-T2Y2 showing the twin spindles and twin Y-axis turret arrangement



productivity but is also leading to big savings in tooling costs."

Unlike with the former lathe, he is confident of leaving the Biglia operating unattended. So it runs overnight, seven days a week, and all parts are in tolerance the following morning. The required $\pm 25 \mu\text{m}$ on some dimensions is held with ease and once the B465-T2Y2 is set it hardly moves, so it is rarely necessary to change the offsets.

The family of switch covers comprises eight variants. Parts range in thickness from 6 to 10 mm and are all machined from 50 mm diameter aluminium stock fed from a Hydrafeed MSV65 short bar magazine. The tools required to machine all of the component varieties are resident in the two 12-station turrets, so to complete the daily changeover to the next batch run, just the program has to be called up.

Each assembly comprises a base and a cover. The former requires only a single turret to complete the machining cycle. So the halving of the time taken to complete it to two minutes is due solely to the higher spindle speeds and the consequent ability to increase feed rates without risking tool breakage.

The cover, on the other hand, does benefit from twin-turret operation in



Typical aluminium switch cover components produced by Dicker Precision on the B465-T2Y2. Bases are seen at the top and covers below

addition to the advantages of the higher speeds and feeds. Synchronous transfer of the component after parting-off to the second spindle enables simultaneous machining of the reverse face of one component and the front of the next, resulting in a cycle time of two minutes instead of the previous 5.5 minutes.

Extra time is saved by including in the CNC cycle a routine for deburring the periphery of the cover and spotting holes on the back face automatically, eliminating the former need to finish each component by hand. With several thousand switch cover assemblies produced every month, the overall advantages in terms of higher productivity and reduced manufacturing costs are considerable.

For the first few months of operation, the B465-T2Y2 was devoted to switch cover component machining. Dicker Precision was soon well ahead of production target as a result of adopting the new process, whereas bottlenecks were frequent before.

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Lee Chapman operating the Biglia B465-T2Y2 CNC lathe at Dicker Precision, Hailsham

Economical 5-axis cell for producing medical components

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

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

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

Machining operations are mainly 3-axis with the other two positioned and clamped, while some components require 4+1-axis cycles. They involve taper milling, slotting, drilling and tapping and take between 25 and 90 minutes.

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

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

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

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

approximately the same as the 450 x 600 x 330 mm capacity, fully-featured C 22 U but offers well over three times the working volume.

Steve Jackson said that any restriction in the specification of the latest three Hermle machines does not affect production.



The three-machine cell of Hermle 5-axis C 400s on the shop floor at Tecomet, Sheffield

Through-spindle coolant delivery, essential for machining stainless steel, is provided as well as tool measuring and breakage monitoring. Minimal idle times result from 6 m/s² acceleration to 35 m/min rapids in all linear axes. Trunnion swivel is 25 rpm through +91 / -139 degrees, while C-axis positioning is at 35 rpm. Control is provided by a Heidenhain iTNC 530.

Having the larger machining capacity for about the same price is useful to Tecomet. It means that more components can be fixtured at a time, leading to fewer tool changes per part and hence more efficient production.

The bigger size may also prove useful for the growing amount of alternative work the subcontractor undertakes. The Sheffield firm already forges and casts turbine blades and machines actuators and gimbals.

Furthermore, the ability of the Hermle C

400s to perform full 5-axis milling has future-proofed the investment, providing maximum flexibility for the machines to be deployed onto other work.

For over sixty years Geo Kingsbury has supplied the UK's most advanced manufacturing sectors with high quality

German machine tools. From its spacious and well equipped facilities in Gosport, Hampshire, it offers a nationwide service, providing manufacturers with innovative machining solutions and comprehensive support, now with an expanded portfolio that also includes grinding machines. The company has been privileged to work with many of the country's most prestigious OEMs in all facets of industry, including the big household names. It also has a loyal and expanding customer base of subcontractors and machine shops that rely on its knowledge and experience to give them the competitive edge they need.

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NCMT wins £7 million machine tool contract

Bromford Industries, a specialist manufacturer of aero engine and landing gear components for the global aerospace supply chain, is in the process of installing nine Okuma MU-6300V mill-turn centres in its Birmingham factory. The Japanese-built, 5-axis, vertical-spindle machines are ideally suited to volume production of nickel alloy aero engine parts to tight tolerances.

The machine tool order, placed with Okuma's UK agent NCMT is valued at £7 million. Seven of the machines have already been installed and are producing components, with the remaining two due for delivery in the fourth quarter of 2017. They form the major share of a £10 million investment at the Birmingham plant that includes tooling, automation, metrology equipment and CAD/CAM software. This investment underpins Bromford's growth trajectory as a major supplier to the world's premier aero engine programs.

Mike Tew, operations director at Bromford Industries, says: "The Okuma VMCs were selected due to their perceived quality, which has subsequently been



demonstrated in production. Our aerospace supply programmes are long-term and to fulfil them we need machine tools that maintain top levels of accuracy for extended periods, especially as they are running 24/7.

"Another factor in favour of the supplier was the successful installation a couple of years ago of an Okuma Multus B400II multifunction turn-mill centre, which has proved reliable in operation and has been well supported by NCMT."

Bromford Industries plans in 2018 to install an automated storage and retrieval system from the Finnish firm, Fastems, which has already been designed by NCMT to link seven of the MU-6300Vs to form a flexible manufacturing system. Further investment will be made in four more machines from Okuma to complement the MU-6300Vs and support increased production for flagship aerospace programs internationally.

The aerospace equipment supplier, through its use of nine Makino machining centres acquired between 2009 and 2012 for manufacturing titanium landing gear components, already had a close relationship with NCMT, which is UK sales and service agent for this Japanese machine builder as well.

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5-axis machining provides the gateway to doubling turnover at ADM Fine Machining

ADM Fine Machining is the result of two businesses, A.D.M Engineering Ltd and Fine Machining Ltd coming together and combining expertise and customer bases at the company's 12,000 sq ft facility in Littlehampton. Traceability is a key factor in all the products it manufactures for the aerospace and petrochemical industries.

Peter Howell, business development manager for ADM says: "We are ISO 9000 approved and AS9100 approval is due in Q2 2017. Furthermore, we always work in partnership with our customers to develop the most efficient manufacturing processes for their high precision components.

"Business is buoyant at the moment and our investment in the DMG MORI NMV3000 DCG was an important step in further enhancing our 5-axis machining capacity. The manufacture of complex parts in just one or two settings without the need for costly fixtures is definitely the way forward."

The NMV 3000 DCG has a 34-station pallet changer, a 12,000 rpm spindle and is capable of machining parts up to a 320 mm cube. By using vices on each of the pallets, blocks of material can be quickly and easily located ready for machining, even while the machine is running. Parts can then be inverted, where necessary, and passed through the machine again to finish the back surface.

Peter Howell adds: "We chose the DMG MORI NMV 3000 DCG because of its speed, working envelope, tool carousel capacity, rigidity, small footprint and the logic of the



Mitsubishi controller. We cut a lot of hard and exotic materials such as Inconel, Hastelloy and F51/55 and the machine cuts these with ease. For the more complex parts we produce, the DMG MORI 5-axis technology can eliminate many of the costly setup requirements of 3-axis and 4-axis machining which can significantly reduce our time to market."

The NMV3000 DCG can run for 24 hours per day, seven days a week and frequently operates unmanned. Probing on the machine and sister tooling ensure the minimum of disruption during machining cycles. Batch quantities can be very variable from just a few prototype components up to many 1,000s in series production. The pallet changer allows ADM to adapt quickly to variances in customer demands or

priorities. Programming for the machine is completed offline with the company's VISI CAD/CAM system working directly from customers' solid models, introducing techniques such as full depth trochoidal cutting with carbide tools, minimising machining times and maximising the productivity of the NMV 3000 DCG.

The aerospace parts produced by the company are mainly destined for cargo safety applications, while the petrochemical parts include metal to metal valves and motor activated needle valves, some of which operate at 2,500 PSI or at minus 200°C. As part of its service ADM builds complete and

sub-assemblies for its customers, some of which can have upwards of 350 components. Traceability is crucial for all these applications and the company has robust systems to track parts right back to the material source.

Peter Howell explains: "An important part of the traceability, as well as all the documentation and material testing, is the engraving of parts during the machining process so that there can be no mistake as to origin of the components we manufacture.

"When the two companies came together to form ADM Fine Machining Ltd it



effectively doubled turnover. We are now looking to expand into other high technology sectors such as motorsport, defence, power generation and medical where our precision engineering expertise and traceability systems will be recognised as added value to potential new customers.

"Our plan is to double turnover through diversification and, as part of that expansion, we will be investing in more DMG MORI 5-axis machines."

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Victor CNC takes-off with new 5-axis VMC range

Victor CNC has announced the arrival of the latest additions to its range of high-end machining centres: the Vcenter-AX800, the AX800II and the AX800 Aero 320.

Developed for the 5-axis machining of large parts in the range of 1 m diameter, the new Vcenter AX800 is a precision powerhouse that now has an AX800II and Aero 320 variant that have been added for the ever diversifying demands of end users.

The new Vcenter AX800 has been configured with a swivelling head B-axis and a rotating C-axis table that is clamped at a high torque of 3433 Nm for heavy duty machining. As can be expected from Victor CNC, the AX800 has been built with rigidity and performance at the core of its design. This is evident in the B-axis that has a Hirth coupling that will rotate at increments of 1 degree with exceptional precision and repeatability.

With its 4+1 machining configuration, the AX800 has a rotary table built into the fixed table for enhanced flexibility while the roller CAM driven mechanism for both rotary axes delivers unparalleled rigidity and stiffness. Ideal for heavy cutting operations, this CAM mechanism gives the Vcenter AX800 high rotation speeds of 25 rpm on the C-axis. Furthermore, the CAM mechanism shortens cycle times considerably when compared to conventional worm gear mechanisms found in many machine tools.

All this is mounted upon heavy-duty Meehanite castings that are used for the bed and column to ensure maximum vibration damping and strength characteristics. The column is extremely rigid and tough with a heavily ribbed design that enables high Z-axis acceleration rates for high speed movement.

The rotary table has a diameter of 800 mm with a loading capacity 1,200 kg, which makes it suitable for loading large or heavy parts. With a work envelope of 1,600 mm by 700 mm by 600 mm in the X, Y and Z axes, the spacious machining centre is remarkably capable, flexible and spacious for sizeable parts often machined in the aerospace, automotive, energy and mould and die sectors. However, customers looking for

even more capacity can specify the new AX800II. With this variant, Victor has moved the C-axis rotary table forward by 100 mm. This alteration gives the AX800II capacity to machine components up to 1,200 mm as opposed to 1 m on the AX800. Given the AX800II a maximum machining capacity of 1,200mm diameter with a height of 300 mm, this upgraded model gives customers even greater machining flexibility and capacity, all within the same compact footprint.

31i-B5 CNC control unit, the AX800 Aero 320 manages the twin rotary tables and tilting head with seamless simplicity and synchronicity. This new addition to the AX800 range incorporates a HSK-A63 spindle configuration with a table diameter of 320 mm plus an adjustable span between the tables.

With regards to optional extras, the new Vcenter AX800 range can be supplied with Heidenhain TNC-640 as an alternative to the



Evolving the machine a step further for particularly complex components and especially thin walled parts that are manufactured in the aerospace industry, Victor has also introduced the new AX800 Aero 320. With the new AX800 Aero 320, the bar has been raised in machine tool technology. Victor CNC has removed the C-axis that is on the standard AX800 and AX800II models and replaced it with twin-rotary tables (A-axis). Incorporating synchronous control technology, this new variant makes it possible to precision machine extremely delicate and thin walled parts such as aerospace engine and turbine components as well as structural aerospace parts.

Utilising full 5-axis control via the FANUC

standard Fanuc Control, through spindle coolant from 20 to 70 bar, a variety of swarf conveyor systems, hydraulic or pneumatic ports on the rotary table, linear scales and angular encoders, automatic tool length measurement, automatic part measuring, along with additional options that can be specified which include oil hole coolant supply, table shower system, spindle configuration and automatic doors.

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Offshore investment

It's no secret that the oil and gas sector has undergone a difficult period in recent years brought on by falling oil prices, with many suppliers looking to diversify into alternative sectors. However, one company is making a virtue out of staying true to its roots in the offshore industry and is continuing to invest for success.

Being over 300 miles from Aberdeen, High Wycombe is not an area closely associated with the oil and gas market. However, it is home to MSCM Ltd, a leading manufacturer of subsea products. MSCM designs, manufactures, assembles and tests a range of subsea hydraulic distribution equipment that is supplied to its clients in the offshore industry throughout the world.

Set up in 1999, the company specialises in everything from hydraulic couplings, through to ROV stabplates and has extensive capabilities in design, milling, drilling, turning, welding, assembly and testing.

MSCM now manufactures around 98 percent of the products it provides to its oil and gas customers. However, it hasn't always been this way.

"Ten years ago, we were doing about 50-60 percent in-house and the rest was being subcontracted out. We ended up waiting around for parts to come in, which created delays and made delivering orders with short lead times, increasingly difficult for us," says Neil Robinson, MSCM's managing director.

Dissatisfied with the delays, the team at MSCM decided to invest in more advanced technology and improve its in-house manufacturing capabilities. Neil Robinson continues: "We knew we had to stay competitive and to do this we had to become more flexible and reactive to our clients' demands, by cutting lead times.



Operations manager Martin McLintock with MSCM latest Mazak machine, the HCN 6000

"We were getting a big message from customers that if we could get the right product to them at the right time, which is a real challenge for the industry, then they were willing to commit to us."

MSCM turned to Yamazaki Mazak and the machine tool manufacturer has been integral to the upgrading of MSCM's machining capabilities ever since.

Having dealt with Mazak machinery in the past, Martin McLintock, MSCM's operations manager, was already familiar with the impact the machines could bring:

"We were making big business decisions and we wanted to be sure that any investment in new machinery would have an impact. Our greatest concern was whether we had the capabilities in-house to support such a huge technological step-up.

"We went with Mazak, not only because they have such a wide variety of technology and can provide everything we need but also because they are a UK supplier and work with us as a partner."

MSCM made its first of the more recent investments in 2012 following its relocation to the current larger facility and the company now has fourteen Mazak machines in operation on the shop floor.

"We started off small, with a simple QUICK TURN NEXUS 250 MSY turning centre," says Martin McLintock. "We quickly saw the advantages and efficiencies it could bring, with much reduced cycle times."

One of the key products in MSCM's portfolio is hydraulic couplings.

"They were previously taking two or three machines and multiple operations to produce," explains Martin McLintock.

"What we really wanted to do, and what we needed to do, was to increase our throughput and flexibility. We turned to Mazak again, and invested in our first INTERGREX j-300 in 2015.

"We initially had our concerns about moving into 5-axis machining, however we believed that we had the right calibre of people and that, providing Mazak would support us where necessary, we would successfully make the transition. Mazak throughout our early days supported us very well, which we expected due to our strong working relationship."

He says that the machine shop is now getting couplings off in one cycle, taking out multiple operations and setting up the job far quicker, enabling MSCM to be far more reactive, flexible and competitive.

"In today's market we have to be competitive in all aspects of price, quality and delivery," says Neil Jeffrey, MSCM's head of sales. "The message from clients is

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The MSCM machine shop in High Wycombe which now includes Mazak machines

that they really respect that we are putting in the investment and continuously improving our service to them."

It is this drive for efficiency that has motivated the company to continue to make further investments in its machinery, with a horizontal machining centre, the HCN-6000, joining the shop floor in November 2016.

"It's been a great success so far. We've had five different components through already," says Martin McLintock.

One of the stand-out benefits of the HCN-6000 is the SmoothG control panel. As the world's fastest CNC, it offers a 38 percent improvement in cycle times, whilst

delivering greater cutting accuracy, both of which made a significant improvement at MSCM.

"At first, the SMOOTH control was a learning curve for our guys, but now they've got to grips with it, they love it. New machinery takes time to get used to, but we've been really impressed with Mazak's after service and customer care. Thanks to their training and support, our guys managed to get these machines up and operating efficiently within just a few weeks of having them installed," continues Martin McLintock.

Going forward, MSCM has plans to take the business a step further.

"The focus for us now is to look at the rest of the machines we have and eventually refurbish the whole shop floor," says Neil Robinson. "You've got to keep moving, you can't stand still. We've seen what investment can do for our business and how important it is to stay competitive in the oil and gas industry. I'd say we are bucking the trend and proving that oil and gas can still be a profitable sector to be in."



Rows of Hydraulic Flying Lead stabplate assemblies, manufactured at MSCM's High Wycombe manufacturing facility, awaiting dispatch to MSCM's Buckingham facility for termination to the steel tube flying lead assemblies, final pressure test and flushing, prior to being shipped to a major subsea project in Australia

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Mitsui Seiki introduces VERTEX 55X III 5-axis VMC

The latest addition to the Mitsui Seiki Vertex 5-axis simultaneous control series of vertical machining centres introduces a multi-sensor thermal growth monitoring system MAMS (Mitsui Accurate Milling Support) that enables enhancements in accuracy by creating up to a 35 percent improvement in minimising Z-axis thermal displacement against previously used machine tool technologies.

Able to produce 5-axis cycles on workpieces within an envelope of 750 mm diameter by 525 mm high, the Mitsui Seiki Vertex 55X III, now available through 2D CNC Machinery of Hinckley, incorporates rapid traverse rates of 48 m/min to positioning accuracies of +/- 1 micron over the 550 mm in X by 600 mm in Y- and 500 mm in Z- axis travels. Meanwhile, small point-to-point surface movements are also realised due to the advantage gained by greater rigidity of the machine design.

Workpieces are held upon a 360 degree, 50 revs/min C-axis table of 400 mm diameter that is able to support loads of



Mitsui Seiki Vertex 55X III from 2D CNC Machinery introduces MAMS multi-sensor thermal growth monitoring to 5-axis machining

350 kg. The A-axis is +15 to -105 degrees, whilst being able to work to a positioning accuracy of +/- 2 mins and with a repeatability of +/- 1.5 mins.

Weighing in at 9.5 tonnes, rigidity in the bed and castings is paramount in maintaining consistent three-dimensional

component accuracy. The 40 taper spindle power is 18.5 kW, giving 25,000 revs/min with 28.6 Nm of torque available. Tool storage capacity is 40 positions for tools up to 90 mm diameter (125 mm with adjacent pockets left empty) by 300 mm in length.

Established in 2009, 2D CNC Machinery Ltd was set up to be a sole distributor for premium brand CNC machines in the UK. Covering the full spectrum of manufacturing needs, the product range consists of horizontal and vertical machining centres, including 5-axis, grinding machines and automation solutions at the highest technical level.

Due to the steady growth of business, it expanded its portfolio of brands and grew its workforce. April 2016 saw the merger of the company with Halbronn, France.

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Citizen's LFV technology is a winner for swarf control

Plastic Turned Parts (PTP) was the first company in the UK to install a Citizen CNC sliding head turn-mill centre incorporating the patented Low Frequency Vibration (LFV) machining technology and as a result has been able to totally eliminate swarf of plastics components.

Managing director Jonathan Newis says: "For us, the development of LFV has transformed our turn-milling operations so we can now confidently progress the business and operate the Citizen bar machine from pressing the start button rather than having to continually interrupt the cycle to clear troublesome birds nesting of plastics swarf."

He describes LFV as being especially effective on deep hole drilling and says: "We have totally eliminated any clogging of the drill flutes. Previously we often had to set the machine with two or even three drills due to swarfing problems but can now go straight to depth with a single tool and the flutes are completely clean."

PTP installed the Citizen L20-VIII LFV machine in January following a visit to MACH 2016 and promptly placed the order after seeing a demonstration of the technology on the Citizen stand.

Jonathan Newis continues: "So impressive is the result of applying LFV that our forward plans are to purchase a second machine with a smaller 16 mm capacity once it is available, so we can more effectively machine smaller components."

PTP is based in Watton-at-Stone just outside Hertford and employs five people, all very proficient and skilled in machining plastics. The company was set up in 2004 and much of its production has enabled a continued growth (20 percent in the last two years) based on largely Citizen supplied



Machine setter Darren Evans maintains the wiper action created using the tool with Citizen's LFV technology producing a superior surface finish

machines. These comprise eight CNC sliding heads with capacities up to 32 mm diameter and a fixed-head Miyano BNA-42S turn-mill centre installed in 2013. Also in the machine shop are fixed head lathes with a bar capacity up to 65 mm diameter and billet capacity of 250 mm. A vertical CNC mill provides addition milling capability.

A wide range of components are produced for customers in the marine, paint spraying, bearing, food, motorsport, telecommunications, automotive, valve and medical sectors. A major long term medical contract won by PTP is the production of 6,000 ear grommets a month for babies that suffer from glue ear. These are micro-machined from 5 mm PTFE bar on a Citizen K16 and turned down to just over 1 mm diameter with a 0.75 mm diameter hole drilled through.

In addition to PTFE, the plastics-based materials passing through the machine shop are wide ranging, including Acetal, Delrin, Nylon, PVC, polypropylene, polyethylene, Nylatron, PEEK, graphite-filled PTFE, as well as other high performance plastics including variants of glass reinforced plastics in batches between 500 and 10,000.

Jonathan Newis adds: "As we provide a specialist service and have developed the skills we have to be able to respond to the demanding nature of some of these materials. Polypropylene, for instance, can

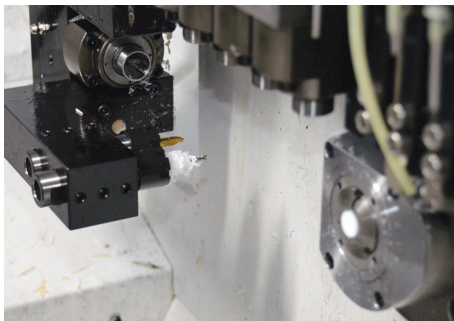
react totally differently under cutting conditions and will even behave almost like machining chewing gum. Others can soften, melt and many just grow, deform or spring back."

Reflecting on machining polyethylene, he describes this material as being a nightmare with swarf wrapping around the tools and often melting on drills: "With LFV it readily chips so we can now even run unattended with the process carrying on for several of hours. This has further benefits as it frees up setter/operators during the day to do other things which is a massive advantage for a small company."

On the other hand, he describes how reinforced materials kill any tooling, so when these materials go through any machine the process has to be continuously monitored: "Not so with LFV, hence our pre-occupation with the capability of the new Citizen, which is transforming our business and really helping us to help our customers."

The patented LFV process is totally different to conventional ultrasonic vibration machining and took some three years for Citizen to develop in Japan. It is now demonstrating significant improvements, not only on cutting plastics as PTP has found, but also on exotic materials, difficult to chip ferrous and non-ferrous materials such as copper.

The LFV process can also enable



With Citizen's LFV switched-off, 'birds-nesting' of swarf is a big problem when drilling plastics

depth-of-cut to be increased, enabling surface quality to be enhanced, extending both tool life and spindle uptime and hence can transforming machine utilisation. It can even be applied to very small diameters as well as thin-walled components and be used for turning, facing, eccentric and interrupted cuts, drilling and even thread cutting.

The process is fully programmable, activated through a G-code enabling on-demand application anywhere in the cutting cycle. The servo axes of the machine drive system are 'oscillated' in the direction of tool feed in phases, involving tens of microns which are synchronised with rotation of the spindle. Toolpath includes 'air-cutting' which interrupts the cut that breaks the swarf into smaller lengths or pieces. It also importantly reduces the onset of built-up edge on the tool tip, which is a bad influence on the geometry of the tool and is often a cause of premature failure.

Darren Evans is responsible for setting the Citizen with LFV at PTP: "We are able to maintain a wiper action as the tool recuts the material, which helps to create a superior surface finish. We can even program the LFV to tailor the ideal length of swarf



Plastics 'birds-nesting' in the right hand without LFV on the Citizen L20-VIII and the cutting process totally under control with programmed chip lengths using LFV in the left hand

through P1 and P2 codes that set the frequency of oscillation. To us this is a very important benefit, as ultra-small chips of plastic would just build up and clog the machine."

PTP tends to run the machine spindle at 4,000 revs/min, with feed rates of 0.03 mm/rev (P1) or 0.05 mm/rev (P2). P1 is used for general swarf breaking and P2 for

small diameter turning and drilling. Jonathan Newis says: "We use both carbide and HSS tools and a further bonus of using LFV is that we have reduced our need of form tools as everything is now generated quickly and easily from standard single point tooling."

With plans for further LFV machine installations, he is now able to move the business forward with even greater confidence: "A major problem with plastics is variation in the material, which can become a major headache on certain jobs. We now have the ability to easily influence the application to meet our needs."

With this new found capability, he is about to take on a further contract with a supplier to the automotive sector and sees the extension of the fracking industry in UK, where high temperature plastics are used, providing an excellent opportunity for the future.

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Prepared for all eventualities

Leading precision subcontractor invests in state-of-the-art Doosan 5-axis machining centre from Mills CNC

UK Manufacturing is facing uncertain and challenging times. The recent triggering of Article 50 formalising the two year process for the UK to leave the European Union has led some economic experts to predict a slowdown in growth and a general contraction within the sector. Others, no doubt fuelled by the fall in value of Sterling and its positive impact to date on exports, are more bullish and are confident that UK Manufacturing is more resilient than was originally thought.

With so many competing and often conflicting views of what 'could happen' in the future, many UK companies, rather than waiting and 'hoping for the best', are taking matters into their own hands, investing in their manufacturing plant, equipment, processes, systems and people, and strengthening their supply chain relationships to make themselves better prepared for the future and better positioned to capitalise on opportunities in the post-Brexit world.

One such company is leading precision subcontract specialist Aerotech Precision Manufacturing, based in Poole, that in October 2016 invested in a state-of-the-art, high-performance Doosan VCF 850LSR 5-axis machining centre supplied by Mills CNC.

Aerotech, established in 1990, manufactures and supplies high-precision complex components and assemblies for the aerospace, defence, medical devices, nuclear and oil and gas sectors, as well as parts for 'special purpose' processing industry and packaging equipment and machines.

Components machined by Aerotech vary considerably and include prototypes and one-offs through to small-medium batch production.

A significant proportion of Aerotech's work is in these highly-regulated markets and the company, not surprisingly, has invested heavily in ensuring that it has the correct accreditations and certifications to operate and grow within these sectors, i.e.: AS 9100 (Rev C); ISO 9001; ISO 14001 and Fit4Nuclear.

The company prides itself on the quality of its parts it supplies and adopts a 'right first time, every time approach'. It also



Aerotech Precision Manufacturing's Allan Redfern, director (left), with Aaron Houston, business development manager (right) by the company's new Doosan VCF 850LSR

invests significant resources into both achieving and often exceeding customers' tight delivery deadlines and in controlling costs.

The emphasis on quality, lead time fulfilment and cost competitiveness explains, to a large extent, the company's recent investment in the Doosan VCF 850LSR machine.

Aerotech business development manager, Aaron Houston says: "We operate in highly-competitive global markets and, as such, you simply cannot afford to 'stand still'.

"As a consequence, we regularly audit and review our engineering and technical capacity and capabilities, benchmarking where we are against where we need to be. If there's a disconnect between the two, we make strategic investments in the latest technology to bridge the gap."

As part of the company's continuous improvement programme, Aerotech made the decision to replace one of its existing large-capacity 3-axis machines with a new, high-specification 5-axis machining centre. The investment was intended to help the company reduce job setup times and part cycle times by adopting a one-hit machining strategy and, in doing so, improve its productivity and process reliability.

Aerotech Director, Allan Redfern adds: "Although we decided on the 5-axis

machine tool route, there are so many different types and models available that we made sure we gave ourselves sufficient time to investigate the market thoroughly to ensure we selected the right machine for our requirements."

To a large extent, the sectors served, the materials used and the type and complexity of components machined by Aerotech narrowed the choice down to a large-capacity, ultra-versatile 5-axis machine equipped with a Heidenhain control and high-efficiency swarf evacuation/chip management system.

The machine also needed to deliver excellent cutting performance, i.e. maintain high volumetric accuracies in roughing operations and to guarantee high surface finishes, enabling the company to produce parts using 3-axis, 4 + 1 and full 5-axis simultaneous machining.

Allan Redfern continues: "We had previously invested in a Doosan Puma 480L lathe from Mills CNC in 2013 and have been impressed with its reliability and performance as well as Mills' after-sales service and support.

"As part of our 5-axis machine tool selection process, we attended Mills' Groundbreaking Technology' Open House in Autumn 2015 and visited the company's stand at MACH 2016.

On both occasions we were able to see

the VCF 850LSR machine in action and to talk to Mills sales and engineering staff about the machine and our plans."

The large-capacity moving-column-type VCF 850LSR machine has X-, Y- and Z-axis travels of 3,000 mm x 850 mm x 800 mm, a B-axis (+/- 110 degrees) built-in, 'swivelling head' milling spindle (32 kW/12,000 rpm) and a 800 mm diameter built-in rotary table integrated into the machine's 3,500 mm x 870 mm long bed.

The machine also features roller LM linear guideways, a 60 position servo-driven chain-type ATC, the BIG PLUS face and taper tool shank configuration and onboard cooling systems (spindle, ball-screws, housings etc.), that help minimise thermal displacement during long production runs.

Allen Redfern adds: "The VCF 850LSR represents a sound investment and is being used to machine complex, high-precision components for aerospace, defence and nuclear sector customers.

"One of the components being machined on the Doosan is used in advanced, remotely operated underwater vehicles (ROVs), which themselves are used in the detection, assessment and destruction of sea mines.

"The components are made from aerospace grade aluminium alloy and are machined from solid, first on our lathes (first operation), and then 4-/5-axis machined on the VCF 850LSR.

"The components are rough machined in the first instance, which requires significant high accuracy stock removal and, subsequently, are finish machined to realise a Ra 0.4µm surface finish.

"Since machining these parts on the new Doosan machine, cycle times have been reduced dramatically."

Now, some six months after installation, the VCF 850LSR is, naturally enough, is taking on more and more work as Aerotech directors and managers become more familiar with the machine, its capabilities and its potential. The machine has also become a focal point for customers and prospects visiting Aerotech's 2,500 square metre facility.

Aaron Houston concludes: "When visitors see the VCF 850LSR up close and in action they are impressed. The machine provides them with confidence and the certainty that



High-precision components machined on Aerotech's new Doosan VCF 850LSR 5-axis machining centre

Aerotech can achieve the part quality and lead times they demand.

"With advanced machining technologies on our side like the VCF 850LSR, we are prepared for most, if not all, eventualities in these challenging times."

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GB Precision rises to sub-millimetre titanium challenges

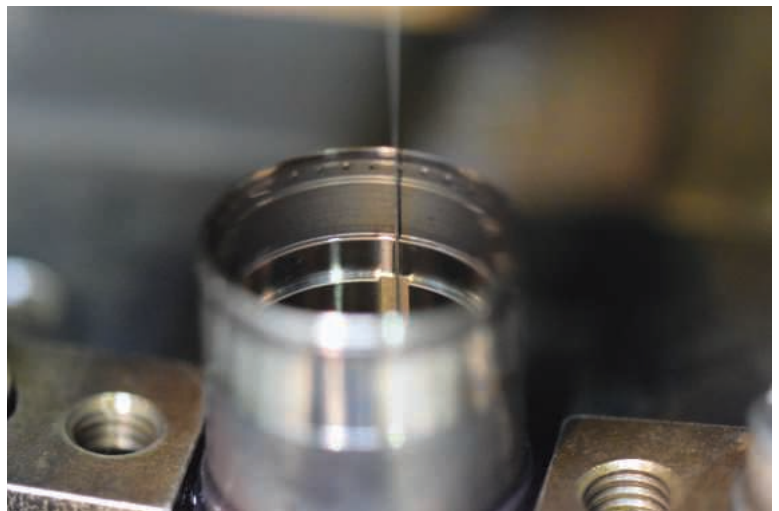
Machining components for the aerospace sector poses some of the most demanding engineering challenges tackled by companies today, not only in terms of the high accuracy and tight tolerances that must be achieved but also due to the specification of increasingly exotic and difficult-to-work materials.

Birmingham-based specialist subcontractor GB Precision has positioned itself to take on exactly this type of work, through investment in the most advanced CNC equipment and many years dedicated to solving the most intricate engineering problems.

One recent challenging aerospace task was for a mere two components, which together would have fitted inside a 100 mm cube.

Machined in titanium, the first component incorporated two slots and the second component incorporated three slots – so far so good. One of GB Precision's EDM machines could certainly accomplish that, even though these components were only 30 mm diameter and 10 mm thick, with the finished slots specified to be 0.6 mm wide. That meant that the EDM start holes had to be 0.5 mm diameter, which called the capabilities of the company's Mori Seiki NL 1500 CNC lathe into play.

Director, Paul Turner explains: "In this instance, it was the combination of technologies available on our shopfloor that made the difference, turning an impossible task into one that was just pretty challenging. One of the key benefits I believe we provide to



An example of an aerospace component machined by GB Precision

our customers is our ability to develop creative solutions by bringing different technologies to bear on a single task."

GB Precision

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FANUC provides the model machine for prototype company

Established over 60 years ago, the reputation of Ogle Models & Prototypes can be confirmed by its customer list down the decades. Manufacturing special projects for Bentley, Virgin Atlantic, GSK, JLR and Lamborghini to name a few, some of the company's early work includes the Y-fighter and Luke Skywalkers' land cruiser from the original Star Wars film in 1976.

The company wins such prestigious projects through its skill set that includes expert model making and hand crafting, mixed with modern technology such as industrial 3D printing, vacuum casting and CNC machining. To keep abreast of technology, the Letchworth-based company recently purchased a FANUC ROBODRILL D21LiA5.

Delivered just over a year ago, the ROBODRILL has been an exceptional addition for the Hertfordshire business. Managing director of Ogle Models & Prototypes, Len Martin says: "We bought the ROBODRILL because we are always on a quest to make things faster and with better quality, and what we currently have is a lot of other ordinary 3-axis CNC machines. These are basic machines and we wanted to move our business on and produce much higher quality parts at greater speed. It's a drive for everyone to be more competitive and make parts quicker."

Ogle only manufactures prototypes and small quantities. Len Martin says: "We don't do production runs, it's all one-off and small quantity work. Therefore, you could say



production time is less relevant and it's all down to programming. The new machine runs faster and produces a better finish than some of our existing machines, but even if we did have a small batch of 20-off, the FANUC is at least twice as fast as our other machines. Added to this, the quality and accuracy is also a huge factor."

Primarily, the company uses model board on all its CNC machine tools. However, the FANUC ROBODRILL has been tasked with machining everything from model board through to plastic, aluminium and steel.

Demonstrating the productivity credentials of the FANUC D21LiA5, Len Martin continues: "We undertook a project to make aluminium paddles for a car with plastic interior paddles, as the customer preferred the feel and look of a polished aluminium finish. We started by machining the job from solid aluminium billets on one of our older machines, but halfway through the job we took delivery of the new ROBODRILL. We then transferred the job to the

FANUC ROBODRILL, and by doing this, the FANUC produced the paddles twice as fast with a far superior surface finish."

When selecting the ROBODRILL, Ogle wanted the largest version of the machine available with a 4th axis configuration. "We wanted the largest possible work area as we knew we would lose some natural space with the 4th axis," explains Len Martin. "We wanted all the hallmarks of an extremely fast machine with as big a bed as possible. The machine certainly hasn't disappointed. It's been a really impressive addition for us."

Ian Taylor, a model engineer at Ogle says: "When I joined the company, it was a machine that I really wanted to work with and I recommended it purely because of the large work envelope and small footprint. On top of this, the ROBODRILL is very easy to use. As a company that conducts most of its programming off-line, the CNC control is extremely easy to use when it comes to operating the machine. I've used a number of control units down the years and the FANUC control is by far the most user-friendly. We have to set up the job and the tool offsets and this is very straightforward to do, as the controller takes you through the process, making everything quite clear and easy."

The BT30 ROBODRILL has a BBT spindle



nose interface that provides exceptional speed, power and rigidity with its face and taper configuration.

"We need this combination of attributes, as one day we could be machining a very soft material like model board or plastic and the next day it could be aluminium, brass or even steel. I need a very big variety of options and the ROBODRILL gives us this, especially with the speed control feature that gives me complete control when it comes to operations, such as drilling or tapping, for instance."

"Very often, we do very long programs and run our machines unmanned overnight. It's quite frequent that I will have a 16 hour machining job that will be set at the end of the shift to run unmanned overnight. With the 850 by 410 mm table, I also have the facility to set up multiple parts, as a lot of the work we do is quite small. This means we can have a batch of parts produced overnight."

The 21 tool position machine has a maximum spindle speed of 24,000 rpm and Ogle utilises this speed capability frequently. Len Taylor continues: "We regularly use 0.25 or 0.5 mm diameter cutting tools and a lot of our more detailed work requires tools with a 0.1 mm diameter.

We run these small tools for fine detail features, such as graphics or engraving parts. With regards to machining at these high speeds, we have to run the tools at equally high feed rates. We have to remember that even though the tool is cutting it is also rubbing against the part at the same time, so if I run the tool too slow it will get too hot. To this end, we run at very high feeds to get the swarf out of the flutes and away from the part as quickly and efficiently as possible."

Demonstrating these high speeds and feeds, Ogle recently manufactured a series of parts from polyurethane model board at 20,000 rpm with a feed of 8 m/min.

"This is as fast as we can run the machine on detailed parts, as they have curved edges and intricate features and this means the machine has to decelerate and accelerate,"



says Len Martin. "In essence, the FANUC ROBODRILL gives me everything I need from a machine: it's extremely fast, reliable, powerful and precise. Furthermore, it has a large bed with a 4th axis capability, which means that we can machine an extremely wide variety of parts on the FANUC at high speeds."

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Mill-turn control enables short lead-times

The world's longest and deepest rail tunnel, the Gotthard Base Tunnel, opened in June 2016. The 57 km (35 mile), twin-bore, high-speed link under the Swiss Alps between Northern and Southern Europe aims to replace one million lorry journeys by road per year. The four tunnel boring machines that were used to excavate the pair of 8.83 m diameter bores through over 85 km of rock were built by Herrenknecht AG in Schwanau, Southern Germany.

To produce its machine components out of wear-resistant steels, the manufacturer invested in an RTT 30 bed-type milling machine with B-axis swivelling milling head and integrated rotary table from MTE, Spain. The mill is fitted with a HEIDENHAIN TNC 640 CNC system, which is capable of controlling both prismatic and turning operations.

With this machine/control combination, the company succeeds in simultaneously milling and turning in one setup and in short lead-times components up to 2,100 mm in diameter, 1,500 mm long and weighing up to 15 tonnes. Operation is said to be easy

for the operators, which is important for Herrenknecht as detailed machining operations are programmed by the operators at the TNC control, such as cycles with grooves, recesses, hole patterns and inclined holes. Only the basic program comes from the CAM system.

Every year, the Herrenknecht components factory, with a workforce of over 450, delivers standard components for assembly worth 60 million euros, including drill heads, cutting tools, transmission housings, rings and more. Parts are machined from wear-resistant steels such as Hardox 500 or fine-grained steel like S690. In addition, spares have to be produced immediately if there is a drilling machine failure on a construction site.

The interaction between the bed-type machine and the TNC 640 mill/turn control makes it possible to perform complex machining tasks in just a few setups, with 3D



simulation of the process beforehand. For example, on one occasion a billet 800 mm long, 960 mm in diameter and weighing four tonnes was milled and turned to produce pockets, cross holes, angled face milled features, knurled areas and more, during which nearly 80 percent of the material was removed to leave just 850 kg.

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A milestone for FANUC

New headquarters unifies FANUC UK and provides the platform for growth

Leading global manufacturer of automation and industrial robotic solutions, FANUC UK has officially opened its state-of-the-art headquarters at Ansty Park, Coventry. The result of an investment of more than £19 million, the new 107,000 sq ft facility highlights the significant growth the company has experienced over recent years, as well as its unified approach for the future. FANUC's new headquarters is four times larger than its previous location and will enable the business to further develop its offering and strengthen its position in the market.

Crucially, all aspects of the business will operate under one roof, while the three-storey building is also home to a design, manufacturing and training facility, offices and showroom area. FANUC UK currently employs more than 100 people and anticipates further growth of its workforce in the coming months. The business specialises in factory automation, which is split across three categories: robotics, machine tools and factory automation systems. Its extensive product portfolio comprises market-leading vertical milling centres (ROBODRILL), plastic injection moulding machines (ROBOSHOT), wire EDMs (ROBOCUT), industrial robots and CNC systems.

Overall the project has taken approximately 12 months to complete. Recognised as one of the most successful business technology parks in the UK, Ansty Park is strategically located at the hub of the UK motorway network and is considered the new home for technology and innovation.

The new facility was officially opened on 16th May, attended by around 300



representatives from FANUC, Japan and Europe, as well as local dignitaries and the press.

Dr Yoshiharu Inaba, chairman and CEO of FANUC Corporation, said: "Since we started our FA business in 1956, FANUC has been focusing our activities on automation and robotisation in manufacturing sites. Over these years, we have been expanding our global service network by establishing service locations and today this number has reached 257 sites in 45 countries. We are constantly striving to deliver top class services to support our customers all over the world.

"Since establishing FANUC UK in 1980, FANUC has been contributing to the development of manufacturing in the UK. Today, a total of 3,000 CNCs, 9,000 robots and 700 Robo machines have been installed.

"This new UK facility is four times larger than before, with substantial enhancement in the size of training rooms, robot system rooms and spare parts warehouse. This will enable FANUC to further strengthen our support and services to all our customers, while promoting the advancement of industries in this area.

"Needless to say, FANUC is continuously reinforcing our FA robot offering and at the same time accommodating developments in IOT and embracing Industry 4.0. We are accelerating the production of AI technologies, by utilising the newest technologies in each of our products.

"With this new FANUC UK facility, we will ensure delivery of these state-of-the-art technologies to all our customers."

Tom Bouchier, managing director at FANUC UK comments: "Our new headquarters represents a new approach for FANUC UK, with all parts of our business brought together under one roof for the first time in the UK. By consolidating these functions, we can enhance our capabilities and provide customers with a combination of solutions to meet their every need.

"This investment has helped grow our capacity and more crucially has enabled us to strengthen our training services. Training is essential for our customers and our new training area is equipped with state-of-the-art robots, enabling users to fully exploit the capabilities of robotic technology. Our relocation will drive further growth, develop our team and strengthen our services, solidifying FANUC's position in the UK as a market-leading manufacturer and solutions provider."

The new facility also provides FANUC UK with the opportunity to increase capacity in the future with 25 percent expansion capability.

FANUC launches purpose-built academy

FANUC is also launching a purpose-built training academy in Ansty Park, Coventry.

The academy, which is more than four times the size of FANUC's previous facility at the Seven Stars Industrial Estate, includes more than £300,000-worth of brand new equipment, allowing students to receive practical training in a safe, controlled environment.

The academy features eight cells of new FANUC M-20 and M-10 robots, as well as a



ROBOCUT (wire electro-discharge cutting), ROBODRILL (highspeed milling) and a ROBOSHOT (injection moulding). The academy also includes two established robot models, which can be stripped down and rebuilt for maintenance training.

Each machine is equipped with the latest touchscreen teach pendant and human-machine interface (HMI) technology. The machines are smaller versions of the FANUC models on sale and operate at a teach speed, allowing students to work on them at their own pace.

The basic introductory course, which lasts for around five days, allows students to learn the fundamentals of machine operation, from basic safety protocol to programming and control. The academy also offers advanced and maintenance courses, as well as bespoke programmes. Applications are accepted from both experienced and first-time users of automated machinery.

The FANUC academy is one of several similar facilities at various locations around the world, helping customers to increase their productivity and minimise downtime by giving them the knowledge they need to work and maintain their machines without requiring the assistance of a FANUC engineer.

Anthony Bentham, customer service manager at FANUC UK, says: "The FANUC training academy helps customers and staff to make the most of the machines they work with, be they a robot, a plastic injection moulding machine or an electric wire cutter.

"With robots and automation becoming key tools for global manufacturing, it's vital that the UK workforce is ready to meet the challenges and opportunities that this technological innovation represents. As a global leader in factory automation solutions, FANUC is the perfect learning



partner for anyone looking to develop their skills and knowledge, from established factory workers, to the next generation of engineers."

To find out more about the FANUC academy, or to book your place, call 024 76 053001 or email academy@fanuc.co.uk. Alternatively, visit www.fanuc.eu/uk/en/lifetime-management/academy

FANUC is a leading global manufacturer of factory automation solutions using Computer Numerical Control (CNC) systems. From its international headquarters at the base of Mount Fuji in Japan, FANUC specialises in the development and manufacture of factory robots and automation machinery, including wire EDM machinery (ROBOCUT), high-speed milling machinery (ROBODRILL) and injection moulding machinery (ROBOSHOT). More than 400,000 FANUC robots are currently operating worldwide.

FANUC develops and manufactures all of its components in-house and provides lifetime parts, repairs and support to its customers.

Based on more than 60 years of research, FANUC's CNC systems allow manufacturers to maximise their productivity, while minimising downtime. All FANUC systems offer high reliability, strength, control and precision. They are also equipped with intelligent energy management systems, which provide optimum performance using the least energy possible. FANUC is a global leader in CNC systems, currently holding 65 percent of the market share in the global CNC sector.

FANUC was founded in 1956 by Dr Seiemon Inaba. The corporation now has more than 2000 robots working on its own lines, with more than 250 offices and 5,200 employees worldwide.

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A glimpse into the future

Horn Technology Days took place between 10th and 12th May 2017 in Tübingen, Germany, marking the sixth time the event has been held. Eight presentations and associated practical demonstrations provided the centrepiece for the event. The two manufacturing plants of Paul Horn GmbH, plus the Horn Hartstoffe GmbH plant, also opened their doors to visitors. Rounding off the Horn Technology Days were various exhibitions from an exceptionally wide range of customer industries as well as around 40 partner companies attending as co-exhibitors. The event welcomed more than 2,800 visitors. Customers and the press were treated to full guided tours and demonstrations.

Lothar Horn, managing director of Paul Horn GmbH, says: "We don't see our Technology Days as a promotional event. We want to engage with our customers in order to advance technology, innovate and pool our knowledge. This is also why the presentations are application-specific rather than product-specific."

Most of the specialist Horn presentations, which numbered eight in total, were supported by practical demonstrations. The presentations were available in up to five languages: German, English, French, Italian and Turkish. The presentation included: High-feed milling cutters for cost-effective titanium machining; Turbo-whirling and rotary whirling; Perfect gear teeth; Trends in grooving and parting off; Micromachining using lathes; Powerful milling systems;

Coatings and solid carbide cutting inserts with raw sintered precision interface. The company Tyrolit delivered an additional presentation entitled "Adjusting cutting tools".

Horn Technology Days take place every two years. Lothar Horn has already announced the next event, scheduled for 2019. "In 2019 our company will be 50 years old. It is an Important year for us."

Horn in brief

Paul Horn GmbH in Tübingen, Germany has manufactured high-precision cutting tools and accessories since 1969.

The company currently has around 930 employees in Germany and 400 elsewhere. It develops and manufactures solid carbide tools as well as carbide, CBN and PCD indexable insert tooling in Tübingen and Gomaringen, Germany. In 2016, the company recorded sales of approximately EUR 167 million in Germany.

Abroad, HORN is present in more than 70 countries on all continents. Besides in Germany there are additional production facilities in England, Italy, the Czech Republic and the USA.

State-of-the-art, in-house manufacturing

To further extend its strong position in the global market, the company has built an additional manufacturing plant in Tübingen with a production area of approximately 5,500 square metres. This was completed in 2008 and is adjacent to its head office and

existing production area of around 6,000 m. The production processes were reorganised when the plant started operation.

In 2011, a new plant for Horn Hartstoffe GmbH was built covering an area of around 5,000 square metres. This enables all shaping processes for carbide tools to be carried out in-house (investment in 2011/2012: approx. EUR 30 million). The new plant has also been producing blanks and wear parts made of carbide for other companies since 2013.

In 2016, Horn moved into a new manufacturing plant covering a total area of 20,000 square metres dedicated to tool holder production, the coating department and logistics.

Furthermore, a new administration building was added. The total amount invested in the two buildings amounted to 70 million Euros.

Andreas Vollmer, sales manager & board member, says: "The new production site, in plant number two, has approximately 20,000 square metres which means we have an administrative area and a production area. With the production area, it means we have roughly doubled the production size here in Tübingen. There is a clear statement from Lothar Horn that Tübingen will remain the technical centre for future developments. Also, any kind of developments and technological advantages that we generate here will be transferred to our manufacturing sites outside of Germany."

"The total investment last year was around 70 million Euros, which is quite extraordinary for a company of our size, but it shows our belief in the future of the company and what we want to achieve. In addition, we purchased a building in the USA which will triple the size of Horn in the States in the next three years. If you include the USA then you are looking at a total investment of 82 million Euros."

Solutions from Horn

In order to machine titanium materials such as Ti6Al4V, which is in widespread use in the aerospace industry, Horn has developed an impressive portfolio of special tools that are able to overcome the main problems associated with processing titanium, thanks to sharp cutting edges, a positive rake angle, a large relief angle and polished



Lothar Horn, CEO, Paul Horn GmbH

cutting edges. For the specific purpose of machining titanium in the aerospace and medical technology sectors, Horn has developed the cutting material grade TSTK for its solid carbide milling cutters, which boasts good tribological properties, high temperature resistance and low discharge of heat into the substrate, therefore providing a sort of heat shield. Another important aspect that had to be taken into account in the development of solid carbide end mills was to endow them with different helix angles and a different pitch. This results in a soft, low-noise cut and prevents vibrations. The titanium range from Horn comprises a completely new series of solid carbide milling cutters with diameters from 2 mm to 20 mm (0.078" to 0.787"), four or five cutting edges and 2 x D and 3 x D versions.

Key markets

Horn's product range includes more than 120,000 variants. The proportions of standard and special tools are approximately equal. Around nine million inserts in batches of 100 pieces on average are produced annually, 97 percent in automated lines.

The company's main customers are companies in the automotive, aviation and aerospace, mechanical engineering, chemicals, medical technology and tool and mould making industries.

Andreas Vollmer says: Automotive for us, of course, is the largest sector we are supplying. This accounts for between 60 and 65 percent of our entire business. When it comes to our core business, we are definitely the biggest cutting tools supplier in Germany."

Horn's core in-house expertise comprises research and development, coating technology, carbide production and manufacturing technologies.

Harald Haug, head of export, says: The philosophy of the company is to make a tool. We want to make a tool on one machine and with one setup.

An ongoing success story

With an order intake of around EUR 275



A selection from the Horn product range



View into the modern production at Horn

million (worldwide), 2016 proved to be the most successful year in the company's history. Andreas Vollmer says: Over the last 49 years, we have generated more than 125,000 individual solutions for customers worldwide. Which means there is also a large amount of knowledge and knowhow behind the products for all specific applications. My target is that we achieve a growth rate of around 10 percent turnover for the whole group in 2017."

Training and advanced training

Paul Horn GmbH is currently training 60 apprentices. 15 apprentices commence training with us every year on a four-year programme. These skilled workers of the future train for a career in industrial mechanics in a dedicated area covering 1,200 m². The company also provides an opportunity for apprentices from other companies to get involved as part of their preparation for examinations.

Andreas Vollmer explains: "We need skilled people. We need well educated and well trained people using the latest technologies and implementing them in our production here. This is so we can increase our capacity and our productivity, but not significantly increasing the number of employees that we have."

Horn Academy

The Horn Academy provides training, advanced training and qualifications for customers and employees. Advanced training for industrial cutting tool specialists, as well as retraining of machine and systems operators and IT office assistants, open up new career paths.

Lothar Horn says: "It is important to us



A comprehensive choice for titanium machining

that the next generation are coming with a feeling for Horn and with a heart for Horn."

Harald Haug adds: We are investing millions in apprentices. It is essential for us to invest in our workforce. I have three technicians currently working in my export team who were apprentices."

Emerging markets and the future

Whilst it's clear that Horn has an enviable worldwide reputation, the company is experiencing ever increasing growth in new markets. Andreas Vollmer says: "China was a very nice surprise for us in 2016. We started our sales organisation there in 2013 and we grew by 70 percent in 2016. China for us is a positive example of setting up our business. Since day one we have been very successful and we have a clear strategy there for local and regional distribution."

Andreas Vollmer concludes: Overall, we can offer a lot of technological answers to the questions that our customers have.

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MAPAL satisfies aircraft assembly with Al Stack Drills

During the assembly of aircraft, manufacturers frequently stack different aluminium alloys for the production of the aircraft fuselage. During final assembly, drill feed units are employed to drill holes for rivet joints in the aluminium alloys that form the ribs and outer skin of the aircraft. MAPAL has now developed its Al/Al Stack drilling line to resolve issues that arise during this assembly process.

Until now, minimum quantity lubrication (MQL) drilling has been used to cool the drills and countersinking tools. Despite the MQL application, coolant still got inside the aircraft, where further assembly steps are conducted simultaneously. Additionally, this form of coolant application still required extensive cleaning. As a result, the aerospace industry has been seeking a solution for the dry machining of the Al-Al stacks, MAPAL now has the solution.

Until the arrival of the Al/Al Stack drills from MAPAL, dry machining put significant demands on the tool performance and respective tool life, whilst generating burrs that cannot be accepted at this critical stage of aircraft production. Furthermore, the heat generation also had an impact on the properties of the two different aluminium alloys in use.

MAPAL took up this challenge and developed a new drill with a countersink step. This new Al/Al Stack Drilling series conducts the drilling for the rivet joints dry. The twin cutting edged carbide tool has an extremely positive cutting edge and a double point angle. This minimises burr formation and achieves better centring.

The coating of the drill prevents material adhesion to the cutting edge whilst a lead-in stage provides for an optimum bore quality and precision. With specially formed chip flutes, the Al/Al Stack Drills ensure optimum



chip removal. For cooling the drills, air is applied to prevent overheating of both the cutting edge of the drill and also the immediate vicinity of the fuselage. By cooling the cutting area and the aluminium, the new drills prevent burr formation. This compressed air supply is also used to blow out the chips.

One aircraft manufacturer is using the new drilling line for drilling the rivet holes on the longitudinal seam in the rear main span. Running at a spindle speed of 2,959 rpm and a feed rate of 0.154 mm, the 4.748 mm diameter drill also has a 100° countersink angle that enables the drill to reliably produce 1,500 holes with countersinks before the holes deviate from the extremely tight tolerance band of 4.73 to 4.805 mm. The drill dimensions and countersink angles can be specified by the customer and manufactured to order.

Triple cutting Tritan-Drill offers new replaceable head design

When it comes to meeting the demands of rising raw material prices, resource efficiency and streamlining inventory, replaceable head drilling systems are the first-choice option for tool inventory. For these reasons, MAPAL has further

developed its triple cutting edged Tritan-Drill that defines new standards in drilling. It is the first standard triple cutting edged replaceable head drill to reach the market.

The new TTD-Tritan-Drill indexable head and tool holder are joined by Hirth serrations that are extremely stable. This makes all the benefits and the performance characteristics of solid carbide equivalents possible as the Torque Transfer System (TTS) guarantees extremely high stability of the joint.

The three cutting edges ensure a homogeneous load on the connection, so any forces occurring during machining are transmitted uniformly to the steel tool holder. In addition, the connection guarantees optimum torque transmission whilst ensuring fast changeovers and remarkable radial run-out accuracy.

As a result, the TTD-Tritan-Drill can be used reliably and with stability even in difficult drilling situations such as inclined bore entrances or cross bores. The tool is perfectly centred via its pronounced drill tip and it reduces costs with the solid carbide material limited to the replaceable head.

The drill bodies for the TTD replaceable system are offered with HA, HB and HE shank designations and through coolant facility with drilling depths of 1 x D, 3 x D, 5 x D, 8 x D and 12 x D. With five different types of replaceable drill head, even problematic machining operations can be carried out in practically all materials in the diameter range from 12 mm to 45 mm.

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New geometries and coatings increase penetration and improve tool life

Allied Machine announces GEN3SYS XT Pro Line of inserts and holders

Allied Machine & Engineering, a leading manufacturer of holmaking and finishing tooling systems, has announced its new GEN3SYS® XT Pro line of high penetration drilling products. The product line features inserts and holders, designed with three unique geometries, as well as introducing two advanced coatings. Combining specific geometries and coatings to create the optimal solution for different machining materials, this next level of the GEN3SYS® high penetration drilling product line delivers top results.

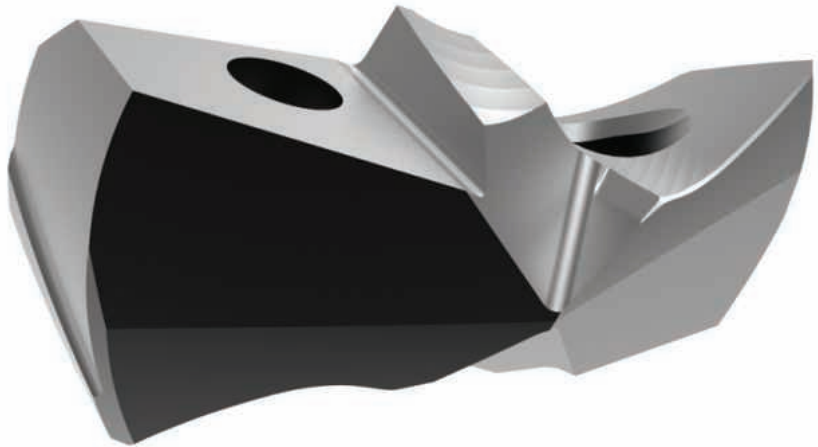
GEN3SYS XT Pro inserts have been designed specifically for ISO material classes, making tool selection easy. They are offered for steels (class P), cast irons (class K), and non-ferrous materials (class N). The drill inserts come in diameters ranging from 11 mm to 35 mm and are available in 0.1 mm increments. The inserts, designed specifically for steel and cast iron, have new AM400 series coatings, which provide increased wear resistance and tool life. Inserts for non-ferrous materials are coated with titanium nitride (TiN).

Holders for the GEN3SYS® XT Pro line are offered in depth-to-diameter ratios of 3 x D, 5 x D, 7 x D, and a new 10 x D. These newly designed holders feature an enhanced flute design that improves chip evacuation and an updated coolant configuration that increases flow and directs additional coolant to the cutting zone. The GEN3SYS XT Pro holders are available in both imperial and metric shank diameters.

Allied Machine & Engineering devotes its advanced engineering and manufacturing capabilities to creating the widest selection of value-added tooling available to metal-cutting industries around the world. Its tooling solutions deliver the lowest cost-per-hole in a wide range of drilling, reaming, threading, boring, and burnishing applications.

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ITC extends its aluminium milling reach with new series

To ensure the ever-evolving demands of its customer base are met, Industrial Tooling Corporation (ITC) has now developed yet another innovative new end mill series. The latest end mill series to arrive from the visionary R&D team at ITC is the new 3301 Cyber Series for the machining of deep cavities in aluminium components.

The new 3301 Series 3-flute aluminium roughing tool is a particularly long, yet extremely stable end mill that has the capacity to effectively machine inside cavities where competitor tools cannot reach. Designed for heavy-duty aluminium removal applications, the new 3301 Series has knuckled outer edge geometry for robust roughing with rapid swarf evacuation.

The centre-cutting solid carbide series is available in 6, 8, 10, 12, 16 and 20 mm diameters with the shank diameter identical to the cutting diameter. This maximises the stability and rigidity of the tool as it reaches into difficult to access faces and corners. Furthermore, when the optimised shank dimensions are combined with the edge and flute geometry, the new 3301 Series offers scintillating performance levels.

Ensuring the 3301 Series can reach such inaccessible areas, ITC has 'necked' the tool to offer maximum clearance and guarantee that shank interference with the workpiece is a thing of the past. This allows the respective diameters to offer a cutting edge of reach up to 18, 24, 30, 36, 48 and 60 mm. Despite this impressive reach range, the surface finish, tool life and overall stability are maintained by a geometry design that retains an 8 to 24 mm cutting length depending upon the tool diameter selected. As well as its impressive reach characteristics, the 3301 Series has been manufactured with an overall tool length from 90 mm for the 6 mm diameter tool up to 150 mm for the 20 mm diameter cutter. The extended neck length and overall length of the 3301 Series offers some major benefits to aerospace manufacturers continually machining pockets and cavities.

The respective tool diameters

7.5 mm 9, 11, 14.8 and 18.7 mm with the 18 to 60 mm reach. However, as a UK manufacturer ITC can extend the neck length or alter the neck diameter to accommodate the specific demands of the customer.

BIG KAISER centring tool for unrivalled ease of use

Industrial Tooling Corporation (ITC) has now announced the launch of a new compact centring tool designed for small lathes and turning centres, the BIG KAISER CTL-90.

The new innovation from BIG KAISER has a stationary dial gauge that faces the machine operator at all times, rather than rotating with the spindle of the lathe. This significantly simplifies the tool and lathe chuck centring process, thereby saving valuable setup time and improving operator productivity. In fact, machine setting can now be conducted from outside the machine when using the CTL-90. This makes the new setting device significantly safer than dial indicators that require the machine setter to lean into the work envelope.

The fine adjustment mechanism on the tool enables precise adjustment to within 10 microns with a stroke of 2 mm. Setting can be achieved with the spindle rotating at a speed up to a maximum of 100 rpm. With a magnetic base to make the task of tool mounting incredibly simple, the CTL-90 expands the operator's options with various mounting positions. The centring tool weighs 0.4 kg and consists of a dial indicator, magnet, adjustment bolt, stylus and a counter-balance weight.

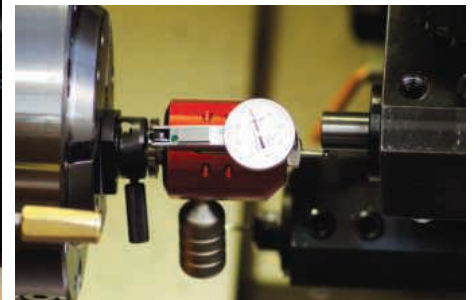
Peter Elmer, CEO at BIG KAISER, concludes: "For busy operators who often oversee multiple machines at once, ease of use is truly essential. By ensuring that the dial gauge is always visible and legible, this new centring tool brings a new level of convenience and efficiency to the operator."

Industrial Tooling Corporation (ITC)

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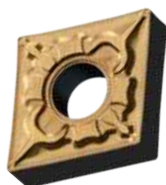
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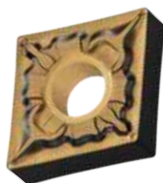
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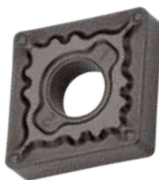
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ISCAR aerospace manufacturing 'Titanic' developments

ISCAR UK sales manager, David Jones explains the company's recent innovations within the area of titanium milling within the global aerospace manufacturing sector

The remarkable strength-to-weight ratio and high corrosion resistant properties of titanium has resulted in the ever-growing use of this important engineering material in many demanding sectors, not least the global aerospace industry.

The production of critical structural parts from titanium ensures that they deliver the required levels of performance and reliability whilst significantly reducing their mass. Although relevant to all users of titanium, the enhanced strength and reductions in weight that the material brings are of particular importance to the aerospace industry, as these advantages improve aircraft's performance and increase fuel economy.

The negative trade-offs produced by the use of titanium are the many problems uncounted when machining this difficult-to-cut material. When used in metalworking industries, the word 'titanium' normally relates, not only to pure titanium, but also to titanium alloys. It is sometimes stated that titanium machinability is similar to that of austenitic stainless steel. This proposition is more or less true if it relates to commercially pure titanium, although it is totally wrong with respect to treated and especially to alloys.

Machinability rating depends heavily on the type of titanium and its treatment. The machinability of the widely used annealed titanium TiAl6V4 is approximately 35-40 percent less than annealed stainless steel AISI 304. However, if we take the machinability of the aforementioned titanium grade as 100 percent, the so-called "triple 5", titanium 5-5-5-3, a major manufacturing headache for many machine shops, features machinability characteristics that are twice as difficult.

Machine tool manufacturers continue to introduce innovations and developments that make the cutting of titanium ever more effective. Modern machine tools allow operators to apply advanced machining strategies and to employ one-hit production methods. However, the typically low cutting

speeds used in the machining of titanium severely limit machine tools' efficiency potential and results in the cutting tool becoming the weakest element in the whole production system. In short, the cutting tool determines the productivity boundaries when machining titanium, and as such has become a major factor in the quest for a radical improvement of this situation.

Due to the low thermal conductivity of titanium, the main problem when cutting this material is the generation of heat. Poor heat transfer leads to considerable thermal loads being directly transferred to the tools cutting edge. Also, less of a problem when machining steel, titanium's modulus of elasticity contributes to vibration during cutting. As a result, surface finish and accuracy problems can be encountered.

Cutting tool producers continue to apply significant R&D resources to developing progressive tools for the efficient machining of titanium. Manufacturing titanium parts is a process with significant buy-to-fly ratio, when a large amount of metal needs to be removed. The eventual weight of a finished titanium part may be only 10 percent, or less of the original weight of a workpiece. Frequently, these parts will feature cavities, pockets and ribs that dictate milling as the main method for manufacturing. As a consequence, every new tool that is intended for the milling of titanium creates intense interest amongst the global aerospace manufacturing community. Therefore, the latest products from ISCAR, an acknowledged innovator in the field, always attract the attention of the world's manufacturers involved in the machining of titanium.

Tool material is of fundamental importance in the success of cutting tools, especially for use when indexable milling difficult-to-cut aerospace materials, in particular titanium. Within this challenging field, ISCAR has developed a new carbide grade IC840. The word "new" relates to all grade elements: IC840 is characterised by a newly cemented carbide substrate and an



innovative hard PVD coating. The grade substrate is highly resistant to thermal cracks, the bronze-color, 'chocolate', coating boasts high oxidation and chipping resistance, whilst an advanced post-coating treatment improves overall toughness. The advantageous combination of the above IC840 features gives users the opportunity to significantly increase efficiencies when milling titanium. ISCAR believes that the new 'chocolate' will definitely suit the taste of the manufacturers of titanium components and increase the performance of indexable cutters.

As previously mentioned, the milling of titanium usually involves removing considerable amounts of stock. Considered true 'workhorses' in this field, extended flute indexable tools (porcupines) are intended for the rough cutting of deep pockets, cavities and wide edges. For these common operations, ISCAR has developed the HELITANG H490, a family of advanced milling tools with tangentially clamped inserts, and also the MILLSHRED P290, a range of milling tools carrying serrated inserts that provide an efficient chip splitting (even chip chopping) effect. In addition, the company offers HELITANG FIN, a family of tangential porcupines that were designed especially for semi-finish milling.

ISCAR has recently introduced a new

group of extended flute shell mills related to the proven and popular HELIQUAD family. These mills carry one-sided square inserts, which are clamped radially. Some users have asked why has a company, well known for its commitment to innovative cutting geometries, equipped these new mills with "traditional" simple square inserts? This is due to the deceptively simple, new extended flute tools that feature a well-designed structure resulting in significantly improved dynamic rigidity and anti-vibration strength. In addition, radial insert clamping enables the inclusion of a chip gullet with a generous volume that answers the requirements of free chip flow when milling at high metal removal rates (MRR). Also, the tools of more popular diameters have internal channels, which are designed for machining with a high-pressure coolant (HPC) supply. Even these "simple" square inserts are characterised by a progressive cutting geometry that provides extremely effective titanium milling.

If HELITANG H490 and MILLSHRED P290 are intended for productive roughing and HELITANG FIN for the semi-finishing of titanium workpieces, from an application point of view, the new HELIQUAD extended



flute shell mills provides high-efficiency milling resulting in semi-finish conditions.

ISCAR also recently introduced the Ti-TURBO family of solid carbide endmills in a diameter range of 6 to 20 mm. The new family was designed for finishing operations and also for high-speed machining (HSM) of mainly slots, through the use of the trochoidal technique. Trochoidal milling features a small width and significant depth of cut, combined with a tool path dictated by a trochoid curve. Under such conditions the tool "slices" metal up at a high rate. Here, the engagement angle is small and

the produced chips are very thin, this dramatically reduces the thermal load on the tool.

ISCAR's MULTI-MASTER versatile line of assembled tools with replaceable solid carbide cutting heads, has been recently enhanced by the introduction of new, six-flute, fast feed milling heads with central coolant holes. The ultra-fine grain carbide substrate of the heads, protected by the advanced AL-TEC coating technology, provides outstanding wear resistance. The heads are used in productive high feed milling (HFM), resulting in significant reductions in the cycle times of roughing operations.

Manufacturers of titanium parts are constantly placing new demands on cutting tool producers. In order to meet these challenges, on a regular basis, cutting tool producers are forced to think out of the box.

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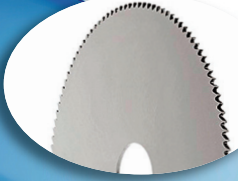
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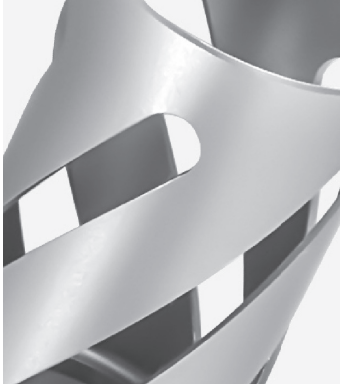
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In safe hands with SCHUNK

Shaping a vision of the future

John Barber, editor of Engineering Subcontractor, visits SCHUNK in Germany

A company with a firm grip on the future

As the world's biggest manufacturer of Jaws, SCHUNK needs no introduction. With 11,000 standard components, the family owned company offers the world's largest range of clamping technology and gripping systems and with more than 2,550 SCHUNK grippers, the broadest range of standard gripper components on the market. The entire gripping system offering comprises more than 4,000 components and the company has over 25,000 customers worldwide. The company continues to grow year after year.

Harald Dickertmann, CSO, says: "In 2016 SCHUNK achieved consolidated revenue of 400 million euros. That means the group succeeded in continuing the exceptionally high growth of the past years."

It would be easy for a company in this position to simply consolidate, but SCHUNK has always been at the forefront of change whilst also facing up to the challenges of the future. With digitisation and the collaboration between human and machine becoming increasingly prominent, the company has introduced a number of exciting solutions for Industry 4.0, service robotics, human/machine collaboration and additive manufacturing. In fact, automation now represents 50 percent of what the company does. Automation and metal cutting are two of the strongest industries



for SCHUNK, but there are a number of other areas that it has targeted for growth.

Markus Kleiner, MD of SCHUNK in Mengen, says: "Important accelerators for growth are the automotive industry and its suppliers, the electronics industry and the consumer goods sector. We also see potentials for growth especially in small and mid-sized enterprises, which are increasingly starting to automate their processes."

Harald Dickertmann confirms: "My biggest target is to be more diversified. A strong ambition of SCHUNK's is to set the pace on the automation side. I would not like to sell just products but also productivity."

New Co-act Gripper Program

Human/robot collaboration requires intelligent and safe grippers. The SCHUNK Co-act gripper JL1 is the first intelligent HRC gripper which directly interacts and communicates with humans. A touchscreen in the gripper housing and LED panels in the fingers enable communication with operator. Even at the basic level, the SCHUNK Co-act gripper program fulfils the three key requirements of a safe human/robot collaboration in the future.

They never cause injury when gripping, they always detect contact with a human and they never drop the gripped object.

The JL1 Co-act Gripper was recently awarded the coveted Hermes award, recognising its quality. Henrik A Schunk, managing director and CEO, says: My team and I are proud of the success of the SCHUNK JL1 Co-act Gripper, which is a decisive step on the way to highly flexible handling scenarios for Industry 4.0 and therefore for smart production.

"The collaboration between humans and robots has long since become a reality and has already become the standard for many of our customers. Our HRC gripper portfolio "Co-act" has also become the standard. It is the only one on the market that has secure universal and miniature grippers for all conventional cobots."

Ralf Becker, head of the research department, adds: "CEO Henrik A. Schunk sees the Hermes Award as an important milestone in the history of the SCHUNK company group. When SCHUNK was named the winner of the award for 2017, everyone at the company was proud of this tremendous success."

Various "senses" are used to record,



evaluate and communicate situational, ambient and operational conditions. Thus, in the future, SCHUNK Co-act grippers will be able to transmit all relevant data about processes and surroundings to the control and production systems. The focus will be on the intelligent flow of materials, process optimisation and continuous documentation.

World's first DGUV-certified gripper for collaborative robots

The SCHUNK 5-finger hand SVH has been certified and approved by the German Social Accident Insurance Association (DGUV) for collaborative operation. In so doing, SCHUNK has taken a decisive step forward on the way towards safe human/robot collaboration.

The SCHUNK 5-finger hand SVH grips nearly as perfectly as the human hand. The electronics are completely integrated into the wrist, which allows the SCHUNK 5-finger hand SVH to simulate nearly all human hand movements. Due to the moving parts with a total of nine drives, various gripping operations can be executed with high sensitivity. Elastic gripping surfaces ensure a reliable grip on objects. The SCHUNK SVH can be connected with the market-standard and lightweight robots via defined mechanical interfaces.

Jakob Khoury, product manager for Gripping Systems, says: "By 2018 there will be 1.3 million robots working in company's. The focus for us is to make the robot more flexible and more safe."

Digitisation and digital technologies

As a leading technology supplier for technology equipment of robots and production, SCHUNK is "closest to the part". Its components and services play a decisive role in digitalisation and production. In recent years, the company has been driving the digitisation of industrial production with its smart components.

Dr Martin May, head of cyber physical systems, says: "European industry has

excellent prospects for the future as a result of digitalisation and Industry 4.0, the mechatronisation of assembly and handling systems, and the trend toward human/robot collaboration. Robots are a significant factor for economic growth and prosperity throughout the world. Our goal has to be to stay on the ball with robotics and digitalisation, to continue developing Europe's leading position in technology and to establish entirely new automation scenarios.

"New digital technologies will allow us to bring automation to a higher level. For the first time, new technologies have made it possible to maintain a continuous real-time database in production and therefore to create the necessary transparency for further optimisation of processes. Our grippers are at an exposed position in the handling processes. They are "closest to the part", which means they are in direct contact with the workpiece or component. Our goal is to use intelligent grippers to acquire information about the gripped component, the process and also the gripper itself, to process this data and to execute a suitable response."

Industrie 4.0 and the future

So how do SCHUNK's automation products fit in with Industrie 4.0. and what can customers expect to see from the company?

Dr Martin May explains: "SCHUNK sees the trend toward Industry 4.0 as an opportunity to improve and to redevelop products, production and business models. The main goal is to achieve full flexibility of the production processes while maintaining maximum transparency and cost effectiveness. The mechatronics initiative of SCHUNK is already providing solutions today. With more than 300 standard electric components SCHUNK offers the world's largest selection of mechatronic components for gripping systems. The smart SCHUNK modules enable condition and process monitoring as well as communication directly at the component level. They therefore close the gap to the handling object and enable the uninterrupted flow of information from the gripper finger all the way to the ERP system.

"Our experience so far is very positive. In an Industry 4.0 assembly cell, SCHUNK demonstrates, together with project partners, how pick & place units, 3-axis gantries, robots and mobile platforms can



cooperate autonomously during assembly, inspection, packaging and transport to allow a smart production process. With each new component and each prioritised order the cell repeatedly invents a new choreography. During this process, each single process step is monitored in detail by the sensors and signalled to the higher-level handling system, or even to the plant controller and the ERP.

"Smart, intelligent SCHUNK grippers, lightweight arms, pick & place units and linear motor drives enable decentralised control at the component level and therefore a dynamic and flexible process. Above all, the intelligence of handling components will be a decisive key on the way to the smart factory. We will continue to develop this know-how and to use it actively in future projects."

The spirit of SCHUNK

Around 10 percent of SCHUNK employees in Germany, of its 1,600 workforce, are in education and a number of apprenticeships join the company each year. For SCHUNK a pioneering spirit and absolute perfection go hand in hand with social responsibility and many apprentices go on to work for the company and stay for the long term.

It soon becomes clear that a key hallmark of the company's success story is its ability to listen to the requirements of its customers, to give them choice, and continue to innovate. Raoul Dessel, head of sales Europe, says: "It's important to give the customer the opportunity to select his own product. The modern customer today wants to inform himself."

Henrik A. Schunk concludes: "We innovate all of the time, but only if we are convinced of the benefits for our customers."

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When chips are flying

Toolholding plays an important role in process reliability

In 2016, Pilatus Aircraft Ltd installed new manufacturing systems for machining structural parts made of aluminium. In order to achieve the desired surface quality and precision during high speed milling operations, the aircraft manufacturer continuously relies on the solutions provided by HAIMER, which includes a large selection of tool holders and the corresponding shrinking and balancing machines.



Whenever someone in the precision machining industry talks about flying, one thing is typically brought up: chips. This also applies to Pilatus Aircraft Ltd, the only Swiss aircraft manufacturer. At its headquarters in Stans, Switzerland, everything generally revolves around the topic "flying", but machining structural parts also plays an important role. In 2016, Pilatus invested in a completely modernised volume-machining system in order to further improve the quality and efficiency of the production. Core elements of the enhanced production are two new flexible manufacturing systems that are run with full automation and guarantee the highest quality in a stable process.

Walter Duss, director of milling, points out that fine-balanced tools are absolutely necessary: "Only the high balancing grade of the complete tool assembly, balanced on a HAIMER balancing machine, together with HAIMER toolholders can guarantee vibration-free machining and surfaces without any chatter marks. Furthermore, the high run-out accuracy significantly increases the lifetime of the spindle and tools."

According to the experience of Patrik Odermatt, team leader mechanical processing and responsible for the internal division of tools at Pilatus, high quality tool holders that offer long-term stability and

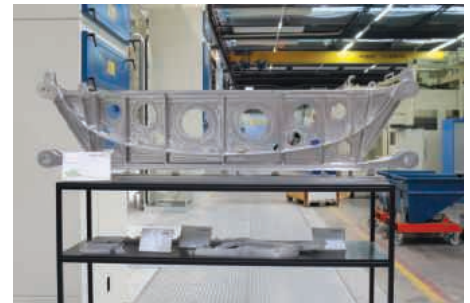
run-out accuracy definitely pay off. It is for this reason that he has been working with HAIMER in Igenhausen for many years. He uses HAIMER shrink fit chucks and high-precision collet chucks together with the corresponding presetting, shrinking and balancing machines that are available at the Pilatus toolshop which serves as its internal tool management service centre.

Patrik Odermatt says: "Regarding such topics as quality, price-performance ratio, consultation and support, our experience with HAIMER is very positive. That's why we made the decision to continuously and solely rely on toolholding technology from HAIMER when it comes to our new manufacturing system. We exclusively use tools that are clamped into HAIMER standard shrink fit chucks, ultra-short and long power shrink chucks as well as power mini shrink chucks, power collet chucks and special face mill arbors."

Since Pilatus is working with many different parts that are extremely thin with wall thicknesses ≤ 1.2 mm and deep pockets, the wide range of HAIMER tool holders was an important consideration. Also, HAIMER has shown flexibility regarding the spindle interface: for the new manufacturing systems, a special HSK-A 63/80 toolholder was necessary. After close cooperation with Pilatus, HAIMER developed a program for this interface and added it to its standard delivery portfolio.

HAIMER has also proved to be innovation-driven with its patent pending mechanical locking Data-Lock system that fixes the RFID data carrier onto the toolholder. Pilatus uses this solution to ensure that even at the highest rpm the data carriers are securely fixed and cannot separate from the toolholder.

According to tool expert Patrik Odermatt,



one of the greatest advantages of working with HAIMER is the fact that you can get all toolholding technology from one single source.

Patrick Odermatt concludes: For every HAIMER Shrink fit chuck the required parameters are already integrated into the shrinking machines. The performance and heating time are ideal and guarantee process-reliable shrinking at the push of a button. Balancing is also easy to perform."

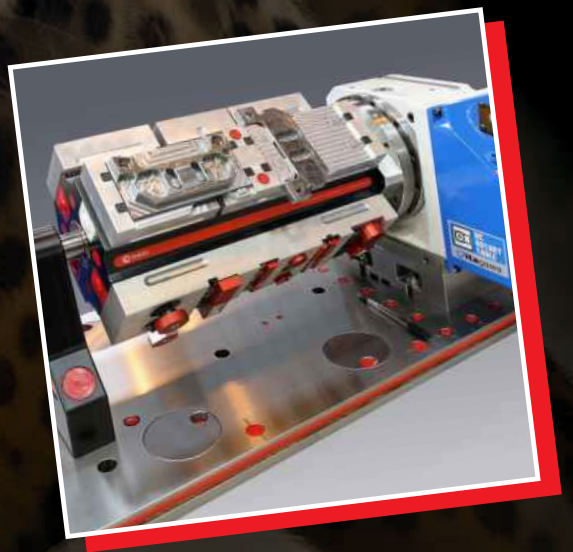


HAIMER is a family run, medium sized company located in Igenhausen, Bavaria near Augsburg, Germany. It designs, produces and sells innovative, high precision products for metal cutting as well as for other branches including automotive, aerospace, energy, rail and general machining. It also has a large offering of toolholders in all popular interfaces and lengths, including its shrinking and balancing machines, as well as its 3-D sensors. The product offering includes solid carbide cutting tools and grinding wheel adapters.

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Harnessing modern workholding for competitive advantage

High productivity, consistent quality and fast machine changeovers are key, in order to enable engineering subcontractors to maintain their competitive edge, not only against suppliers based in the UK but also those in low-wage economies. To meet the challenge, contract machinists use the power and versatility of high capability CNC machine tools. However, like a Grand Prix car running on the wrong tyres, ineffective workholding will prevent even the most capable machines from delivering their full potential and competitive advantage.

The first prerequisite of any workholding solution is to provide a rigid, secure and consistent location for the workpiece. Using traditional machine vices, a single workpiece is typically clamped by a moveable jaw against a fixed jaw, which normally deflects as clamping pressure is applied, making it difficult to achieve repeatable results.

By contrast, modern workholding systems such as Chick Qwik-Loks from 1st Machine Tool Accessories squeeze the moveable jaws against a central fixed jaw, cancelling the opposing forces to provide a reliable reference point. Moreover, the units enable two components to be machined in a single



Five Chick Qwik-Lok twin-station workholding units from 1st MTA on the table of a vertical machining centre at Gosport-based subcontractor, QCD

cycle, rather than just one, immediately increasing productivity.

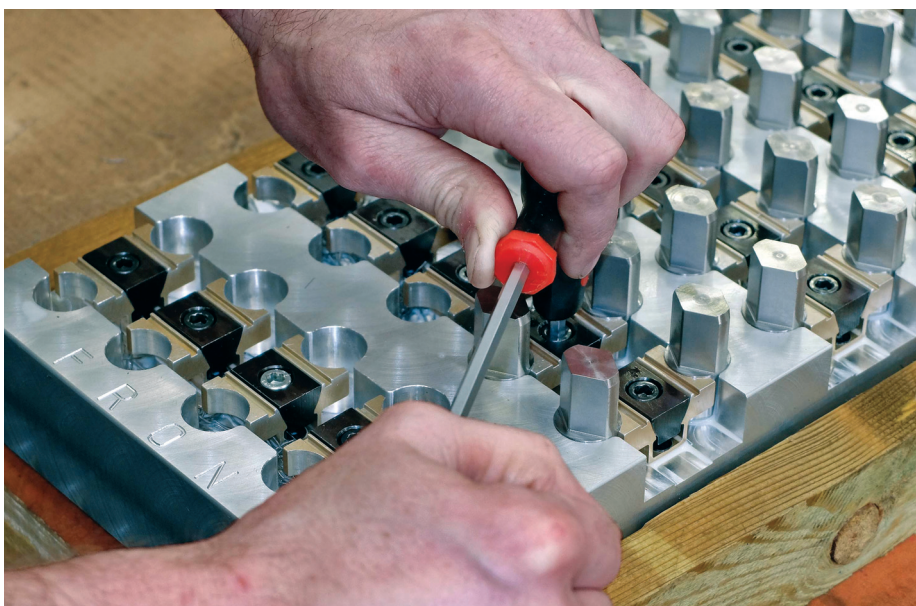
Consistency of machining is also dependent on the applied clamping

pressure, which should be sufficient to ensure rigid location without deforming features such as thin walled webs or bores. In the metalcutting environment, holding something 'tighter' is by no means 'better' if accurate and repeatable results are to be achieved.

After fulfilling the fundamentals, modern workholding systems need to minimise inefficiencies in the machining cycle to deliver a high proportion of cutting to idle time on the workpiece as well as maximum utilisation of the operator's time.

With a CNC machining centre, you don't just buy the spindle but also a machining envelope defined by the axis travels. Old fashioned vices enable only one part to be machined at a time, wasting valuable capacity. Furthermore, as parts are machined singly, cycle times will often be too short to permit the operator to walk away.

Advanced workholding systems provide a modular approach, enabling productivity to be increased progressively. Stage one is substitution of the standard machine vice by a twin station unit that permits one side of two components to be machined, effectively



An aluminium faceplate, which has two recesses machined into the underside, removed from a machining centre to which it was secured on a Qwik-Lok slide assembly, after the jaws had been removed. Here, Mitee-Bite clamps secure components firmly for milling. (Photo taken at turned parts subcontractor, Empire Manufacturing, Hoddesdon)

doubling operator walk-away time as well as halving the number of tool changes needed per component. The next step is to use multiple twin-station units, up to five on a standard machine table, which increases to 10 the number of component sides available for machining.

Alternatively, instead of the Chick Qwik-Loks holding components directly, an aluminium faceplate with two machined recesses on the underside can snap onto the Qwik-Lok slide assembly in its base, after removal of the jaws. It allows the faceplate to be secured in seconds to a repeatability measured in microns, like during a zero-point pallet change. The faceplate can then be used in conjunction with other workholding devices, such as Mitee Bite Uniforce machinable clamps from 1st MTA, to secure dozens of components quickly in a single setup.

To take better advantage of the available vertical space within the machining envelope, components can be mounted on indexing sub-systems, such as Chick's System 5 ISS units (www.1mta.com/indexer-subsystem). These tombstones can be mounted between a 4th axis indexer and tailstock on the table of a vertical

machining centre to present four components or sets of components to the spindle. Throughput and operator walk-away times are therefore increased dramatically, the more so if several ISS units are mounted side by side.

It also means that machines run unattended during operator breaks and one person can look after more machines, raising productivity and reducing costs. Moreover, by similarly setting up the machine before the operator leaves for the day, extra hours of production are gained for little additional expenditure.

1st MTA operates a consultancy service to identify the optimum workholding solution for any given application and offers what it claims is the largest variety of clamping products under one roof for securing round and prismatic shaped components.



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Roemheld zero point is a sound investment for Bowers & Wilkins

Bowers & Wilkins is renowned throughout the world for producing best in class loudspeakers used in leading recording studios and the homes of serious audio fans. From its UK manufacturing base in Worthing, the company produces the iconic Nautilus and the flagship 800 D3 Series loudspeakers incorporating Diamond tweeter technology. The complex technologies behind the design of the wooden speaker cabinets of the 800 D3 Series require that wood be machined to extremely high tolerances and a great deal of customisation take place during the process. As a result, each cabinet takes 31 days to manufacture. To facilitate faster tool changes without any loss of accuracy, Bowers & Wilkins decided to implement zero point mounting systems from Roemheld (UK) Ltd.

Bowers & Wilkins chief engineer, Jerry Gray, explains: "We had seen Roemheld zero point systems in action being used for rapid tool changing in another large woodshop so we contacted Roemheld on the basis of that recommendation."

Senior production engineer, Derek Saunders, was instrumental in designing the project to fit Stark Easy Click zero point to 12 machining tables within seven machines, five of which were twin table machines and two were single tables. It proved to be quite a task as the tables on the old CNC machines had multiple channels for vacuum holding and Bowers & Wilkins wanted to maintain that capability as well as enabling the use of the Roemheld zero point mounting system.

Derek Saunders says: "Inca Geometric did a good job making the tables which made fitting the 180 Roemheld Easy Click zero point components into pockets very easy. Each table had a minimum of six Easy Click zero point elements and the largest table was 2 m x 1.25 m. We modified the current jigs to add on the new zero point components."

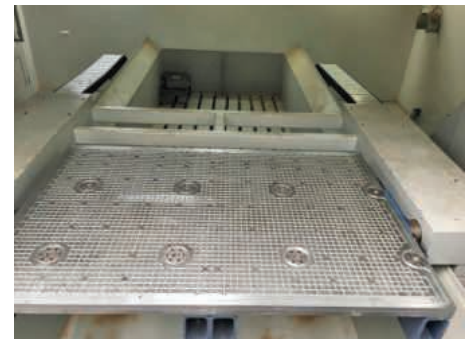
The project also had to fit around the company's busy production schedule. With three shifts per day, the company's woodworking production operates 24 hours a day, 6 days a week. Roemheld had to ensure the parts were ready to fit in with the



planned downtime and at times had to deliver to extremely tight timescales. Once in place, the Roemheld Easy Click zero point system reduced setup times from 2 - 4 days down to just a matter of hours.

Jerry Gray says: "We had two measures of success. We had to be able to take the tool out and put it back without any alterations to programming or tooling. We also had to be able to change the product over, load the tools and the only change allowed was to set the tool lengths. We achieved both of these measures as well as significantly reducing our setup times. This makes us more flexible and agile as a company since we can work on smaller batch sizes and undertake two or three tool changes a day."

The Roemheld Easy Click components are in use on the machines making the Bowers and Wilkins' flagship 800 D3 Series range of loudspeakers. The sculptural, curved fronted, reverse wrap cabinet has been designed to reduce the surface area around



the driver to increase the accuracy of sound reproduction. The internal bracing system uses criss-crossed interlocking panels of thick, solid plywood and incorporates metal components to increase the rigidity of the cabinet and is optimised for each of the models in the range.

To manufacture these aesthetic yet highly engineered cabinets, the wood is worked to the highest tolerances. Peeled beech or birch ply is built up in painstaking layers on presses to create the thick cabinet panels. Walnut veneers are used as a finish and the company uses the top 10 percent of Grade A knifecut so each face of cabinet pairs can be matched.

As well as incorporating easy click zero point components into the plant, Bowers & Wilkins also introduced Roemheld QDC carrying consoles, ball bars and hydraulic clamps onto three hydraulic presses in order to improve die change times.



WORKHOLDING

Derek Saunders says: "As a result of installing Roemheld QDC, we reduced the time taken to change dies from two hours to less than 27 minutes."

Bowers & Wilkins has been manufacturing for over 50 years music systems, cinema systems and more recently wireless music systems and headphones. The company has over 900 employees located throughout the world, with over 300 based in Worthing. The



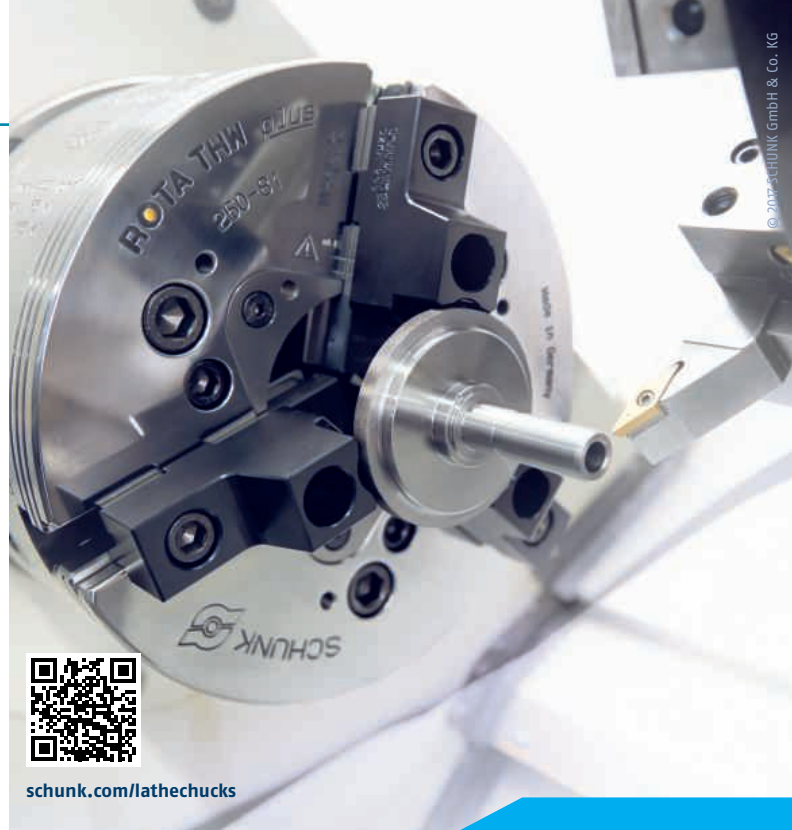
company prides itself on in-house design and development expertise and has an R&D team of over 100 people. To ensure the highest level of quality and attention to detail, if a component is key to a product it is made in-house. Efficiency boards are run on the line so every employee on the shopfloor can see them and productivity initiatives such as 5S are in place. The company is committed to apprenticeships and currently employs four apprentices in partnership with a local college.

The Worthing site also manufactures the iconic Nautilus, the end result of an ambitious research and development project to create, as near as possible, the perfect loudspeaker. Its curved, seamless exterior is moulded from 10 mm thick, GRP and a pearlescent finish is achieved with 12 lacquer coats containing aluminium and mica particles and a unique baking and curing system. Nautilus has received a Millennium Award and has been seen at the Design Council and the Design Museum London.

Bowers & Wilkins has an annual turnover of around £130 m and exports to over 80 countries worldwide. The company has received the Queen's Award for Export on two occasions and also a Silver Award for Investors in people.

Ian Shelley, Roemheld southern area sales manager, says: "We have supplied workholding components to woodshops before to enable rapid tool change so when Bowers & Wilkins approached us we knew our products could help improve their setup times and flexibility. They designed what they needed to implement and meet their project objectives and we worked with them closely to ensure they achieved their goals within their exacting timescales."

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Time and cost-saving solution

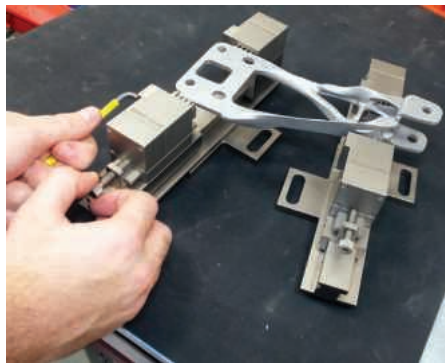
One of the first Matrix pin vices in use in the UK is producing a time and cost-saving solution when finishing machining prototype and first-off complex free form parts created using the additive manufacturing technique (AM).

The vice was supplied by ETG Workholding to Renishaw's digital manufacturing centre (DMC) based at its HQ site near Wotton-under Edge, where self-sufficiency plays a major role with prototyping and component development projects undertaken using Renishaw's own RenAM AM500M additive manufacturing systems. The centre also doubles as a demonstration facility for Renishaw's extensive AM manufacturing expertise.

RenAM 500M systems use metal powder bed fusion technology to build complex components straight from the digital CAD files. Many are prototypes for future Renishaw machine and process developments but, almost without exception, all feature complex shapes, thin wall sections or have complex geometries. Consequently, they are difficult to clamp when being machine finished.

Traditionally in these circumstances, a fixture would have to be created involving an initial CAD drawing, prototyping, machining and assembly with inevitable time and cost implications. Now, using Matrix pin vices, Renishaw technicians can create a part specific, stable, secure and repeatable workpiece clamping configuration that can be set up in a matter of minutes.

Renishaw has two versions of clamps from the Matrix Silver X-clamp range: a two-rail mounted X clamp 40's for small components and a larger X clamp 125 version which has the capability to offer 'wrap around' clamping that creates an optimised grip on the workpiece. Both are superior to conventional two or three point holding



devices where there is also the risk of surface damage at the clamp points.

In Renishaw's DMC facility, the pin vices are fitted to the machine tables on Fanuc RoboDrill D21L 3-axis machining centres which are additionally equipped with 4/5-axis rotary tables to give up to 5-axis capability as required.

Chay Allen, rapid manufacturing manager at the centre, explains how productive the vices have been: "Because the great majority of our machining throughput is literally one off, workholding and fixturing is a potential bottleneck. We saw the Matrix on ETG's stand at MACH 2016, took a few examples of free form parts to their Hyfore facility for real-time machining tests and decided this was the way forward. They have saved many production hours due to their versatility and we have been impressed with how they hold their accuracy on repeatable machining operations."

Renishaw employs its own probing systems to inspect the finished machined parts but also uses 'NC-Perfect Part' digital monitoring software from its associate company MSP for checking surfaces, contours and alignment machining. All workpieces are heat treated before machining commences.

Chay Allen says: "The smaller vices enable us to secure complex components across the two, while the large version accommodates bigger shapes, however complex. We are not using the clamping capacity to its full capability but the security

of grip, given the complexity of the workpieces, coupled with the significant time savings have enabled us to considerably streamline component throughput."

ETG Workholding experts have first-hand experience of a wide range of clamping and fixturing techniques and can be contacted to discuss specific requirements or undertake demonstrations.

ETG Workholding is a leading supplier of workholding & machine accessories offering a comprehensive range of standard products to bespoke fixtures. It now offers thousands of specialist metal cutting related products alongside a bespoke fixturing design and manufacturing capability using the well-proven Hyfore capabilities.

Its website has over 100,000 individual products for sale covering the spectrum



from collets and workholding accessories to precision engineering equipment such as probing and quality control products as well as everyday consumables from leading brands.

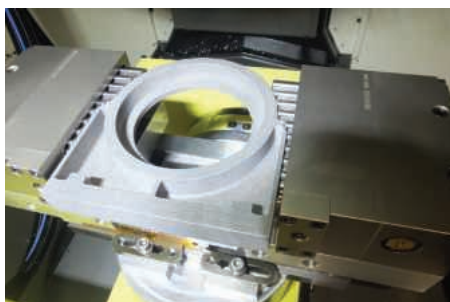
ETG Workholding is based in Coventry and is skilled in the manufacture of a wide range of manual and automatic workpiece holding and handling systems for manufacturing industry.

ETG Workholding

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Unique hydraulic chuck

Gewefa has developed a unique hydraulic chuck for holding Sandvik Coromant EasyFix® boring bars, that removes the need for reduction sleeves while eliminating run out and guaranteeing the centre height at the insert cutting tip.

Setting time is substantially reduced, by as much as 75 percent, with the Gewefa design featuring a spring plunger mounted in the toolholder body. This locates into a fine groove machined into all Sandvik EasyFix boring bar shanks and aligns the bar position precisely for the correct centre height. Along with the hydraulic chuck operation, a secure grip is guaranteed with integral anti-vibration damping to optimise the machining process.

By eliminating the previously accepted method of securing boring bars into a toolholder with reduction sleeves, the opportunities for inaccuracy and bar deflection during boring operations are now greatly reduced.

Gewefa also offers a system for other proprietary systems with the ground angle on the back end of the bar locating against a



This new hydraulic chuck from Gewefa is suited to all Sandvik EasyFix boring bars

stop pin at the base of the toolholder. This ensures precise central positioning and orientation with the bar then locked into the hydraulic chuck.

The advantages of all these systems is a 50 percent increase in cutter life due to the more secure, vibration-free grip, guaranteed repeatability when changing like-for-like bars and a simple, fool proof fitting process.

Gewefa offers the hydraulic chuck for

ARNO, System Dieterle, DTS/HOBE/MAS/ Sumitomo/Sandvik/ Simtek and Vargus screw orientation options along with other systems.

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

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

Gewefa UK Ltd

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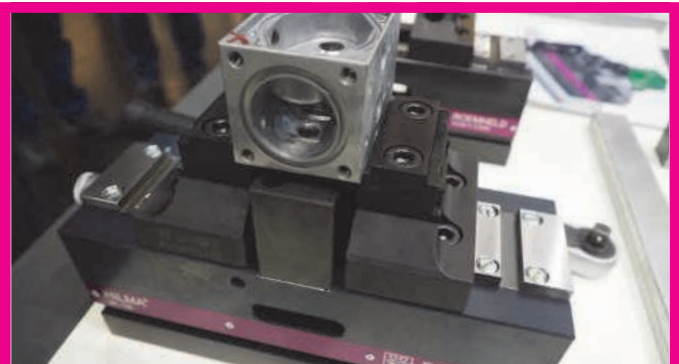
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New intelligent process control software for Renishaw's Equator gauging system

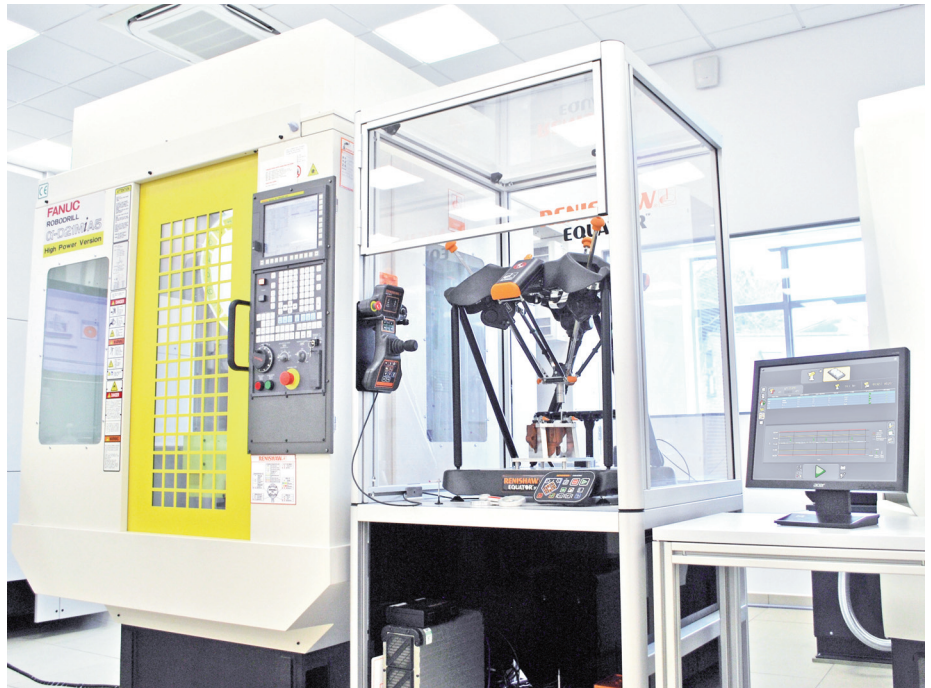
The Renishaw Equator™ flexible gauge is now offered with IPC (Intelligent Process Control) software, providing the functionality to fully automate tool offset updates in CNC manufacturing processes. Improved capability in precision part machining, reduced setting and process adjustment time and integration with automation systems are some of the benefits that users can now expect.

IPC is used with the existing software running on the Equator controller, using recent historical gauging data to determine process corrections. Connection to a compatible machine tool can be as simple as connecting an Ethernet cable from the Equator to a CNC machine. This capability has already been used by Renishaw customers worldwide to achieve considerable performance gains across a wide variety of industries, applications and CNC machine types, including lathes, machining centres and highly automated machining cells.

Controlling processes with frequent gauging

The new IPC software allows constant monitoring and adjustment of a machining operation, keeping part dimensions close to nominal and well within process control limits. This means that any process drift is quickly corrected, improving part quality and manufacturing capability, along with reducing scrap. The proximity of the Equator gauge to the CNC process allows rapid measurement and process adjustment at the point of manufacture, avoiding time delays or relying on finished part (tailgate) inspection.

The IPC software can average results across several parts to determine the true



process mean for adjustment of each cutting tool. For process control purposes, it is usual that only one machined feature per tool offset will require gauging, as compared to many features for typical Quality Assurance (QA) applications. The frequency and control of offset updates can be configured on a feature by feature basis depending on design tolerances, process variation and tool wear rates.

Reduce dependence on skilled operators

The ability to correct a process automatically with IPC software eliminates the potential for manual data entry errors and removes the requirement for an expert to decipher traditional measurement reports into a process correction value at the CNC machine.

requires an Ethernet hub or is via an existing factory network. Closed loop unmanned process control of a cell of machines is possible and a key requirement when used in conjunction with factory automation systems.

Intelligent process control of cutting tools

Options within the IPC software can constantly monitor the process and detect excessive tool offset update values, indicating tool failure or high rates of wear and automatically signal to the machine that the tool needs changing.

Where IPC software is of benefit

IPC software has proven to be particularly useful for conventional CNC lathes or Swiss-style sliding head machines where integration of a conventional machine tool probing system may be difficult due to machine configuration or tool station availability. Using the Equator gauging system is also beneficial where measurement due to feature access or size would be difficult to undertake on the machine tool. Also, the use of off-machine gauging and IPC as a parallel activity is the preferred solution where minimum machining cycle time is a critical requirement.



Update multiple machines from one Equator gauge

An Equator gauging system can be connected to one or multiple CNC machine tools, so that parts from different machines can be gauged on one Equator, with the offset updates being sent to the corresponding machine (part / machine identification is required). Connection to multiple machines

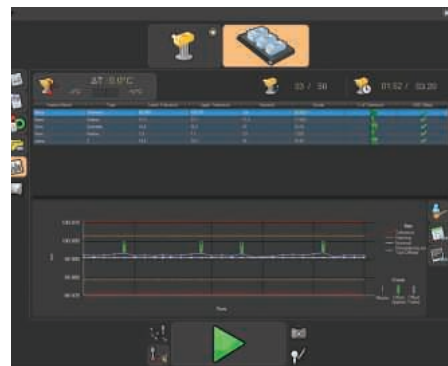
IPC compatibility

The first release of the new IPC software allows connection to one or multiple machine tools, with direct Ethernet links from the Equator controller to FANUC, Mazak and Okuma CNC controls. FANUC controls that have been tested and proven include the 0i, 30i, 31i and 32i, with the Focas2 option installed. Mazak controls currently supported are the Smooth X, Smooth G, Matrix2 and Matrix controls with the Mazak API installed. The Okuma OSP300L and OSP300M controls are supported, on machines with the Thinc API

installed. Future software releases will further increase CNC control compatibility.

The versatile gauge

The Equator gauging system is unique in its design and method of operation, and has already changed the thinking of thousands of production engineers, making it their gauge of choice. The versatility and repeatability that Equator offers is redefining the world of gauging and, now available with IPC software, it offers an even wider range of capabilities to manufacturers globally.



Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare. The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery. It is also a leader in the field of additive manufacturing, also referred to as metal 3D printing, where it is the only UK business

that designs and makes industrial machines which 'print' parts from metal powder.

The Renishaw Group currently has more than 70 offices in 35 countries, with around 4,000 employees worldwide. Around 2,600 people are employed within the UK where the company carries out the majority of its research and development and its manufacturing.

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Electronics manufacturer solves complex PCB inspection challenges with Nikon

Nikon Metrology has recently provided its high-precision, flat-panel based X-ray inspection system, XT V 160 to help Michigan company, Saline Electronics inspect its most complex and challenging technical assemblies to the highest standard.

Saline Electronics, is an electronics contract manufacturer offering comprehensive assembly and manufacturing support for a range of products which incorporate highly-complex, extremely dense circuit board assemblies. Inspection is therefore vital in order to guarantee a product's performance throughout its lifecycle.

To stop the subjectivity of measuring accurate connections in leadless components, Saline Electronics invested in a Nikon XT V 160 with a Varian 1313Dx flat panel detector and X.Tract technology. This new, high-quality PCB inspection system gives technicians a highly-magnified view at component connections for complex PCBAs.

Traditionally the company relied on manual visual inspection, or 2D X-ray systems, to determine whether or not a



connection was acceptable, however due to electronic devices getting smaller and more complex, the problem of inspection to ensure the product is fault free is complex, and these techniques were simply not providing the best inspection method.

The Nikon XT V 160 will expose any hidden features allowing further examination into BGAs and other array style package as well as inspect heels of solder joints, fine pitch packages, and internal characteristics of solder joints. With a proprietary NanoTech 160 kV X-ray spot and electromagnetic lens, the system offers the latest digital imaging technology available and produces clear, sharp images at the micron level.

The system includes the Inspect-X feature

which provides a full, real-time, automated reporting system that details the X-ray system's inspection results and clearly defines passed and failed components with quantifiable data to support those determinations. With a variety of customers in the medical and aerospace industries with Class 3 assembly requirements. The company can now supply these clients with real-time data and 3D visual images that guarantee the solder joints on their assemblies, and therefore the functionality and reliability of the entire PCBA.

Mario Sciberras, Saline Electronics president and CEO comments: "As a future-thinking organisation, we are always investing in the appropriate tools and resources to provide our customers with unparalleled quality. This Nikon X-ray system will better ensure quality for highly-complex circuit board assemblies with leadless components."

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New GLOBAL S CMM offers advanced solutions for enhanced productivity

Hexagon Manufacturing Intelligence has announced the release of the GLOBAL S measuring solution, the first in an Enhanced Productivity Series (EPS) leveraging the Hexagon portfolio of smart technologies, including user experience adaptations, enhanced software and advanced eco-friendly options. The EPS utilises these technologies to simplify tasks related to the creation, execution and analysis of measurement routines. This initiative offers a complete package to the quality engineer, creating the measurement routine, the operator executing the inspection and the quality manager analysing the data that will be used to improve processes in the production workflow. The GLOBAL S is the ideal solution for all operations requiring higher productivity in dimensional inspection, like the automotive, aerospace, general and precision manufacturing industries.

PC-DMIS software enhancements allow common tasks such as the selection of probe tips and the import of files to take place three- to eight-times faster than existing solutions. Further improvements such as feature sensor mapping allow the user to associate sensors to features faster when importing inspection plans. The GLOBAL S with Chrome precision level utilises the coordinate measuring machine's (CMM's) hardware enhancements to offer superior accuracy at the highest scanning speed. Operators benefit from faster scanning measurement of both predefined and non-predefined paths and optimised path trajectories for faster part-program execution. Using the eco-friendly feature, Eco Mode+, there is a 90 percent reduction in compressed air consumption when the machine is in idle state. The CMM solution can save up to 25 percent of compressed air cost under machine standard operating conditions.

GLOBAL S operators will benefit from the new PC-DMIS Inspect option for program selection and execution. This easy-to-use interface within PC-DMIS allows the operator 'one click' measurement routine selection. Automated solutions are also provided, ensuring reliable integrations and efficient data flow management. Messaging

lights and the ergonomic jogbox provide an enhanced operator experience. Machine alerts regarding temperature, humidity, vibrations, and unexpected stoppage are also available via the PULSE monitoring system.

Ingo Lindner, global product line manager, says: "The launch of the GLOBAL S is another step towards the future of smart manufacturing. Utilising our smart quality products, we can now enable advanced data flow management and at-a-glance data visualisation that delivers the robust digital thread that quality managers need to drive productivity and profitability goals."

The GLOBAL S is available via local Hexagon Manufacturing Intelligence commercial operations and dealers.

New advanced GD&T course from Hexagon

A new, two-day advanced PC-DMIS software modular training course, suitable for CAD and CAD++ users, has been launched by Hexagon Manufacturing Intelligence.

The course specifically focuses on the geometrical dimensioning and tolerancing element of the software and is aimed at personnel involved in manufacturing and engineering, design, quality control and process planning.

All GD&T topics are covered with practical examples in class with an emphasis on understanding the report contents, particularly with position dimensions. Students will also learn how to read a drawing and understand the requirement for measurement.

Hexagon's application engineers have devised a new training manual and workbook for the course which is also



suitable for PC-DMIS users who have studied Level One GD&T. More details are available online at www.hexagonmi.com

Thomas York, Hexagon Manufacturing Intelligence's training product specialist, says: "This new course will provide a high level of competence and understanding of our software with respect to all aspects of geometrical dimensioning and tolerancing,"

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

Hexagon Manufacturing Intelligence
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SICK unveils a "snapshot" of the future at Machine Vision Conference

SICK UK revealed standout developments to its machine vision and imaging capabilities at the first UKIVA Machine Vision Conference in April in Milton Keynes. The show was the first time in the UK that vision specialists, system integrators and end-users had an opportunity to experience at first hand, through interactive exhibits, key advances in user-programmability and 'snapshot' 3D Vision as part of SICK's comprehensive 2D and 3D vision portfolio.

The show was a launch pad for SICK's unique new open software platform, SICK AppSpace, which can be used to develop and implement tailor-made application solutions on SICK programmable devices. Hailed as an exciting new "eco-system" for bespoke application development, SICK AppSpace gives users unprecedented flexibility to exploit SICK's growing range of smart vision systems and intelligent sensors.

The new SICK SIM4000 Sensor Integration Machine, a high-performance, one-box, multi-core processor that can integrate multiple cameras and sensors together with powerful image processing.

Inspector P, SICK's first fully user-

programmable range of 2D vision cameras with all the performance and flexibility needed for critical duties in verification, inspection and quality control.

The Visionary 3D camera, which uses "snapshot 3D" camera technology to provide a robust solution for industrial applications which benefit from having 3D data delivered in one shot, for example obstacle recognition, collision warning systems or pallet handling applications.

Neil Sandhu, SICK's national product manager for Imaging, Measurement, Ranging & Systems says: "We are excited about the establishment of the UKIVA Machine Vision Conference and have been proud to work closely with UKIVA in getting this important new industry forum up and running.

"The show is a very timely one for SICK,



because we have a number of ground-breaking new developments to share that open up new opportunities for our customers to develop application specific solutions and to implement them into their machines and systems with ease.

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Large scale measurement hits new precision levels with new MaxSHOT

'Game changer' is the only way to describe the new Creaform MaxSHOT 3D Next that is now available from Measurement Solutions. The UK's metrology specialists has now extended its ability to offer the highest level of measurement accuracy and repeatability on parts from 2 m to 10 m with the arrival of the MaxSHOT 3D.

Destined to change the landscape for product development, manufacturing, quality control and inspection teams that need impeccable precision levels and repeatability up to 10 m, the hand-held MaxSHOT 3D measuring system can be used by inspection and quality control departments for dimensional inspection of parts, as well as product development teams that wish to reverse engineered large products.

The new MaxSHOT 3D is aesthetically and ergonomically designed for ease of use. Within the sophisticated system is guidance technology and user friendly software that makes the new MaxSHOT 3D ideal for users of all levels, even non-metrology experts.

For manufacturers that consistently work on large scale projects, the MaxSHOT 3D

from Measurement Solutions is the first system that gives complete peace of mind. The MaxSHOT 3D gives users the ability to easily measure with an accuracy within 0.015 mm/m, significantly improving process efficiency and measurement consistency.

Renowned for portable, reliable and very easy-to-use metrology equipment, the new MaxSHOT 3D photogrammetric camera and the VXshot processing software from Measurement Solutions stands out from other systems because it is so easy to use. It allows engineers completely new to photogrammetry to quickly and easily generate a high accuracy positioning model of an object based on a series of photos.

Unlike more traditional photogrammetry systems, there are no complicated cameras to handle or manipulate, so you don't need to be a photographic expert. MaxSHOT 3D is designed to make photogrammetry as simple, accurate and error free as possible. This makes the MaxSHOT 3D ideal for smaller jobs such as benchtop measurements, jig and fixture certification and other smaller parts.



The MaxSHOT 3D incorporates new high quality optics that improve accuracy by up to 40 percent, whilst a laser projected frame with a live go/no-go feedback, visually ensures the operator is taking suitable images and measurements, eliminating the potential for error. This works in synergy with software diagnostic tools that suggest corrective actions during the measurement process.

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Autodesk to show new PowerMill CAM software at Advanced Manufacturing

Autodesk will demonstrate the 2018 release of its PowerMill CAM software for high-speed and 5-axis machining for the first time on stand C59 at the Advanced Manufacturing Show to be held at the NEC, Birmingham, from 6th to 8th June. The 2018 version includes a new ribbon-style interface, further development of the turning capabilities introduced in PowerMill 2017 and improvements to 2-, 3- and 5-axis milling.

Demonstrations of the various enhancements can be seen on the Autodesk website at www.autodesk.com/powermill-whats-new

A free trial version of PowerMILL 2018 can be downloaded from the website at www.autodesk.com/products/powermill/free-trial. The download provides 30 days of unlimited use of PowerMill Ultimate, allowing potential users to experiment with all the strategies that the software has to offer. The only limitation is in post-processing. The trial version includes a number of generic 3-axis post-processor files from the comprehensive range

available with PowerMill, but does not allow 5-axis post-processing.

The most obvious change in PowerMill 2018 is the introduction of a modern, ribbon-style interface, making the software more compatible with other Autodesk programs. The new interface offers benefits to both new and experienced users. To speed up and simplify programming, commonly-used commands are grouped together, with both icon and text descriptions to help users to navigate the functions quickly. Pop-up tips also help understanding of purpose of the buttons. Drop-down menus are used to access detailed functionality, so allowing a limited initial presentation of buttons and maximising the screen usage.

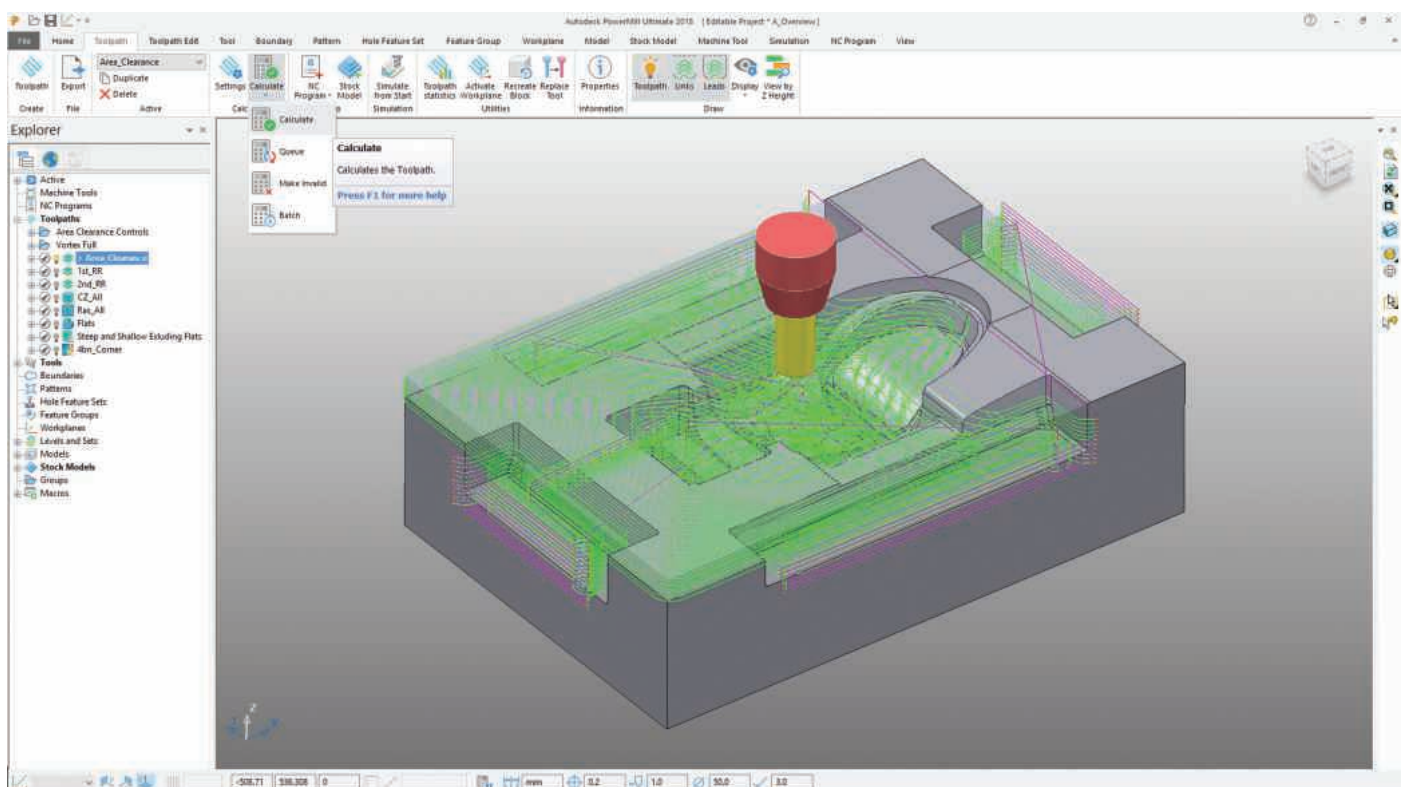
For experienced users, the familiar working zones remain, such as the Explorer window and user menus, so that established programming practices can be maintained. Both the ribbon and the quick-access toolbar can be customised with the ability to add buttons and tabs, then saved as custom configurations for use on other installations.

A new background area has been introduced for various file-management tasks, from opening and saving projects to accessing the various PowerMill options.

PowerMill 2018 sees the introduction of similar editing tools for turning as the software offers for milling. These tools provide additional control over the development of programs for optimum efficiency. The ability now exists to edit leads, links, and start- and end-points for turning toolpaths, giving full control over the approach, engagement and departure from the material. These options allow a better surface finish to be produced, in particular through minimising witness marks.

Toolpath segments can also be edited, with full control over the order of the segments and the direction in which they are machined. All the edits can be achieved without full recalculation of the toolpaths, so reducing overall programming times.

Other options previously available in milling that can now also be used for turning include collision checking for toolholders and the ability to create stock models after



PowerMill 2018 uses a ribbon-style interface to speed up and simplify programming

each operation. The stock models can be used to minimise air cutting and to reduce the possibility of unmachined stock being left on the part.

PowerMill 2018 also includes a number of improvements for companies using 5-axis machines. Using the optimum tool axis in 5-axis machining helps to avoid collisions and allows the use of shorter cutting tools that can produce a better surface finish. The dynamic machine control option within PowerMill 2018 has been improved to give the user greater control over 5-axis motion. Rather than working on an entire toolpath, tool-axis edits can now be made in different regions of the area being machined. This can be done for a single region or for multiple regions, with the option to interpolate between the different axes as the toolpath progresses. The resulting toolpath will only change in the areas that need to be edited, so less time is needed to experiment with different tool-axis settings.

The main enhancement for 3D finishing in PowerMill 2018 is the addition of a centre-line option for 3D Offset Finishing. This option, which can be used in Optimised

Constant-Z and Steep-and-Shallow Finishing, removes the cusps of material that can be left at the centre of the offset. This additional cut removes material that could produce problems in subsequent machining operations or that could need to be smoothed out by hand polishing.

Improvements have also been made for 2D machining. During the calculation of 2D roughing toolpaths, the stock is now updated dynamically, trimming the toolpath segments slice by slice to avoid possible collisions with the model and the remaining stock.

A dedicated finishing strategy for 2D walls and floors has been added, allowing the finish machining of these features to be completed in single or multiple passes, with full control over the ordering of the toolpaths. Also new for 2D finishing is a strategy for rounding that uses routing tools to produce convex fillets. This replicates the workflow used for chamfer machining to produce toolpaths to create these features.

Finally, a number of improvements have been made to the ViewMill simulation module. The results from ViewMill can now

be panned, zoomed and rotated in the various shading modes, allowing quick manipulation of the model and so helping to minimise the possibility of unmachined material being left on the part when producing large and complex parts. During simulations, the tool and toolholder are now dynamically checked against the ViewMill stock so that potential problems can be identified and resolved more quickly. The final simulation image has also seen an improvement in quality, increasing the confidence that all the required material will be removed and that the surface finish will be acceptable.

For further information on PowerMill 2018, contact:

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New B-axis Turning cycle amongst Edgecam's 2017 R2 updates

The latest release of the game-changing Edgecam software introduces a new Turning cycle which includes B-axis movements while machining on a turning centre. This new feature in Edgecam 2017 R2 allows greater accessibility when machining complex profiles, by dynamically positioning the insert.

Edgecam brand manager John Buehler says the toolholder is gouge-protected during deployment and the user can have additional control over the toolpath by deploying over-ride angles: "This new cycle can be used with all types of turning tools, and for both roughing and finishing operations."

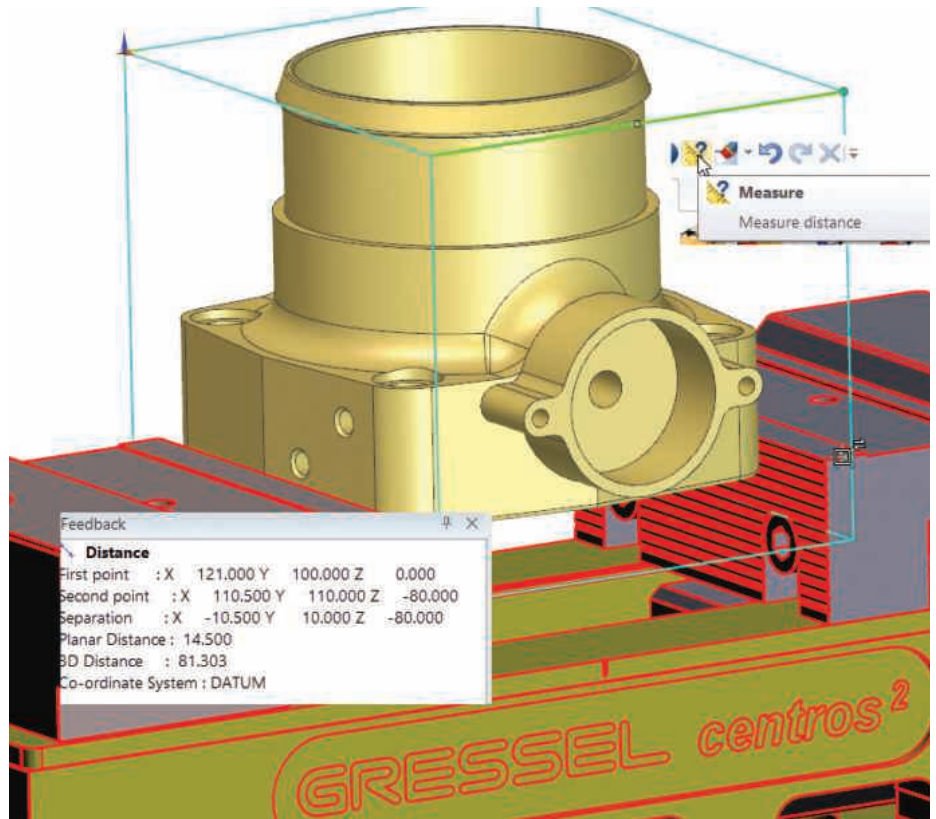
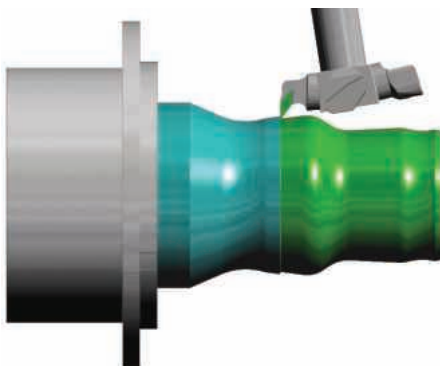
There are around 20 items of new and enhanced functionality in Edgecam 2017 R2, from the Vero Software stable, covering turning, milling, simulation, and wire EDM.

Amongst the updates, when using the Fixture Database it is now possible to measure fixtures and other workholding devices.

"It's essential to be able to accurately measure the exact position and size of the fixture, as well as clarifying its relationship to components, stock and any other workholders," explains John Buehler.

Regarding Feature Finding, information transmitted by CadLink has been enhanced where 'Limits and Fit' data is now passed to the Edgecam feature. This support covers CREO, SolidWorks and Inventor files. As well as showing the characteristic of the feature, this information also empowers strategy manager authors to capture and use the data when creating machining routines.

The Live Job Reports function was previously run as a Windows service.



Edgecam 2017 R2 swaps it to a desktop application, improving reliability when altering user profiles.

"With so many software tools available in Edgecam, it can sometimes be difficult to judge which commands to permanently fix on the interface, but the latest release overcomes this with a new Quick Search function," says John Buehler. "Less common functionality can be easily located and deployed by simply searching the command library."

The 2017 R2 release continues Edgecam's evolution of updating cycle dialogs with pictures and context sensitive help.

"In this instance, Slot Milling, Project Flow Curves and Project Circular Pattern cycles have all been updated. This feature not only assists regular users to easily interpret infrequently used commands but it also aids less familiar users to quickly understand fundamental functionality."

The Inspection Module offers what John Buehler describes as "unparalleled ease of use and sophisticated probe path generation" for both in-process and end-item part inspection. "It provides a

robust environment for on-machine probing, supporting a wide array of feature types, path creation and report generation."

Responding to the growing need for offline inspection and probing, Edgecam caters for CAM programmers and utilises CAD models. Using a set of easy-to-use commands, the user creates a set of inspection features which are then converted into a toolpath and simulated. This means the machine code macros are created via Edgecam's postprocessor.

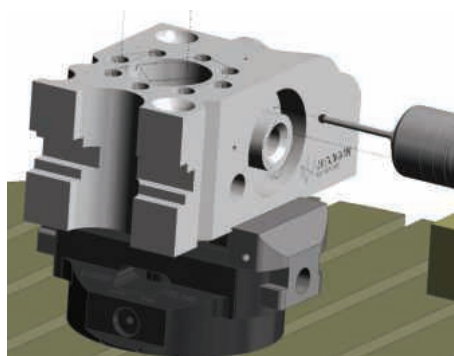
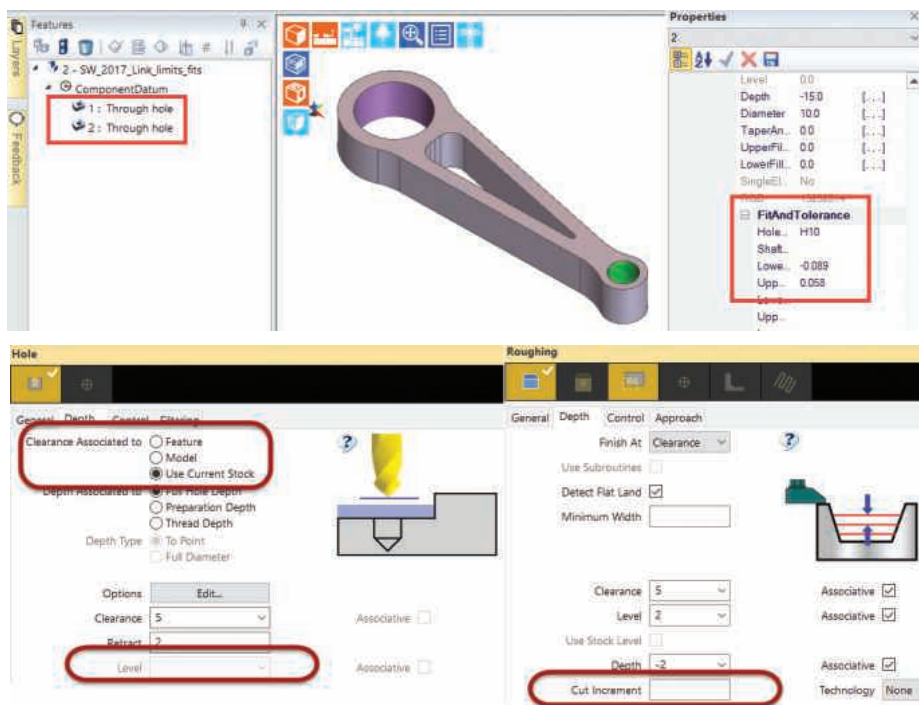
The Machine Simulator benefits from two additional enhancements. The ability to pick the target component while using View Comparison was introduced in the previous release, and has now been enhanced so that users can now opt for 'All components', especially useful when working with numerous parts on a multi-loaded fixture. Secondly, a quicker, more convenient way of rewinding the toolpaths has been introduced when exiting Machine Simulator. Rather than use the traditional menu option, users can now simply hold down the 'Shift' key.

Both the Roughing and Hole Drill cycles

have been upgraded to be more consistent with existing functionality. When roughing to full depth, users no longer need to state a 'cut increment' value. In previous releases, it was necessary to provide a figure.

Similar to the Roughing cycle, when set to 'Use Current Stock', the 2017 R2 Hole cycle no longer requires a Z Level value. The system automatically detects the start position for the toolpath.

Finally for Wire EDM users, numerous enhancements have been made to the Machine Configurator. Support for multiple versions of EDM Expert is now available and a new technology setting has been added, allowing cycles to automatically switch to



the appropriate EDM Expert technology page.

The ACVision and Excetek postprocessors now have more options, giving greater user control. Finally, the Tagging functions now allow a non-parallel movement when exiting a machining path.

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www.edgcam.com

CGTech announces UK launch of VERICUT Force

CGTech, the developer of VERICUT® CNC Simulation, Verification and Optimisation software, is set to officially launch its latest "physics-based" toolpath optimisation module, VERICUT Force™, in the UK with a series of nationwide seminars.

The Force Roadshow will be a series of half day seminars throughout June and July, kicking off at the Advanced Forming Research Centre, Scotland, on 14th June 2017. A further three seminars will take place at KYOCERA Precision Tools, Wokingham (28th June), Nikken, Rotherham (4th July) and the Manufacturing Technology Centre, Coventry (6th July). For further information and to register, visit: www.cgtech.com/forceroadshow

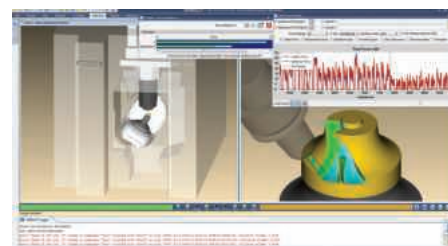
The Force module is a physics-based optimisation method that determines the maximum reliable feed rate for a given cutting condition based on four factors: force on the cutter; spindle power; maximum chip thickness; maximum allowable feed rate. It calculates ideal feed rates by analysing tool geometry and parameters, material properties of the stock

and cutting tool, detailed cutting edge geometry, and VERICUT cut-by-cut contact conditions.

In this latest version, VERICUT 8.0.3, numerous enhancements have been added to Force, including new features for better control of entry/exit speeds, 'clean-up' feed rates, while tooling information has been re-arranged to be more intuitive. The updated Force module now receives input values directly from cloud-based tooling and benefits from many new features that streamline optimisation setup. By micro analysing the cutting conditions encountered by an NC Program, Force ensures NC programs have optimal feed rates, and ideal chip thicknesses that do not exceed safe force or power limits.

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

Force excels in difficult-to-machine



materials and especially complex multi-axis cuts such as 5-axis flank milling. CGTech Ltd managing director, Tony Shrewsbury comments "Force is based on the basics, it is easy to set up and really easy to use."

After materials have been characterised, they can also be applied to a broad range of cutters and machines in other NC machining operation. Initial users of this technology are already seeing productivity improvements of up to 50 percent. Each seminar will incorporate live software demonstrations and presentations to shine the spotlight on the features and benefits of Force.

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CNF MAXXimises performance with hyperMILL

Recognised as a high-end manufacturer of medium to high volume CNC machined components, CNF Precision Engineering has recently purchased two sets of hyperMILL CAM software from OPEN MIND Technologies to support its two new Matsuura 5-axis machining centres. The new machines were strategically purchased for prototype and development work with the aim of taking new prototype customers through the pipeline to longer term high volume production business.

The arrival of the 32 pallet Matsuura MAM72-35V in 2015 and the recent arrival of the MX520 identified the need to upgrade existing CAM software to a more capable solution. Unfortunately, a leading CAM supplier that had provided software to Aylesbury-based CNF for over a decade could no longer meet the demands of the company. Doing extensive research and conducting numerous trials, the company soon arrived at the conclusion that hyperMILL from OPEN MIND was the most comprehensive solution.

As a company operating 24 hours a day and seven days a week with a workload that is 75 percent volume production and 25 percent prototype and small run work for the aerospace, medical, scientific, electronics and automotive sectors with parts primarily machined from steel, stainless and aluminium, the benefits of hyperMILL have been staggering.

Neil Fearnley, CNF Precision's managing director, says: "We looked at upgrading our software with the previous CAM supplier, but licensing issues, costs and limited 5-axis cycles made us investigate CAM packages more extensively. It was one of the best things we've done as a business; hyperMILL has been outstanding for our business. During the demo and early implementation



stages, we quickly recognised that hyperMILL allowed us to easily manipulate tool paths and extract geometries. It was faster to program through its comprehensive 5-axis and purpose built cycles and the collision avoidance is outstanding. We also recognised that the technical support was excellent and as a new user with an 'around the clock' production environment, this was very reassuring."

CNF bought its first hyperMILL seat in October 2015 and a second seat followed just before Christmas, in time for the delivery of the new Matsuura MX520. Ramping up its programming capabilities, CNF now has two complete seats of hyperMILL with three programmers. The productivity, capability and turnover at CNF have all grown considerably with its ongoing investment in new multi-pallet machine tools.

Demonstrating the recent growth at the company and how hyperMILL has contributed, production manager Mark Baron says: "I used to spend 25 hours a week programming 2-4 complex jobs each week. Using hyperMILL, I now spend a similar amount of time programming, but I get through up to 10 programs a week. As a department, we can program over 30 complex jobs a week. This would have been impossible without hyperMILL. When we initially started with hyperMILL, our programming times were instantly 20-30 percent faster. This is now more like 60 percent and, as we continually become more proficient with the strategies, we'll get even faster programming times."

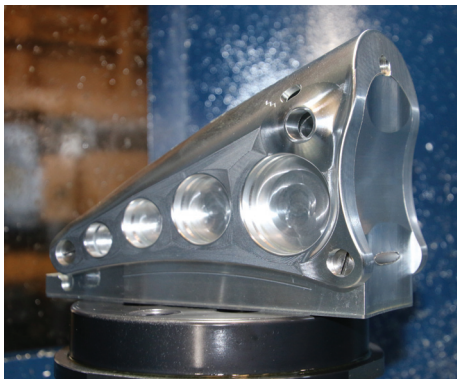
Strategies for success

The improved programming times have been attributed to strategies such as 3D arbitrary stock roughing that has reduced programming times for roughing operations from 1-2 hours to less than 20 minutes in most instances. The ability to manipulate tool step-over with this cycle has also reduced machining times by 20-30 percent. Additionally, the 3D chamfer cycle recognises the shape of the part and contours the component with a chamfer tool with complete collision avoidance and this has also drastically reduced programming times when finishing parts.

MAXXimum cost reductions with roughing strategy

The roughing module of the hyperMILL MAXX Machining performance package has been well publicised for its potential savings and CNF can certainly testify to the benefits. CNF has a throughput from 3,500 to 6,000 milled parts each month and over 50 percent of these components require rough machining. It's here that roughing strategies of hyperMILL MAXX Machining are making a huge difference.

Mark Baron says: "We used to use a lot of indexable cutting tools such as 20 mm diameter end mills, but the depth of cut and percentage step-over are both limited by the insert dimensions. We've applied the roughing strategy with solid carbide end mills and we can run the tool at a 20 percent step over rate with a full flute depth of cut that is often 50 to 80 mm. The material removal rate is absolutely staggering.



Added to this, we used to run our indexable tools at an 800 mm/min feed rate, but we are now running at 4 to 6 m/min with solid carbide tools. That is up to seven times faster in many instances."

The result is that roughing cycles on steels and hard materials have been slashed by 80 to 90 percent, reducing overall cycle times and improving productivity by an average of 40-60 percent on many components. Despite the massive increase in material removal rates, CNF is witnessing huge tool life savings by moving to solid carbide tools and the innovative roughing strategies of the hyperMILL MAXX Machining power

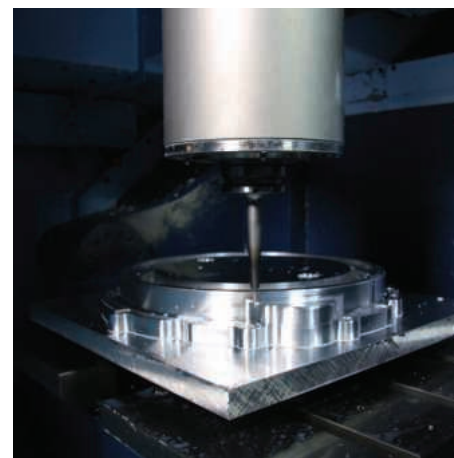


package. Many of the solid carbide end mills from ITC are retained in the tool carousels of the multi-pallet Matsuura's for anything from three to 12 months.

Mark Baron continues: "Our tool life has increased by 100 to 140 percent since implementing solid carbide tools with 5-axis machining strategies. On the contrary to common thinking that harder and faster machining would increase the load on the machines, our spindle load has reduced significantly. We have moved from small depth of cut machining at 18,000 rpm with indexable tools to 8,000 to 10,000 rpm spindle speeds with full depth machining. This has seen the spindle load fall by over 20 percent as we are running at the optimal torque levels."

Machining parts of such high complexity on high-end machine tools like CNF's two 15 pallet H-Plus300 Matsuura machining centres and the 32 pallet MAM72-35V, collision detection and avoidance is a necessity.

Mark Baron concludes: "The Matsuura machines and hyperMILL work in perfect synergy, so we have a complete model of the machine tools within hyperMILL. By



having the trunnion tables, workholding jigs and fixtures, spindle, tools, probes and tool holders all set up in hyperMILL, we have complete confidence in the comprehensive collision avoidance system."

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Hainbuch introduces on-line CAD modelling for customers

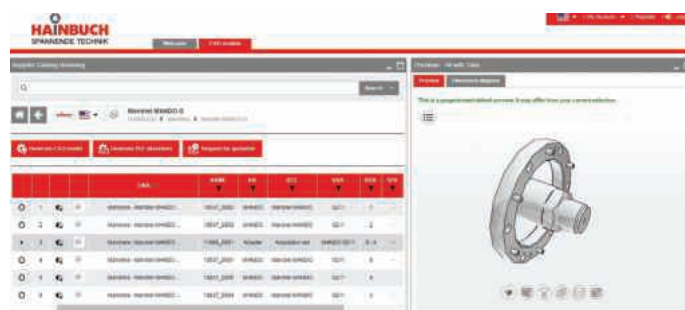
To streamline the project planning and purchasing of workholding equipment, Hainbuch has now developed an on-line CAD package where customers can build their own customised workholding solution.

The Hainbuch CAD models are available for customers to build via the Hainbuch website **www.hainbuch.partcommunity.com**. On the portal, customers can create bespoke Hainbuch clamping systems and build the most efficient workholding device for their exact needs.

Taking this ingenious system a step further, the Hainbuch facility also allows customers to download the CAD file from the Hainbuch website and model a complete fixture with components and the machine tool in the CAD system used by the customer. By importing Hainbuch models and putting components into chucks and workholding devices on internal CAD systems, end users can visualise and calculate machining strategies and potential issues before even placing an order.

Having the ability to measure parameters such as the clearance and kinematics of the machine tool as well as having the tools to visualise potential for errors and collisions with spindles and toolholding equipment prior to purchase will generate huge savings for Hainbuch customers.

Commenting upon this new development from the workholding specialists, Hainbuch UK managing director, Nick Peter says: "Our staff spend considerable time walking customers through the process of building their specific solution. With the new on-line



system, we can talk customers through the process via the website whilst giving a visual indication of the solution. More experienced engineers can competently build their own solution. The new PARTcommunity portal will provide an on-line quoting service that will streamline and speed up the process for both end users and internal staff. We are often asked to generate CAD models for machine tool builders; with the new CAD package machine tool builders can build a suitable workholding solution with their prospective customers."

To build your own bespoke workholding solution, visit the **www.hainbuch.partcommunity.com** website or contact:

Hainbuch UK

Tel: 01543 278731

Email: nick.peter@hainbuch.co.uk

www.hainbuch.com

Sir Patrick Stewart boldly goes into the metrology future

The man who piloted the Starship Enterprise is given a glimpse of the scientific future at the University of Huddersfield

Famous actor Sir Patrick Stewart, who played Jean-Luc Picard in Star Trek: The Next Generation on TV and film, is Emeritus Chancellor at the University. On his latest visit, he worked closely with young actors and film studies students, but was also shown some of the scientific and technological research taking place.

He visited the University's Future Metrology Hub, a £30 million research centre that will help transform UK industry by developing sensors embedded into machinery, leading to huge increases in accuracy during the advanced manufacturing process.

The Hub, heavily backed by the Engineering and Physical Sciences Research Council (EPSRC), is based in the University's Centre for Precision Technologies, home to a team of world-renowned researchers in precision engineering and metrology.

On his visit, Sir Patrick met the Hub's director Professor Xiangqian Jiang and Senior Lecturer Dr Haydn Martin, plus its multi-disciplinary, multi-national team of researchers who are harnessing new developments in metrology and miniaturisation.

Professor Liam Blunt showed Sir Patrick how metrology and X-ray analysis were aiding the development of new, patient-specific medical devices, and could also be used for purposes such as investigating and verifying artifacts including antique weaponry.

The Future Metrology Hub is led by the University of Huddersfield, building on the achievements of its EPSRC Centre for Innovative Manufacturing in Advanced Metrology. The universities of Sheffield, Loughborough and Bath provide



complementary expertise and support, as does the National Physical Laboratory (NPL) from its bases at Teddington and Huddersfield. The Hub will address major, long-term challenges facing UK manufacturing industries.

A large team of industrial partners, including famous companies from a wide variety of industrial sectors, are providing funding and support to the Hub. More than £30 million has so far been pledged across the consortium, and new partners will be sought as the research progresses.

As part of the Government's commitment to supporting world-leading manufacturing research in the UK, the Huddersfield research centre receives a major investment of £10 million from the Engineering and Physical Sciences Research Council (EPSRC) and is one of six new Future Manufacturing Research Hubs.

The University of Huddersfield is an inspiring, innovative provider of higher education of international renown. It has a national reputation in enterprise and innovation and has been the recipient of the Times Higher Education's University of the Year Award and Entrepreneurial University of the Year as well as a Queen's Awards for Enterprise. In the 2015, the University was

recognised with 5 star status by international ratings organisation QS Stars for teaching, internationalisation, employability and for facilities and access.

The University annually welcomes 22,000 students to a range of undergraduate and postgraduate programmes across subjects covering: the sciences, engineering and IT; health, education and the social sciences; business, management, law and accountancy; architecture, design, humanities and the arts.

The University of Huddersfield's researchers are dedicated to solving the problems and answering the questions posed by industry, science and society as a whole. Its pioneering research is showcased by internationally-recognised centres of excellence, strategic industry relationships and a commitment to providing state-of-the-art facilities and equipment.

The Chancellor of the University is His Royal Highness the Duke of York, KG, and the Vice-Chancellor is Professor Bob Cryan CBE.

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123 Insight releases v10.04 of its multi award-winning MRP/ERP system

123 Insight Ltd has announced the release of v10.04 of its 123 Insight MRP/ERP software, which includes several new features covering commercial, finance, planning and stores, as well as various performance enhancements.

Users now have greater visibility of items within the commercial section of the software, such as who raised a purchase order or outstanding quotes within specific search screens. In Finance, improvements have been made to purchase invoice matching and new sales invoice reports have been added. Both Planning and Stores sections also benefit from enhancements including data filtering and a redesign of the parts enquiries screen.

Various 'under the hood' performance enhancements have also been applied. Several of the core SQL database search queries have been optimised, resulting in a significant speed improvement when mining large datasets. Key search grids allow

filtering to be applied before data is displayed, ensuring that users only see relevant results and the system only searches and displays filtered information rather than all data.

Managing director, Guy Amoroso says: "This release is primarily based on feedback from customers who have benefited from enhancements in previous v10 releases and provided us with ideas on how we can further extend that functionality. Little things, such as adding in more information to search results grids, avoid users having to navigate into an individual record which, over the course of time, has a cumulative benefit and makes the system easier and more enjoyable to use. Our larger users will also benefit from the performance enhancements and will be able to quickly get to the information they need."

The update is available free of charge for all 123 Insight users as part of the standard monthly subscription. Users can download



and install it themselves or can request a remote upgrade for £295.

In March 123 Insight picked up its 31st award, winning the IT Europa 'SME Solution of the Year' award.

Founded in 2000, 123 Insight provides an award-winning end-to-end solution that is suitable for virtually any manufacturing environment, including EMS, (Electronic Manufacturing Services) aerospace, marine, automotive, medical, food, textiles, electronics and oil. It has options for CRM, service and repair, e-commerce and integration/interfaces into all major accounting systems.

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The advertisement features a background image of industrial components, including a large metal flange and a smaller pipe fitting. Overlaid on this are several circular icons representing different software features: a hand using a barcode scanner for 'Batch Traceability & Part Issue Control', a hand writing on a document for 'Customer Relationship Management (CRM)', a calculator for 'Sales EDI', and a warehouse for 'MRP / Scheduling'. The 'vero' logo is in the top right corner. The 'javelin' logo is prominently displayed in the bottom right, with the tagline 'Production planning & control software'. Contact information is provided at the bottom: 'Tel: 0116 272 5700 | Web: www.javelin-mrp.com'. The 'PART OF HEXAGON' logo is in the bottom left corner.

Integration of cutting processes in the supply chain

Lantek has the answer

Following the radical change in how sheet metal companies compete with the advent of technological advances, globalisation, increased complexity and ever shorter lead times, companies in the industry are fully aware of the need to link all their production processes together so that they can integrate with their supply chain. Integrating any process into a supply chain, whether within the same company or among multiple companies, depends on two fundamental factors:

Alignment

The common vision and objective for the entire chain. This ensures consistency throughout the entire supply chain, whether within one company or among several cooperating companies.

Connection

This refers to the communication and the information both for planning and for decision-making, which ensures that the necessary data is available and is consistent and reliable.

For sheet metal cutting processes, this means companies must be capable of aligning their production systems with the general objectives, connecting them and gathering the information needed to make specific decisions on component manufacture while considering the priorities of the supply chain as a whole.

In a typical integration delivered by Lantek, information is collected from the ERP system on manufacturing orders and operations routing. CAD data, product information and delivery dates are then collated and the sheet metal manufacturing technology is applied choosing the best production routes and methods based on the physical characteristics of the part, its material and thickness.

By including these features, Lantek can optimally combine designs, business objectives, and production priorities for the most efficient use of a company's sheet metal machinery resources. These can be very sensitive to poor planning, especially given the extra complications encountered



during parts nesting. Once manufacture is complete, the results are reported to the ERP system in a format which it can use. With this direct communication, it is possible for the data to be connected coherently with data from other processes involved in the supply chain, enabling the generation of data analytics including reports such as material utilisation and machine performance.

By integrating a specialised tool for the production of sheet metal parts that works jointly with a financial and business-focused-ERP, Lantek's dedicated sheet metal solution provides a series of advantages that generic solutions cannot offer.

Lantek signs partnership agreement with laser manufacturer Nukon

Lantek has signed a partnership agreement with Turkish fibre laser manufacturer Nukon to supply Lantek software with its machines worldwide.

Nukon's range of fibre laser machines is available in power levels up to 6 kW and has an option for linear drives which gives acceleration of up to 3 G. The laser itself is fully sealed and includes automated dynamic focus, delivering very significant speed and cost savings when compared to a CO₂ laser.

As well as its fibre laser cutting machines the company also manufactures tube cutting fibre lasers, and waterjet, plasma and

oxygen cutting machines. Over 500 machines have already been installed and Nukon uses its own manufacturing facility in Turkey as a test bed and showcase for its machines, enabling it to deliver reliability, productivity and ease of use to its customers.

Following the agreement with Lantek, Nukon customers will be able to benefit from the extensive network of offices and skilled distribution channels that Lantek has around the world. By drawing on Lantek's local knowledge and experience in the sheet metal industry, customers will be able to optimise their processes and get the maximum return on their investment in machinery and software.

As well as Lantek Expert CAD/CAM software, which enables manufacturers to work from 3D models to a finished product, the company's Lantek Factory concept will enable users of the Nukon machines to develop manufacturing systems that will manage the complete production process and provide a path to Industry 4.0 implementation.

Francisco Pérez, OEM channel director for Lantek, says: "Collaborating with Nukon will enable us to bring our software, skills and local knowledge to a wider customer base and will help Nukon by giving it support in international markets and an opportunity to offer its customers a business solution which can grow to match commercial needs."

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US Naval research lab enhances R&D capabilities

Concept Laser's 3D metal printing technology has been selected for rapid prototyping and materials research by the U.S. Naval Research Laboratory.

The U.S. Naval Research Laboratory (NRL) is the Navy's full-spectrum corporate laboratory, conducting a broad-based program of scientific research and development for maritime application related to oceanic, atmospheric, and space sciences.

Dr. Charles Rohde, NRL acoustics division, says: "We require a wide range of Additive Manufacturing (AM) capabilities, ranging from quality monitoring to process parameter development and need an architecture conducive to that research and development effort."

NRL will be using Concept Laser's M2 cusing machine to print in stainless steel. Along with the machine, it will be using QM Meltpool 3D to monitor the quality of their metal applications, inspecting the part as it grows. This will also help it to identify any design defects and if an application is on the edge of acceptability. Additionally, they will



be using CL WRX Parameter 2.0 to freely design and develop custom parameters.

President and CEO of Concept Laser Inc, John Murray says: "It is very exciting that the U.S. Naval Research Laboratory is bolstering their focus on metal additive manufacturing. There are so many advantages of 3D metal printing that our defense strategy could benefit from, including reduced lead time, less material waste, and printing complex geometries with no required assembly. NRL has a history of over 90 years of innovation in naval power and we look forward to hear

how they will use 3D metal printing to break boundaries."

Additive manufacturing involves taking digital designs from computer aided design (CAD) software, and laying horizontal cross-sections to manufacture the part. Additive components are typically lighter and more durable than traditional forged parts because they require less welding and machining. Because additive parts are essentially "grown" from the ground up, they generate far less scrap material. Freed of traditional manufacturing restrictions, additive manufacturing dramatically expands the design possibilities for engineers.

Concept Laser is one of the world's leading providers of technology to support the 3D printing of metal components.

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Light years ahead

New range of laser texturing machines from GF Machining Solutions

GF Machining Solutions has expanded its line of laser texturing machines with the introduction of its compact Laser P 400 3-axis and Laser P 400U 5-axis models.

The machines have been designed to provide manufacturers with straightforward and repeatable laser engraving and texturing of small, often complex parts, such as cutting tools, small inserts and micro-machined components.

The Laser P 400 machine accommodates workpieces up to 600 mm x 400 mm x 250 mm, while the P 400U (5-axis) accommodates workpieces with a maximum diameter and height of 120 mm. The modular design of the machines features a dual-laser head that includes both a ytterbium pulsed (nanosecond) fibre laser and a ultra-short femtosecond pulsed laser.

This allows texturing and engraving of a surface with a single setup, and extends the range of materials that can be machined - steel, aluminium, carbide, brass, copper, ceramic etc. With the femtosecond laser

glass, sapphire and polymers can also be engraved.

The machines are automation-ready to allow for unattended and lights-out operations thereby further increasing their versatility and productivity potential, and can be equipped with a System 3R pallet changer to further boost process efficiency and manufacturing flexibility.

Martin Spencer, managing director of GF Machining Solutions UK, says: "The Laser 400 series of machines provide manufacturers with a fully-digitised process that makes it easy to texture, mark, engrave and add functional textures to parts, moulds, mould inserts etc.

"The incorporation of Femtosecond laser technology opens up new possibilities for creating aesthetic nano textures that include 'ripple' effects, as well as enabling burr free engravings and textures to be produced.

"Achieving high accuracy and high quality textures in one setup and without the need for or expense associated with post-



The Laser 400 series of machines provide manufacturers with a fully-digitised process that makes it easy to texture, mark, engrave and add functional textures to parts, moulds and mould inserts

treatment operations like deburring provides manufacturers with a high-productivity and cost-efficient solution."

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Innovative technology cuts sawing costs

Last month KASTO, the sawing and storage systems specialists, hosted a three-day Open House event at its UK headquarters in Milton Keynes. New bandsaws were introduced to the UK market for the first time providing users with impressive performance benefits. The KASTOwin pro AC 5.6 is a high performance, economically priced bandsaw, offering short cutting times, long blade life and intuitive operation. The bandsaw can significantly increase production speed and efficiency. Depending on the type of blade and the material being cut, processing times can routinely be reduced by up to 50 percent and more in some instances.

Andrew Wright, sales and business development manager, says: "Blade life is very important and we like to optimise the speed and the feed."

KASTOmicut is a new range of swing-frame, pivoting-bow bandsaws for use in workshops. The versatile machines are designed for high accuracy cutting to length and mitre cutting of tubes, sections and solid materials. Four model variants are available. The saws supersede six machine models in the KASTOpractical and KASTOfunctional series, compared with which they have higher power motors and greater band tension, allowing a 50 percent increase in cutting force. Feed rate is constant throughout, avoiding lost productivity due to the blade slowing towards the centre of the cut. Blade speed is

infinitely variable from 20 to 120 m/min, allowing a range of different materials to be processed cost-effectively.

KASTO prides itself on doing things right. A key aspect of this philosophy is service and the company has a high availability of spare parts. In the UK, it holds more than 10,000 parts covering the majority of first-line spares, available for collection or delivery next day. Service like this ensures KASTO has excellent, on-going relationships with its loyal customer base. In fact, 53 percent of its customer relationships have existed for more than ten years. Andrew Wright confirms: "Most of our customers are customers we know, repeat customers."

Energy efficiency? Yes, but not at any cost

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

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

so that in-house production is economical. Finding a happy medium is a difficult task for many.

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

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

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

Pragmatic developments

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

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

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

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



Modern drive technology uses energy intelligently

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

All drives are controlled by intelligent converter technology. KASTO has fitted the frequency converter with a DC link (as used in its automated material storage systems) so that excess energy, generated when braking the saw motor for example, can be recovered and used elsewhere in the system. In contrast, conventional technology disperses this energy via braking resistance, so it is lost as heat.

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

Rapid payback

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



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

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Kerf cuts a bright future for Scottish steel working company

Evolving from a small blacksmiths to a 1.5 acre site, John Thorburn & Sons Ltd has grown beyond recognition during its 70 year history. The family run business that specialises in the construction, agriculture and commercial steel-working sectors has always invested in the latest technology to underpin its continuous growth. This investment has now seen the Scottish company invest in an UltraSharp plasma cutting machine from Rochdale-based Kerf Developments.

Employing over 50 staff and operating a variety of turning and milling centres as well as punching, pressing, fabricating and guillotine equipment, the modern-day business primarily manufactures, fabricates and erects agricultural buildings and structures. To manufacture the numerous components that constitute a complete steel building structure, John Thorburn relied upon its guillotine, punching, steel working and fabricating equipment until the arrival of a Kerf RUR2500 plasma cutting machine.

Commenting on why the company bought the Kerf RUR2500, managing director and grandson of company founder John Thorburn Snr, John Thorburn says: "We recognised that our method of cropping, punching and drilling plates was cumbersome, time consuming and slowing down our throughput. All our jobs had to be handled and re-worked on a variety of different machines to arrive at a finished



part. Additionally, we had to stock a large range of steel bar widths and thicknesses and this was taking a lot of floor space. Kerf has instantly eliminated all of these issues."

John Thorburn & Sons investigated the various options and it arrived at the conclusion that Kerf Developments had the most suitable solution for its needs. The Berwickshire business specified the RUR2500 with a 6 m by 2 m bed, so it could comfortably fit 4 m by 2 m by 20 mm thick plate on the machine. This bed capacity enables the company to use the nesting facility on the Kerf machine to cut up to 50 stanchion base plates in a single setup.

Raising the bar on profitability

The stanchion base plates that are required in considerable batches for the assembly of agricultural buildings were previously cut from 400 mm by 20 mm thick steel bar that was 6,400 mm long. By purchasing 4 m by 2 m by 20 mm thick plates instead of bar, the company instantly reduced material costs by over 30 percent. In fact, John Thorburn has

calculated the change from bar to plate has taken stanchion material costs from £15 to less than £10 per unit. Furthermore, the nesting software supplied with the RUR2500 machine enables the company to set up a plate and instantly cut a batch of parts, further maximising material utilisation and reducing costs.

Taking the setting up and nesting process a stage further, the 6 m bed enables John Thorburn & Sons to set up a range of plate sizes, meaning a complete inventory of parts for a project can be processed in a single setup. The 275 amp machine is powered by the Lincoln Electric Spirit plasma unit and, by utilising Kerf's Ultrasharp technology, the customer can cut profiles, holes and slots with impeccable precision levels and edge finishes.

The ability of the Ultrasharp system to cut precision holes from the 20 mm thick steel plates has cut cycle times on the end plates the company produces for steel building rafters. A batch of plates that would take 3 days to produce can now be made on the Kerf machine in a few hours.

As well as achieving the desired impact on production times and throughput, the company has also been making savings on its gas consumption. John Thorburn continues: "We were using high volumes of oxygen and acetylene for manual fabrication work. This cost of £600 per month has been eliminated and whilst the Kerf plasma has consumable costs, they are nominal compared to what we were spending previously."

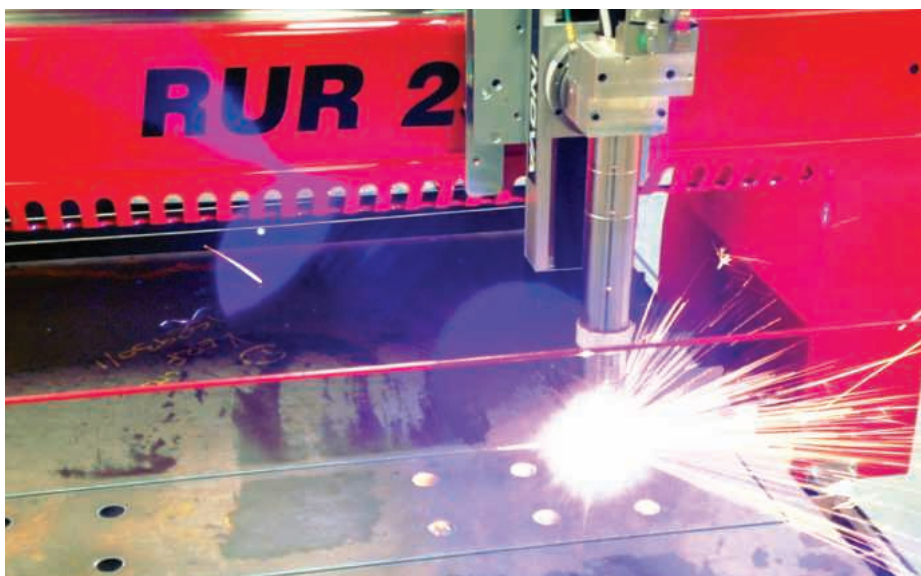
As a result of acquiring the Kerf UltraSharp plasma machine, John Thorburn & Sons has streamlined production, reduced steel stockholding, freed machine tool and labour capacity and also reduced material and consumable costs. As a result of releasing this extra capacity, the company has now started offering subcontract cutting services as well as targeting a wider variety of work in its core market segments.

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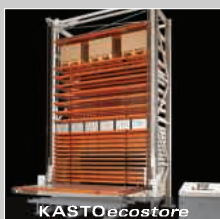
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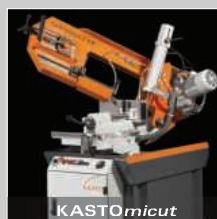
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Based on Bahco's renowned 3860TMC unset carbide blade, the TC range is now available at highly competitive prices. Its multi-chip design, producing seven chips from a four tooth pattern, maximises cutting performance and blade durability within niche applications.

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3860 TCA: a blade with a rake angle of 12 degrees, designed for maximum efficiency



when cutting aluminium, including large blocks; ideal for foundries using automated cutting technology

3860 TCZ: with zero degree rake angle, this blade is specially made for cutting chromed induction hardened bars or graphite; also suitable for cutting non-metallic materials which do not produce chips

3860 TCT: with a ten degree angle, this blade has been designed to open up new markets for unset carbide, at competitive prices; suitable for the same applications as TMC blades but with finer TPI's. It can also be used in the triple set type 3868 and the multi-set type 3881.

Bahco's high technology bandsaw blade

manufacturing centre in South Yorkshire produces both Set Tooth and Unset Tooth carbide blades.

The key product differences are:

Set tooth: the carbide tooth tip is the same width as the band; the cutting clearance is created by setting the tooth.

During production the carbide tooth is formed from a carbide ball, ground to create both chamfered and un-chamfered tooth tips of different heights. The finished ground teeth are set to give cutting clearance.

Unset tooth: the tooth is wider than the bandsaw material; the wider tooth tip creates its own cutting clearance.

During production the carbide tooth tip is formed from a carbide cylinder, ground to form tooth tips with different heights and differing amounts of chamfer.

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Nuclear options

Nuclear Advanced Manufacturing Research Centre chooses Prosaw accuracy

The Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) is a collaboration of academic and industrial partners from across the civil nuclear manufacturing supply chain, with the mission of helping UK manufacturers win work at home and worldwide.

The Nuclear AMRC brings together the experience and resources of industry leaders with the expertise and innovation of leading universities. It is owned by the University of Sheffield and is part of its world-leading advanced manufacturing innovation cluster alongside the AMRC with Boeing, Castings Technology International and AMRC Training Centre, all of which are based at the Advanced Manufacturing Park in Rotherham, South Yorkshire.

All requirements for sawing at the facility were originally undertaken by subcontractors, but this route was eventually considered to be too time consuming as well as being an expensive option. It was therefore decided that the



most effective solution to all the possible requirements for sawing would be to acquire an in-house sawing facility.

Although usage would be almost exclusively focussed towards research, testing, maintenance or producing samples, often in small batches, it was recognised that any new sawing facility would need to be capable of processing what are termed "exotic" materials and to a high degree of accuracy.

After assessing a variety of different

sawing systems from five independent suppliers, Prosaw were identified as the company most capable of delivering a cost effective and optimum system suitable for the needs of all possible applications.

A WH-6056HA twin column bandsaw was selected as the most advantageous solution and was duly installed by Prosaw engineers.

Maintenance manager Craig Hamp comments: "Most of the usage of the saw is intermittent as it is normally used for either cutting small batches or one-offs, so whereas volumetric throughput is not normally a prerequisite, accuracy undoubtedly is" adding "this machine certainly fulfils that requirement, regardless of whether it is used for sawing components for maintenance purposes, testing, research, or producing samples."

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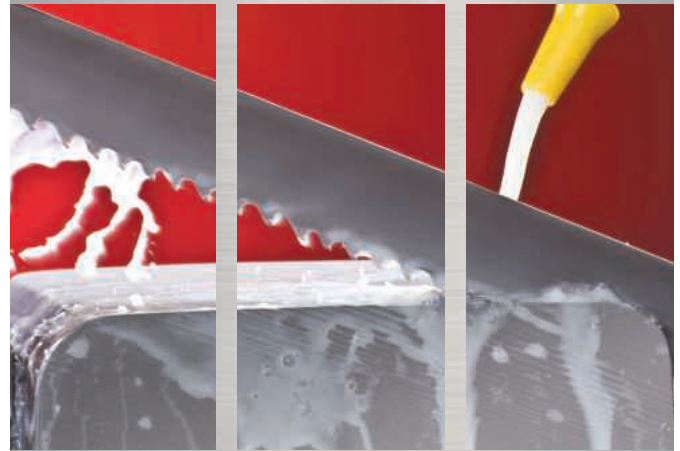
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Sights on the future with automated sawing-processing plants

By Simon Smith, Behringer Ltd

There is a lot to be said for the use of fully automated plant systems for processing and handling steel sections in the steel trade. The parts being handled here are extremely bulky, the risk of potential accidents is high and the frequency of errors should not be underestimated. Networked plants and integrated logistics can be invaluable for steel stockholders.

Automated operations in the steel trade require minimal low numbers of employees to control and monitor a machining process which involves only minimal direct contact between personnel and material or machines, from the goods-in department through to loading the finished parts onto trucks for shipping. Different tasks from materials management through machining and order picking to shipment are all performed according to a programmed sequence and logical material flow process. A driveway along the hall wall permits part delivery and storage.

Without encountering any interrupted flow, the steel products and profiles are delivered straight to the warehouse, and travel from there to sawing machines on infeed roller conveyors. High-performance sawing plants in the centre of the hall, such as the Behringer HBP510-923G-NAP automatic straight and mitre cutting saws cut the material. Some parts then pass through a surface treatment line, while others are loaded immediately following sawing.

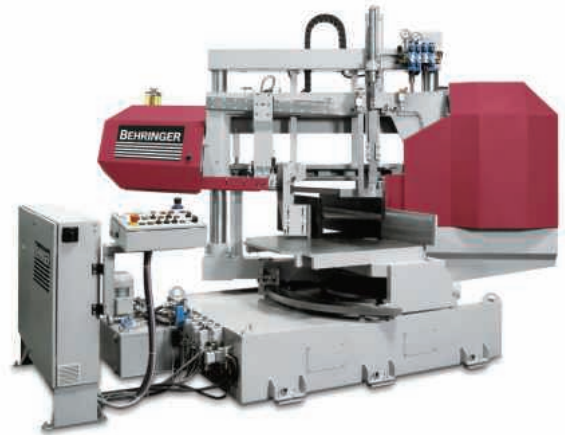
Processing takes place on a program-controlled, bar-optimised basis. A transport management system ensures the material-saving assignment of starting lengths by matching them up to orders, and takes care of trouble-free material flow along the plant. The material and data arrive at the right time in the right place, enabling maximum output. Alongside the sawing

machines, Behringer GmbH supplies all the peripherals from its own in-house steel works.

Features which guarantee optimum process reliability and a low frequency of errors are to be found not only in the machines themselves but also in the plant's ideally coordinated control system. The robust, torsionally rigid design of the Behringer mitre bandsaw incorporate saw blade guiding components made of vibration-damping grey cast iron, which extends the service life of tools and is the optimum choice for fully automated multiple shift operation.

From the warehouse, the raw parts are transferred using a hall crane onto the cross conveyor of the sawing line, where they are separated and fed towards the machine using an infeed roller conveyor with positioning device. Following on from the sawing process, the cut sections are sorted into cross conveyors in two directions. An output gripper automatically selects the trim pieces and offcuts. Short lengths are also sorted onto table surfaces and possibly also into containers. Depending on the material size and weight, different versions of the transport systems are used. In many cases, one particular variant might be the preferred option, for instance taking into account past user experience. Depending on the job in hand, good parts are deposited in the order picking zone for delivery, or are sent automatically for surface treatment to the blasting or painting booth. Markings and labels on the parts simplify the process of assigning parts for commissioning, or enable information to be scanned in.

All material movements are controlled from the central control desk. However, each sawing line has its own PC-based control system, from which the data is sent collectively to the higher-level control desk. The machines themselves have only a control system with functions for servicing, repair and maintenance. Here, mobile operator panels are used which can be docked onto different locations along the complete plant.



Alongside process reliability, employee safety, throughput speed and the prevention of errors all have a role to play



As safety takes top priority, all fully automated plants are surrounded by a protective fence and light barriers, although connecting steps and raised control centre stations ensure an optimum overview of the entire process.

"By automating material flows and in particular due to the automated cut section disposal system, heavy and hazardous work processes are minimised", says Behringer CEO, Christian Behringer.

Investing in networked plants is the future, also in view of the demographic changes currently taking place.

Importantly too, future developments in the industry such as the interlinking of different machines mean that Behringer GmbH is on the right track with its networked systems.

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Sheet metal subcontractor opens with Bystronic equipment

Combining the engineering expertise of company directors Ian Hazlehurst and Russ Canner, a new and expanding specialist manufacturing centre and sheet metal subcontractor, Proform Group has opened on the Wirral, Merseyside.

Through his own subcontracting firm, Machfab Engineering, established in 2004, Ian Hazlehurst has an extensive background in traditional precision engineering. He recently joined forces with Russ Canner, a business entrepreneur, as they identified a gap in the local market for a full-service firm able to provide a full range of services including sheet metal cutting, bending, fabricating and even powder coating.

With the assistance of a regional growth fund grant, Proform has invested over £2.5 million in extensive premises and purchasing some of the highest specification machinery available on the market today. The company has committed to creating 28 jobs in its first year of business and hopes to continue to expand on this year on year.

A turnover of £1.2 million is expected in the first year of trading, which the directors hope to double by the end of the fifth year. These figures are based on Proform's current capacity, which comprises a fibre laser cutting machine, two press brakes and a twin-head, 3D waterjet cutting machine, all supplied by Bystronic UK. The equipment is installed in a 22,000 sq ft facility in Prenton, a suburb of Birkenhead that is also home to the Tranmere Rovers football stadium.

Additionally, the subcontractor has installed MIG and TIG welding bays and bought a nitrogen generation plant to supply the fibre laser machine and another in the future. This cutting gas, which is expensive to buy, provides a high quality cut edge. Oxygen will be used only on sheet over 6 mm thick and when cutting copper.



Ian Hazlehurst (right) with Russ Canner, proprietors of Proform Group, at the company's new premises on the Wirral peninsula. They are standing by the Bystronic ByStar Fiber 4020 automated fibre laser cutting centre, which together with other machines on site is powered by solar panels on the factory roof, with the surplus electricity sold back to the National Grid

By mid-2017, a powder coating plant will be installed to augment the wet spray painting service offered, bringing the total investment in the venture to £3.3 million.

Ian Hazlehurst says: "We polled over 30 of Machfab's customers and found that they were spending £1.5 million on buying in laser cutting services, so we reasoned that we could win a proportion of that.

"Another consideration was that we believe that there are just two sheet metal subcontractors in the Liverpool area and they cannot provide the full range of machining services. The next nearest providers are in Manchester and North Wales.

"It was also apparent that the general standard of service provided could be improved upon. Through experience at Machfab of buying in laser cutting services,

we noticed that quality was sometimes suspect and turnaround times were often much longer than promised.

"These were the factors that prompted Russ and me to set up Proform. It is our intention to be a serious contender and take the subcontract sheet metalworking market in the North West by storm."

An important facet of the company is that it offers an all-encompassing design and manufacturing service, which was the rationale for investing in laser cutting, water jetting and folding from the outset. It is also the reason for opting to buy Bystronic equipment, as it was the only manufacturer able to supply all three types of machine, which are built in Switzerland at the company's factory in Niederörs.

An added bonus is that all equipment uses the same production planning and control software, BySoft 7. It means that programs can be generated from a CAD model to drive the three different types of Bystronic machine, so components can be transferred easily from one to another with little production downtime.

The software incorporates IGEMS, which generates toolpaths over 3D models for machining with the two CNC heads on the waterjet cutting machine. The ByJet Flex has a 6 m by 3 m bed, making it the only machine of its type and size in the North of England. All other Bystronic machines of this



The two Bystronic press brakes in use at Proform's factory

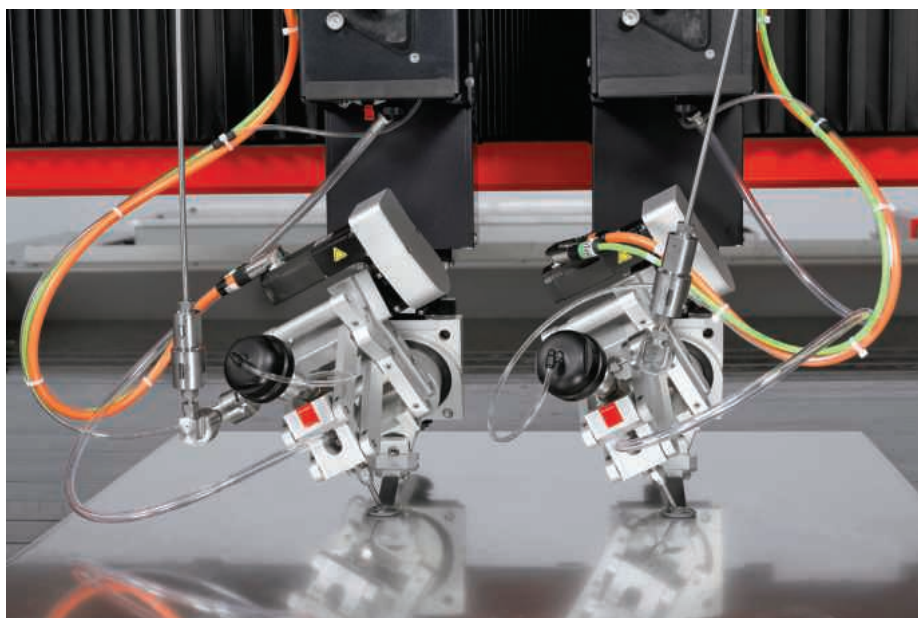
size and specification are in the south. Any material up to 30 cm thick can be cut to very high accuracy.

The ByStar Fiber laser cutting centre also has generous capacity at 4 m by 2 m, rather than the normal 3 m by 1.5 m, and was the first machine of this size to be delivered by Bystronic into the UK market. Its 6 kW fibre laser source can cut 25 mm thick mild steel and 30 mm stainless steel and aluminium, as well as 15 mm copper and 12 mm brass.

The machine has been equipped with a ByTrans sheet handling system capable of delivering material automatically to the machine's shuttle table and subsequently retrieving the processed sheet. Apart from eliminating arduous manual sheet handling, it has the potential to boost output considerably, as it can be stocked with up to six tonnes of material to allow unattended production overnight.

The press braking function at the Prenton factory is the remit of an Xpert 250 tonne machine capable of bending components up to 4.1 m long and an Xpert 40, the supplier's smallest model, of 40 tonnes/1 m capacity. Around half of the output from the laser cutting centre is folded on these two machines.

Ian Hazlehurst explains that an integral feature of the larger CNC press brake is the large depth of the backgauge, which maximises the range of parts that can be produced. He also appreciates the LED lights along the upper beam that show where the bending tools should be placed



The ByJet Flex waterjet cutting machine at Prenton is equipped with two 3D heads, raising the productivity potential for complex parts

for any particular job, as well as the cameras at either side of the machine verifying that the correct punch and die have been selected. The result of these safety measures is that damage to tooling is avoided and scrap is eliminated.

Highlights of the Xpert 40 are its user friendliness and sheer speed when bending parts up to one metre, particularly of the CNC backgauge fingers. The 25 mm/s stroke is two and a half times faster than on the Xpert 250, the tooling is interchangeable and power consumption is low.



The Xpert 250 press brake, rated at 250 tonnes, is capable of bending parts up to 4.1 metres



The 40-tonne Xpert press brake is very fast when bending parts up to its maximum capacity of one metre

This also goes for the fibre laser cutting machine, which draws about one-third of the electricity consumed by a CO₂ laser.

Ian Hazlehurst anticipates that the fibre machine will generate two-thirds of the company's turnover. It is up to three times faster than a CO₂ equivalent, especially on thinner gauges, and is able to cut a wider range of materials without risk of damage to the optics.

Proform held an Open Day on 21st April 2017 to open the new Prenton premises officially and launch the company's services. Lee Hazlehurst, a keen Tranmere Rovers supporter, persuaded the club's chairman, Mark Palios, to officiate alongside the Mayor of Wirral, Councillor Pat Hackett.

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

Staffordshire-based Weldall (Cannock) Ltd is a provider of architectural fabrication services. The company decided to replace its ageing Haco punch press with a new Yawei Nisshinbo HPE punch press, the first of its kind in the UK. Its Haco was being driven by a CAM system which was cumbersome to use and had no automation features such as tool teach or nesting.

Operations director Ryan Blower says: "Automatic tooling was basically non-existent. With the old system you had to tell it exactly what to do."

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

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

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

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

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

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

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

In the two years since implementation, the company has seen an increase in turnover/profitability in line with an ambitious business plan. Ryan Blower explains that this is due to the increased capacity that the combination of the machine and software has delivered. With plans for a second machine within 12-18

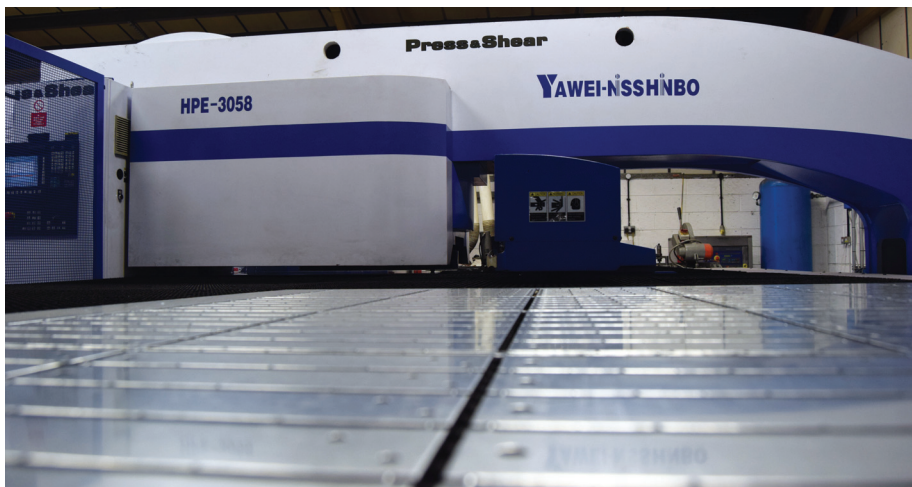


months, Weldall also plans to upgrade JETCAM to include automatic nesting with the capability to go from CAD file through to optimised nests and NC code within seconds.

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

Highlights include: ROI of just 6 months, based on staff time alone; Tool teach allows complex tooling to be learnt and replicated automatically; programming time halved; bump nesting allows for quick drag and drop nest creation; Advanced Reports Designer allows for detailed FMS report; full upgrade path to complete automation; software recommended by machine vendor; new features seen through updates via maintenance; fully trained in a day.

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The dawn of a new era in the processing of heavy steel plate

The new technologically advanced Tipo G31 gantry CNC Machining Centre from FICEP offers the perfect solution for the drilling, milling, marking, scribing, tapping, chamfering and cutting of heavy steel plates up to 100 mm thick and 3,100 mm in width.

The Tipo G31 system is one of the most productive and versatile machines currently available for manufacturers of heavy structural steelwork, agricultural, earth moving and mining equipment who are looking to maximise productivity, minimise production costs and increase accuracy when processing large heavy steel plate. It can be equipped with dual spindles with independent sub axis which increase the productivity over single spindle lines by approximately 40 percent.

The dual spindles can drill, mill and scribe simultaneously even if the holes are not in line, with up to 24 tools available for each spindle.

The Tipo G31 features a double bridge structure with the spindle or spindles located within the two bridges to maximise spindle guidance and rigidity.



The hold down clamp firmly secures the plate, avoiding any vibrations that could compromise the part quality, accuracy and tool life. Once the material clamp is engaged, the sub-axis of the Tipo G31 produces all drilling, scribing or milling operations within the clamping window. This eliminates the need to clamp and unclamp and reposition the material in the length direction for each spindle's operation.

In addition to the drilling heads, the Tipo G31 can be equipped with two plasma

torches (straight or bevel) and up to three oxycutting torches. There is also an option to extend both the infeed and outfeed tables to process plates up to 40 ft in length.

The integration of an automatic part unloading system makes the Tipo G31 ideal for small to medium size parts.

FICEP UK

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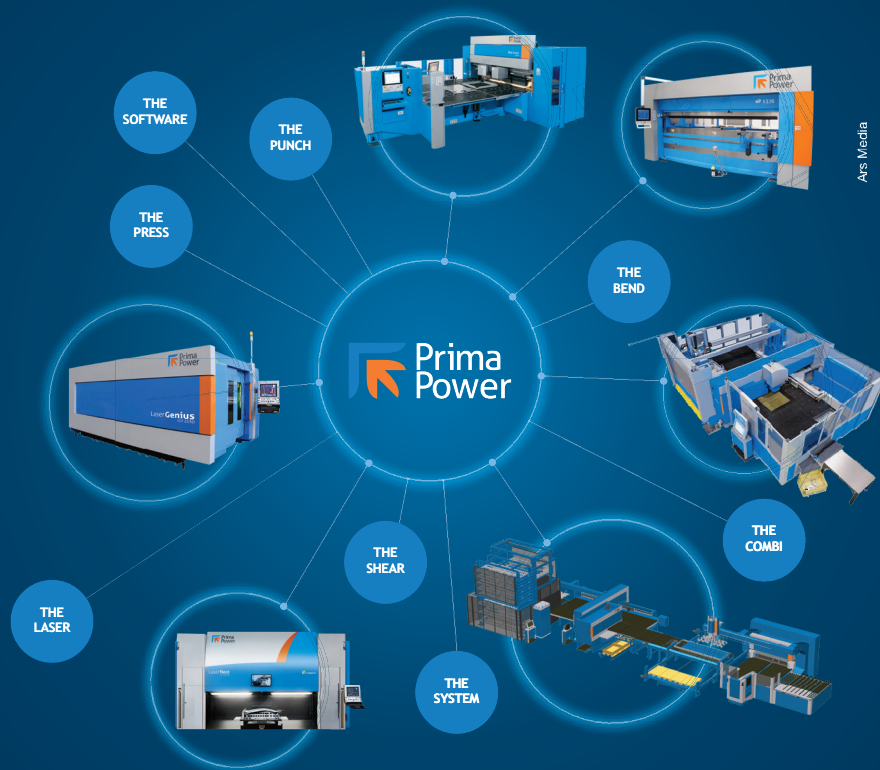
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Pressing news



Established in 1850, Baker & Finnemore Ltd, also known as 'Bakfin', has survived the test of time and grown to become one of the UK's premier pressings manufacturers, recognised globally for the exceptionally high level of quality it offers in the Starlock® push on fastener range, as well as other bespoke pressings.

Based in Birmingham, Bakfin began life manufacturing fountain pen nibs as its main product line and was at one time the sixth largest producer of pen nibs worldwide. However in the late 19th century along came the ball point pen and the need to diversify. Bakfin went on to begin producing a whole range of different pressings mostly on fly-presses. Its success at satisfying specific customer demands helped to quickly establish it as a world class manufacturer, making a huge variety of different pressings for many different applications.

Fast forward to 2016 and Bakfin is still world-renowned as the original manufacturer of the Starlock push on fastener, selling almost 500 million globally each year. The original range and many more variations have been developed

alongside customers to satisfy specific demands for their applications and assembly processes.

Part of the Titgemeyer Group of companies since 2012, Bakfin continues to push for future success and has invested substantially to ensure that it is using the most cutting edge technologies for every process.

At the factory, still located in Newall Street, Birmingham, Bakfin boasts in-house facilities, including a tool room, press shop, heat treatment plant, scour / deburr and finishing facilities. Keeping all of these processes in house, enables absolute quality control which is evident in the company's extensive portfolio of accreditation to automotive, aerospace and defence standards as well as environmental and health & safety (ISO9001, TS16949, AS9100, ISO14001, OHSAS18001).

Bakfin has carefully researched the changing demands within the industries it serves and recognised the need for modern and advanced press machinery. Larger Starlocks and more complicated components that push the limitations of pressed component manufacture are increasingly required for an array of complex customer applications and fastening needs.

Bakfin responded in kind to this demand by investing in a Minster/Nidec P2H-100 series press. This machine boasts a much larger press bed and increased tonnage, both key requirements for larger more complicated and modern progression



tooling. The infinite adjustable stroke provides ultimate flexibility and the cast iron frame along with the oil film technology results in consistent parts accuracy and extended tool life for the entire lifetime of the machine. Bakfin can now meet the demand in the market by both producing larger more modern tooling and running it on advanced press technology. This in turn means that the high demands of customers of both Starlocks and bespoke pressings can be met competitively, whilst maintaining the expected high level of quality.

This exciting new piece of investment has already sparked interest from some of Bakfin's longest standing customers, with a queue of new business already forming in advance of the presses commissioning. Bakfin is delighted by the opportunities this investment brings for itself and its customers and recently hosted an Open Day to show off this new technology and also the rest of its facility located in the Jewellery Quarter, Birmingham.

The event, held on 18th May, included a complimentary breakfast, networking, talks from the owners and CEO of the Titgemeyer Group and the managing director of Baker & Finnemore, along with support staff from Nidec Minster Press Technologies, that were present to provide details regarding metal forming solutions from high speed through to high tonnage equipment and all ancillary equipment to support today's press working environment. The event concluded with a tour of the facility.

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Press & Shear adds automated production lines

Tamworth-based Press & Shear has concluded a sole agency agreement with Dutch machinery manufacturer WEMO covering sales and service of its sheet metalworking production lines in the UK and Ireland.

Manufactured in the Netherlands, the modular equipment includes punching, bending and joining lines fed with sheet metal coil, mostly designed and built to customer order although standard products are produced as well. Welding, clinching, cutting and other operations can be incorporated to suit a user's needs.

The automated lines, which also encompass versions for processing blanks and pre-coated material, are intended for high volume manufacturing applications in the electrical, storage, building, automotive and domestic appliance industries. Many types of material from high tensile steel to very thin aluminium can be accommodated.

WEMO (www.wemomachines.com/en/home) recently celebrated its 50th anniversary and currently has a worldwide installed base of production plant valued at



A typical WEMO sheet metalworking production line

€270 million. One of its strengths is the maintenance support and web-based fault analysis it offers 24/7 from its headquarters and factory in Hertogenbosch.

Mark Britton, managing director of Press & Shear comments: "We are delighted to be able to extend our product portfolio with very high quality equipment that complements our existing agency ranges so well.

"OEMs are the main target for these lines, which are ideal for minimally-manned, large series manufacturing applications. However, it is increasingly apparent that the latest

WEMO plant is sufficiently flexible in operation to address the needs of the subcontract sector and we are keen to explore this possibility in the UK and Ireland."

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Oscillating laser beam boosts cutting accuracy

SCANLAB GmbH has developed a scanning system for oscillating-laser-beam cutting and welding. The new welDYNA scan head unites the advantages of higher laser powers and maximum dynamics. Considerable process benefits are gained by welding and cutting with high-frequency beam oscillation, particularly in macro material processing of larger components. For example, thick metal sheets and fibre-reinforced plastics can be cut more quickly and cleanly. Diverse materials of poor weldability can also be robustly bonded.

A substance-to-substance bond between different materials, for example, between copper and aluminium, offers an alternative to mechanical joining, for numerous automotive industry applications, particularly in the electro-mobility segment.

Advantages include improved electrical conductivity, more homogenous heat transfer and higher mechanical strength. Fabrication of devices and fittings likewise often calls for pressure-tight bonding of the same or dissimilar material types, for

example, in heat exchangers or cooling units. This is precisely where the new welDYNA 2D scan system shines. Overlapping laser beam motions relative to the seam geometry enable tear-resistant welds of diverse materials, even for joining partners with poor weldability.

This technology also already has proven merits for laser beam cutting. High-dynamics beam oscillation allows much faster cutting speeds, along with improved cutting quality. Key factors are the high 'wobble motion' frequencies of several kHz and the availability of freely definable scan patterns. Together, they deliver far superior process parameters compared to other laser methods. Applications show considerably reduced splatter formation, making weld seams and cut edges clearly smoother while also slowing down optics wear.

The new scan head is designed for multi-kW lasers of high beam quality and features digital servo control, an integrated sensor system for real-time monitoring, and water and air cooling in a robust,



industrially-suitable housing. It can be easily integrated or installed with collimation and focusing modules of commercial fixed optics. Particularly in sectors such as aerospace or mechanical engineering and metal processing, where thick metal parts and composite materials must be cut, this new scan solution opens up countless interesting new application possibilities.

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