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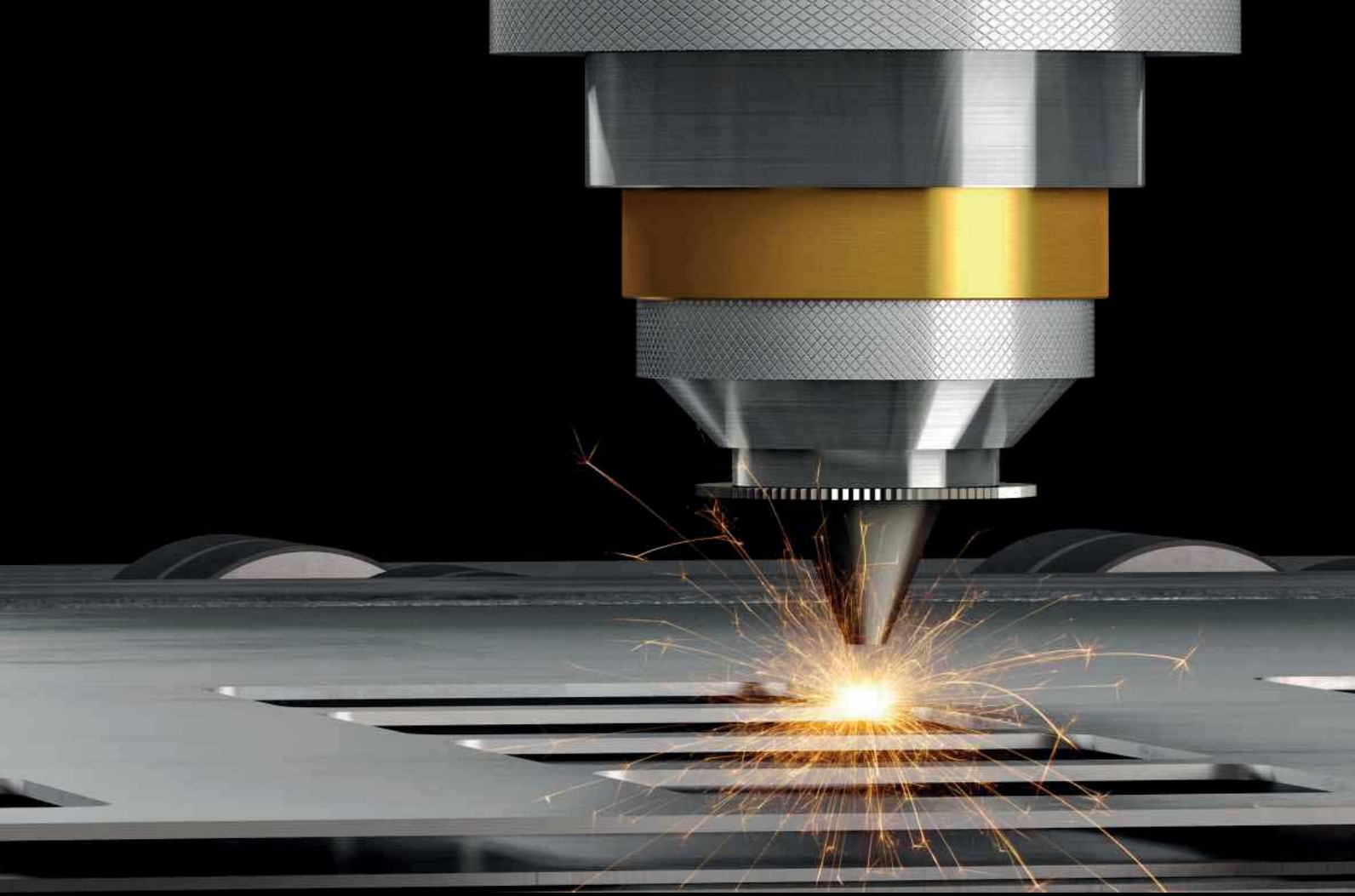


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**NEXT ISSUE MAY 2020**

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# Best of British

Yamazaki Mazak is showing its commitment to the best of British manufacturing with the launch of the new, fully simultaneous 5-axis CV5-500 machining centre, which has been entirely conceived, developed and built in the UK.

Mazak has continually invested in its R&D and production facilities at its European manufacturing facility in Worcester, enabling the machine tool manufacturer to remain at the forefront of the UK machine tool industry.

The new CV5-500 is the latest example of the company's commitment to UK manufacturing and the development of machines specifically for the European market. With a highly competitive price point, the CV5-500 offers subcontractors, start-ups and job shops the ability to easily incorporate 5-axis machining into their manufacturing operations.



"As a company, we pride ourselves on our UK R&D and manufacturing capabilities, which have produced some of the most iconic and popular machine tools currently being used by the UK's subcontracting base," says Alan Mucklow, managing director UK & Ireland Sales & Service Division at Yamazaki Mazak. "When we spoke to customers, it was clear that there is a gap for a fully simultaneous 5-axis machine available at a competitive price point, but with no compromise on Mazak build standards or productivity. This new machine resets the bar for the compact 5-axis machining category and delivers a new benchmark for both British and European machine tools."

An example of pioneering British design, the CV5-500 is unique in its machining category for featuring a high-rigidity bridge that is fully supported by a trunnion table travelling in the Y-axis direction underneath it, delivering a highly accurate and extremely compact machining solution. Further innovations include the machining centre's newly designed overhang headstock, which maintains machining rigidity even at the full extent of the Z-axis stroke.

It also features a new versatile 12,000 rpm spindle, capable of a peak performance of 18.5 kW and 119.4 Nm, making the CV5-500 highly suitable for a wide range of materials, and also easily automated with a side-loading door and robot interface. It is equipped with SmoothX CNC, Mazak's specialist 5-axis version of its SMOOTH Technology.

"Our philosophy has always been to grow with our customers, supporting them through the transition from simpler 2-axis work into more complex machining operations, such as fully simultaneous 5-axis," says Alan Mucklow. "When you partner with Mazak you not only access a range of machines for every conceivable application, but also a partner capable of supporting you through each developmental phase."

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# How Dugard is keeping things fresh in 2020

With new partnerships and new machines, there's a lot on the menu for Dugard.

Dugard has been around for 80 years but is still associated with cutting-edge solutions. How, after almost a century, has Dugard managed to remain at the forefront of the CNC machining industry and what's next?

Today, Dugard is one of the largest exporters of CNC machines from the UK to Europe, boasting a strong agency network with some of Europe's most respected suppliers. As the exclusive UK supplier for Kitamura, Hanwha, Chevalier, Tos Varnsdorf, Honour, SMEC, and most recently Ibarma, Dugard showrooms are the place to be for the latest in CNC machining technology.

However, Dugard started from humble roots. Beginning life in 1939 as a used machine tools shop and subcontractor, Dugard, named after its founder Charles Dugard, has been family-owned and run since the beginning.

Managing director Eric Dugard credits some of the company's meteoric success to those modest beginnings: "Dugard is a mix of contradictions that somehow just work. As one of the UK's oldest sources of CNC machine tools, we have the wide range and expert technical support that comes with a large, successful manufacturer, but because of where we started, we still believe in that personal touch. Our customers are more

than just numbers to us - they're people we've built fantastic working relationships with."

Dugard's sales managers are based all over the UK, offering the wealth of Dugard's 80 years of machining experience to ensure customers are completely supported. According to Eric Dugard it's about more than just the diversity of experience of the Dugard range: "We're lucky to have a sales team with a high level of skill and knowledge of not just Dugard, but of the machine industry in general," he says. "Part of staying innovative is knowing the industry inside-out."

So what's next for Dugard? Knowing the industry inside-out is how, according to Eric, Dugard partners with the best manufacturers the industry has to offer.

Most recently, the company announced new partnerships with popular multinational manufacturers Ibarma and Japanese machinery giant Kitamura.

Ibarma is well-known worldwide for some of the best machine tools on the market. Exporting to five continents around the globe, Ibarma's prestigious range has historically only been available to UK companies via imports.



"Companies in the UK will now have the opportunity to use Ibarma's technology with the best local service support available," says Ignacio Mera, Ibarma's UK area sales manager, speaking about the UK-first partnership with Dugard.

Meanwhile, the Kitamura range, world-renowned for its diverse choice of high-specification precision machining centres, is also now available in the UK exclusively through Dugard. With Kitamura's cutting-edge Mycenter HXiG and HXiTGA Series, along with the industry-leading Kitamura double column Bridgecenter machining centres, Dugard's offering is an ample one.

Kitamura and Ibarma are both right at home in the Dugard range, which often feels like a Who's Who of innovation in machining. The Dugard family of machines is a large one, spanning both new and used machines, with answers for every sector, size and budget.

"Our customers come in all sectors and sizes," says Eric Dugard. "From small businesses and subcontractors to international OEMs, no Dugard customer is the same. That's why we choose to partner with manufacturers with ranges that are as diverse as our customers."



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# Fully integrated Surf-Finishing, fine cleaning and packaging

## High cleanliness requirements perfectly met within the prescribed cycle times

For a renowned manufacturer of various throttle valves and exhaust flaps, Rösler developed a complete, fully automatic, integrated processing system. It includes a workpiece transfer unit from different machining centres, the Surf-Finishing and fine cleaning process itself, the application of a data matrix code, packaging of the finished workpieces in small load carriers (KLT's) and their transfer to stacking cells.

Klubert + Schmidt GmbH, located in Pottenstein, Bavaria, develops, manufactures and markets highly complex throttle and flue gas damping systems for all kinds of on- and off-road as well as marine and industrial applications. The company also produces sophisticated single components and assemblies for leading manufacturers in the field of hydraulics.

Challenging requirements regarding surface finishing and component cleanliness

During a capacity expansion project for the CNC machining of precision components, like insertable housings for the control of exhaust gases, the company also invested in a combined solution for deburring and fine cleaning of the workpieces.

Klubert + Schmidt purchases the raw parts as castings from two suppliers. In this context, the integrated production system must ensure that no part mix-ups occur. After machining, the exhaust gas control housings may contain small internal burrs, which must be completely removed. The subsequent cleaning process must ensure



With the help of a chain link conveyor and workpiece specific carriers the components are staged for transfer to the washing/cleaning system. There they are undergoing a washing as well as a drying cycle. This ensures that the cleaning process consistently fulfils the stringent cleanliness requirements



The overall system includes deburring, fine cleaning, quality control, packaging in small load carriers (KLT's) and their transfer to stacking cells

that the components meet the most stringent cleanliness requirements.

## Fully integrated, linked processes with robotic workpiece handling

For the Surf-Finishing operation, a highly specialised mass finishing process, a robot picks up the machined housings from a transport belt. Prior to the deburring process, the workpieces undergo a rough cleaning step with compressed air. Subsequently, they are placed into the loading stations, where they are automatically mounted to specially developed workpiece fixtures. These allow the clamping of multiple components onto each spindle of the Surf-Finisher. A partial protection of certain workpiece surface areas during the finishing process is not required.

The deburring operation takes place with non-chipping ceramic media. The high speed of the rotating work bowl with the resulting high pressure between media and workpieces not only results in relatively short deburring times but also ensures the removal of all burrs on difficult-to-reach internal contours. To prevent corrosion of the workpieces, the mass finishing compound contains a water-based additive that provides a temporary corrosion protection.

After the workpieces have been removed from the workpiece fixtures, the robot places them on the transfer station for the subsequent cleaning process. There a second robot picks up the parts and positions them on specially designed workpiece carriers. In an initial step the housings are passing through a cleaning station,

where they receive all-around cleaning with a special wash solution. After passing through a rinse-off zone the workpieces are then dried with hot air.

## Automatic quality control, application of a matrix code and packaging

The quality control fulfils two tasks: the camera system identifies the workpieces being processed with the aid of a raw part designator; at the same time, sealing surfaces are checked for potential surface faults. Components, which do not meet the required values, are automatically phased out of the system. The robot feeds all other (correct) components to a laser station, where a data matrix code is applied.



Surf-Finishers are utilising a rotating work bowl, which ensures an especially high processing intensity. In this version of the Surf-Finisher multiple components can be processed at a time

Subsequently, the robot places the parts in a specially designed small load carrier (KLT). As soon as one KLT is full, the robot changes its gripper tool to deposit the KLT in movable stacking cells, which were also part of the initial order scope. The stacking cells themselves are staged by company employees.

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## Mitutoyo invests in 10 rotary tables from RPI UK

RPI UK, the world leading specialist developer and manufacturer of precision positioning devices for high accuracy rotary and angular inspection systems, has welcomed Mitutoyo as a new customer following the Japanese manufacturers decision to invest in 10 rotary tables.

Mitutoyo, one of the world's leading manufacturers of precision measuring equipment, has integrated three QuadMatic and seven QuadSlimLine rotary tables into its high precision coordinate measurement machines (CMMs) at its Japanese and UK operations.

RPI engineers travelled to Japan to support Mitutoyo with training and maintenance and were also on hand to help integrate a two-axis rotary table at Mitutoyo in Halifax.

RPI's rotary tables are an ideal addition to high precision CMMs. Specifically designed as a fourth axis, they are accurate to +/- 0.5 arcs seconds. This is equivalent to hitting a golf ball at a hole more than 22 km away and scoring a hole in one every time!

Jim Palmer, RPI's sales manager, says: "It's great news that Mitutoyo has chosen to invest in 10 of our Quadrant range rotary tables. As well as significantly improving overall measurement accuracy and reducing uncertainty, our rotary tables also greatly increase measuring volume, thereby improving the flexibility, productivity and efficiency of our customers' CMM."

The addition of Mitutoyo to RPI's customer base means the Bath-based manufacturer now supplies all the major CMM manufacturers which use rotary tables, from Hexagon to Renishaw and LK to Wenzel.

RPI has been supplying the CMM market since 1977 and can boast more than 750 successful installations worldwide.

The QuadSlimLine and QuadMatic are part of RPI's Quadrant range of CMM tables, which also includes the QuadDualPurpose, QuadProfile and the QuadUniversal. They come in a wide size range, from Ø200 mm to Ø1,500 mm and can be fully integrated to the host machine controller.

RPI grew out of acquisitions from Optical Measuring Tools, Airmatic, Horstmann and Eimeldingen. It is now one of the world's largest designers and manufacturers of solution driven, highly accurate inspection systems and services that measure circular geometry and angular positioning.

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# Mazak sets new benchmark for UK manufactured machine tools

Yamazaki Mazak has underlined its commitment to the UK machine tool industry with the launch of its newest fully simultaneous 5-axis machining centre. The CV5-500 will be the only machine in its class to have been completely conceived, designed and built in the UK.

The CV5-500, which is currently being manufactured at Mazak's European Manufacturing Plant in Worcester, is being marketed with a highly competitive price point, making it ideally suited to subcontractors, start-ups and job shops.

The versatile 5-axis machine is unique in its category due to its high-rigidity bridge construction with a fully supported trunnion table that travels in the Y-axis direction under the bridge, ultimately delivering an extremely accurate and compact machining solution.

Alan Mucklow, managing director UK & Ireland Sales & Service Division at Yamazaki Mazak, comments: "While the numbers of British machine tool builders have dwindled over time, Mazak has consistently continued to invest in its UK R&D and production facilities. The CV5-500 is the latest in a long line of Mazak machines to have been fully designed and built in Britain. Not only does it set a new benchmark in British machine tool building it breaks the mould for the compact, fully simultaneous 5-axis machining category as a whole."

The CV5-500 features a newly designed constant overhang headstock to maintain machining rigidity even at the full extent of the Z-axis stroke. It is equipped with a 12,000 rpm spindle, capable of a peak performance of 18.5 kW and 119.4 Nm, making it suitable for a wide range of materials. An optional 18,000 rpm spindle, which includes core cooling through the X-, Y- and Z-axes ballscrews for thermal stability, is available for high-speed applications.

The machine is equipped with a high-rigidity Sankyo table, driven with roller gear cam, that provides a wide angle of rotation, specifically 220° in the B-axis and 360° in the C-axis. The CV5-500 delivers agile performance, with rapid traverse rates of 36 m/min in the X, Y and Z axes, and can process work pieces up to Ø500 mm x



The UK-made CV5-500 is a versatile 5-axis machine with a unique high-rigidity bridge construction and a fully supported trunnion table

H320 mm, and up to 200 kg in weight. Additionally, the Thermal Shield system maintains stable cutting accuracy by applying automatic compensation to combat temperature fluctuations.

As well as offering high performance, the CV5-500 design prioritises operator access and ergonomics without compromising the potential to integrate automation systems. The machine can be easily supported with a variety of automation solutions due to the addition of a side-loading door, robot interface and hydraulic and pneumatic fixture interface options. Crucially, access to the front of the machine remains uninhibited from automation equipment, means that operators retain convenient access for setups with full visibility of the machining operation at all times.

At just 2,300 mm x 2,790 mm, the machine is the most compact 5-axis machine in its class, making it ideal for general subcontract and job shops where floor space is at a premium. Careful attention has been paid to minimise the surrounding maintenance area, specifically with the coolant tank with side exit chip conveyor, that can be pulled out from the front of the machine to provide convenient access to key maintenance areas. In addition, the rear of the machine can be sited close to a factory wall to minimise floorspace.

The tool magazine comes with a 30-tool capacity as standard and an option for 48 tools if required, while the double arm ATC offers a fast tool-to-tool time of just 1.3 seconds. A side loading door to the magazine is standard which conveniently allows tools to be replaced even in automatic cycle.

The new machine is equipped with SmoothX CNC, Mazak's specialist 5-axis version of its SMOOTH Technology.

Alan Mucklow concludes: "The CV5-500 can deliver a step-change in productivity for both seasoned 5-axis users, as well as those looking to take their first steps in the technology. From its high-rigidity bridge construction and newly designed constant overhang headstock, to its ergonomic design and easy integration with ancillary automation systems, the CV5-500 is every inch the modern machining centre."

To find out more information, visit: [www.mazakeu.co.uk/CV5-500](http://www.mazakeu.co.uk/CV5-500)

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# 5-axis X5 machining centres from Starrag

The success of a Heckert HEC 800 X5 5-axis machining centre on titanium machining at Hyde Group's Hollygate Aircraft Components has subsequently led to the installation of a similar Heckert machine at sister Group company Victoria Production Engineering, for processing stainless steel parts.

Both X5s, supplied by Starrag UK, have enabled the companies to 'work smarter' by introducing twin-pallet machining instead of single-station, 3-axis working. This provides unprecedented utilisation levels due to the fact the machines' twin pallets enable efficient extended hours of machining.

In addition, not only do the machines' attributes such as integrated spindle monitoring, high-pressure coolant and excellent swarf removal allow for unmanned working, but the improved toolholding stability has also led to improved tool life.

Both companies are part of the Aero Products division of the Hyde Group; the North West-based leading engineering service provider that specialises in design, manufacture, tooling and support for a global blue-chip customer base that includes such companies as Airbus, BAE Systems, Boeing, Embraer, GKN Aerospace, Leonardo, MBDA and Rolls-Royce.

Paul Mellor, divisional technical director, explains how rising demand for the titanium workpiece at Stockport-based Hollygate spurred the search for "an improved way of working where we could effectively gain more from the same" in terms of replacing

machine-for-machine in terms of floorspace and manpower requirements, which led to the installation of the initial Heckert HEC 800 X5.

He states: "Rising order volumes for this long-standing contract meant we had to look at becoming more productive. It's all part of the Group's quest for continuous improvement and one of my roles is to work with all ten companies in the Division on investment plans which will meet both current and forecast demands as well as ensure we are installing fit-for-purpose and value-for-money production machinery.

"Our request for process improvements, using a test piece requiring heavy roughing, pocket machining, long-edge profiling and face and plunge milling was originally sent to six potential machine suppliers and Starrag was the only one that could meet the brief.

"We've been cutting titanium for over 30 years so seeing Starrag's proposals for process improvement, based around the implementation of different feeds and speeds, for example, as well as the use of a trunnion table for 4-5 axis working were very interesting, bearing in mind the components in question had been designed for 3-axis machining.

"We chose the 5-axis Heckert HEC 800 X5 with an uprated gear-driven spindle because not only did we want improved access to certain machined features on this existing part, thanks to 5-axis working, but we also needed a certain amount of



future-proofing in terms of spindle power for potential new work and to take advantage of any improvements in tooling technology."

With axis travels of 1,450 mm by 1,100 mm by 1,300 mm, the Heckert HEC 800 X5 not only easily accommodates the existing titanium workpiece but there's also capacity for additional, larger 5-axis work utilising its 80-position tool magazine and 800 mm by 1,000 mm pallets which can accommodate 1,200 kg loads.

Paul Mellor, who has been with the Group for 24 years starting as a machine programmer/operator in 1995 and appointed divisional technical director in 2007, outlines how similar process improvement strategies were employed for the stainless steel workpieces being machined by Victoria Production Engineering in Manchester.

He concludes: "Two aspects were of particular significance. These were Starrag's introduction of the use of special hydraulic 'sleeve' clamping, via the machine's hydraulics system, to consistently hold, yet not deform, the thin-wall tubular parts and the application of long-reach angle milling heads on the Heckert HEC 800 X5.

"The Heckert machine is used solely for internal milling on these pre-turned workpieces. The angle milling heads, of either 280 mm or 375 mm long, reach into the workpieces and perform all milling tasks. The heads are held and automatically changed via the machine's toolchanger.

"It's all about producing components right first time, every time and the Starrag machines and processes are fine examples of how we do that."

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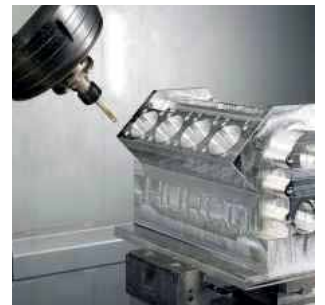


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# New high-speed 5-axis machining centre

Japanese machine tool builder Makino, which is represented exclusively in the UK and Ireland by NCMT has introduced a 5-axis, vertical-spindle machining centre, the D200Z. From roughing to high-speed finishing of multi-faceted and 3D contoured geometries, the machine boosts productivity when producing complex dies and moulds typically found in the automotive, injection moulding, packaging, medical and optics markets.

The 30,000 rpm spindle and integral, direct-drive table provide quick, precise, fully interpolative 5-axis machining. This capability combines with high-speed SGI.5 motion control software in the Makino Professional 6 CNC to maintain the tightest tolerances and quality requirements and ensure accurate blending of 3D surfaces, even during simultaneous 5-axis motion. All of these attributes are essential in the manufacture of modern dies, moulds and components of intricate geometry.

Designed to maximise working volume and load capacity, the compact D200Z accommodates workpiece sizes up to 300 mm in diameter, 210 mm tall and weighing up to 75 kg. The X, Y, Z axis travels of 350 mm, 300 mm and 250 mm respectively feature rapid traverse and cutting feed rates of 60 m/min. The machine utilises a lightweight B-axis structure with 0 to +180 degrees of tilt at 100 rpm. Both the B-axis and 150 rpm, 360-degree C-axis table feature direct-drive motors for accurate, high-speed operation.



Wide base castings and core-cooled ballscrews serve as a platform for enhancing overall process stability. The HSK-E50 spindle is designed with a core and jacket cooling system to control thermal growth, deflection and vibration during high-speed machining operations. As a result, the machine extends tool life in addition to providing exceptional surface finishes.

With flexible tool capacities and automation capabilities, such as the 100-tool capacity magazine with automatic tool changer and multi-pallet system, the D200Z can achieve utilisation rates of more than 80 percent for high levels of throughput and fast return on investment.

Makino's Industry 4.0 package of software tools, MPmax, is available for real-time process monitoring and data management. With the ability to connect a multiple machine network to a centralised computer, it allows manufacturers to retrieve, store and analyse high volumes of data in real time, enabling detection of and reaction to bottlenecks on the fly, whether it relates to underperformance or process errors.

### Horizontal machining centre is highly productive and compact

The MB-5000H Series 2 twin pallet, high speed, horizontal-spindle machining centre from Okuma, Japan, for which NCMT is also sole UK and Ireland agent, is another new machine whose thermal stability offers greater rigidity, higher acceleration, shorter tool change and table indexing times, and higher power compared with the previous Series 1 model. Powerful cutting capabilities and high speed automation reduce cycle times and increase productivity by up to 25 percent, while the 20 percent smaller footprint maximises utilisation of valuable shop floor space.

The 15,000 rpm, 26 kW, direct drive, internally cooled spindle is fed with cutters from a 48-position disc-type tool magazine. Integrated cutter breakage detection allows for autonomously managed sister tool



replacement. Static turning tools can also be exchanged to enable turning and profiling of bores and ODs using special turn-cutting software in the Okuma control that synchronises circular interpolation of the X and Y axes with spindle feed motion in Z.

With travels of 760 mm in the X, Y and Z axes, rapid traverse at 60 m/min and a highly dynamic, roller cam gear-driven B axis with 0.001 degree resolution, the MB-5000H enables efficient machining of the most complex parts, assisted by flood coolant to optimise chip management. In-process quality control can be integrated using a Renishaw RMP600 probe to inspect dimensions and feed the necessary offsets back to the control.

Okuma's Thermo-Friendly Concept is included in the specification, applied to both the machine structure (TAS-C) and the spindle (TAS-S), based on feedback from temperature sensors to deliver high accuracy machining in a normal shop floor environment. Tests have shown thermal deviation to be less than 10 microns over a 24-hour period, despite a variation in ambient temperature of as much as eight degrees Celsius.

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## Subcontractor doubles in size with the help of Hurco

In the last eight years, Cumbernauld-based contract machining specialist Cowie Engineering has doubled annual turnover, increased headcount from 13 to 24, having acquired in 2013 an adjacent factory unit of equal size to the original, raising the total floor area to 9,500 sq ft. During that time, the number of vertical machining centres (VMCs) on the shop floor, all of which are from Hurco, has also doubled to 10. Additionally, a Hurco 10-inch chuck CNC lathe has been on-site since 2011.

The latest Hurco addition was a VMX60SRTi 5-axis VMC with swivelling spindle head and flush rotary table, a design that is providing maximum working volume for single set-up machining of larger parts for the oil and gas industry.

It is also allowing the subcontractor to gain extra contracts from the motorsport sector, particularly for production of high tolerance components in one hit from materials ranging from stainless and other steels to aluminium and plastics. The use of linear scales rather than encoders for positional feedback from the linear axes, together with Renishaw part probing and tool length setting, provide the elevated levels of precision demanded in race car construction.

Tolerances held are from typically  $\pm 0.05$  mm down to 8 or 9  $\mu$ ms in total. It has necessitated the installation of a new coordinate measuring machine, an Aberlink 'Axiom too', in a temperature-controlled room, while a full-time inspector has been appointed to verify that F1 components



One of a pair of Hurco VM10i vertical machining centres, equipped with a 4th CNC axis, purchased by Cowie Engineering in 2018



A close-up of the Hurco 4th axis rotary table and tailstock securing a 316 stainless steel wheel bracket, part of a remotely operated vehicle for the offshore industry

coming off all the Hurcos and other machine tools are compliant.

Prior to the VMX60SRTi, the most recent VMC additions in 2018 were two of the manufacturer's latest generation VM10i machining centres, one of which has a 4th axis. They were preceded by the arrival of a VMX42t and a VM2, both of which were installed in 2016 equipped with Hurco 4th axis rotary tables. Other equipment in use includes seven more lathes and a Sodick CNC wire erosion machine.

Ross and Grant Cowie, sons of company founder Rodger, together with his wife Cathie and daughter Julie (who has just qualified as a chartered accountant) all work full-time in the business. It was established in 1999 and at the start all machining was carried out on manual mills and a lathe. However, it was less than two years before the first CNC machine arrived, a second-hand Hurco BMC25 with a 1,050 x 500 mm table, which allowed larger and more complex components to be produced.

The North Lanarkshire company has standardised on this make of VMC ever since due to the reliability of that early model together with the speed and user-friendliness of the conversational control, originally Ultimix and now called WinMAX. It was and still is ideal for producing the subcontractor's small batches of one-off up to 50-off.

Other Hurco machines followed: a VMX30 in 2011 which replaced the original VMC, a Hurco BMC4020 with 1,220 x 510 mm table in 2004, a VMX64 with an even larger table and 4th axis in 2009 and a pair of smaller VM1 models shortly afterwards.

The type of work undertaken by the ISO9001-accredited firm has changed over time. Early contracts were mainly in mining, defence, construction and bottling as well as in food and switchgear, but more business now comes from the latter two sectors as



Close-up of the manifold casing secured in the Hurco 4th axis

well as motorsport, the electrical industry in general and increasingly oil and gas, which now appears to be emerging strongly from a marked and sustained downturn.

New also in Cumbernauld in the last couple of years has been the installation of an off-line CAD/CAM system from OneCNC. Previously, all programs for the VMCs were created at the Ultimix / WinMAX controls using touch-screen conversational menus, sometimes with direct input of DXF data to describe more complex geometry.

Now, with the arrival of the CAD package, sections of ISO blocks can be extracted and inserted anywhere within a conversationally created cycle, any number of times, to stitch together a complete part program using the NC Merge feature within WinMAX. It considerably advances the subcontractor's programming capability.

Further useful features within the latest version of the Windows-based WinMAX software exploited by Cowie Engineering include Mill Polygon, which facilitates milling a multi-sided contour with equal-length sides; and Mill Slot, which creates a slot defined by a line or an arc segment and a width, the slot ends being round or square.



Another example of the use of NC Merge in WinMAX. The component is an oil and gas industry part machined from a solid billet of AISI 4140 steel

Swept Surface functionality built into the control also continues to be used frequently. It allows a 2D surface to be moved along a contour to create smooth 3D geometries within one conversational data block.

Ross Cowie comments: "We have historically machined a lot of stainless steel,

particularly for the food industry, and the material still accounts for around a fifth of throughput.

"Lately, new contracts have introduced diverse engineering steels as well as challenging alloys such as Duplex, Inconel and titanium, plus more aluminium and plastics.

"We use our Hurco 4th axis tables regularly to gain access to parts for machining on multiple sides, hopefully in one hit. We position them individually with or without a tailstock, or alternatively mount multiple parts on a trunnion for indexing. Sometimes we machine components requiring full simultaneous 4-axis cycles."

Today, the subcontractor is renowned for its quick turnaround and high-quality work.

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## One of a kind

A Mills CNC custom-designed and built automated manufacturing cell was due to be installed at Lenane Precision's facility in Smithstown, Shannon, County Clare in March 2020.

The cell represents a significant investment for Lenane and, when operational, will run 24/7 delivering significant productivity gains and process efficiency improvements to the company, substantially increasing its competitiveness.

The completion, this month, of a complex turnkey project, first started in early 2019, will see Mills CNC deliver and install a high-productivity and flexible custom-designed and built automated manufacturing cell to Shannon-based leading precision subcontract specialist Lenane Precision.

The cell comprising two Siemens 840D-controlled Doosan DVF 5000 (5-axis) machines and a Fanuc industrial robot also features:

A robot positioning track (also known as a RTU - Robot Transfer Unit) that runs between the two adjacent positioned DVF 5000 machines enabling the robot to service both (i.e. undertaking part loading and unloading operations).

Integrated racking systems that hold up to 36 x standardised sized pallets (400 mm x 400 mm with up to 140 kg maximum load) onto which workpieces are clamped and then loaded into the DVF 5000 machines, and machined components are unloaded from the machine and stored.

Two metre high safety caging/fencing that encloses the robot track and that restricts access to the DVF 5000 machines' loading/unloading operations.

At the heart of the system is a sophisticated and powerful touchscreen HMI that uses Mills' proprietary SYNERGI software to control the cell and that provides a seamless interface with the cell's machine tools, robot etc.

Lenane Precision, first established in 1994, is a company committed to continuous improvement and regularly invests in advanced machine tool technologies.

Since 2012, the company has, almost exclusively, become a Doosan machine tool user. In the last eight years Lenane has purchased four new Doosan machining centres, including two 5-axis machines, and three new multi-tasking lathes from Mills



Managing director Jim Lenane at Lenane Precision Ltd, at Mills CNC checking out the flexible automated manufacturing cell prior to it being delivered and installed at his company's facility in Shannon, County Clare

CNC. Over a similar period, the company has metamorphosed from a toolmaking company to one of Ireland's premier precision subcontractors.

Lenane serves a number of sectors for example aerospace, medical devices, oil & gas and it is the company's growing aerospace business, specifically the machining of high-precision aero-structure parts and its desire to move up and strengthen its position in the aerospace supply chain, that was the driving force behind the automated cell's inception.

Managing director Jim Lenane says: "The aerospace sector is global, challenging and demanding and, whilst success is never guaranteed, if you are unable to meet the industry's exacting quality requirements, stringent lead-times and cost down demands you're on a hiding to nothing."

Lenane's recent multi-axis, multi-tasking machine tool investments demonstrate its commitment to one-hit machining. For some companies the performance improvements gained from such investments may have been enough, but not for Jim Lenane: "My vision and ambition has always been to exploit the true potential of automation, the objective being to achieve continuous and seamless production in our facility, and to reduce as far as is possible the labour component from our machining processes.

"In reality I was waiting for the right time to realise the vision and, at the tail end of 2018 with orders from our existing aerospace customers reaching an all-time high and, with firm commitments from them to place more orders with us in the future, the decision to put these plans into action was made."

From the outset a number of potential automation routes were discounted by Lenane. These included investing in machine tools with integrated automatic pallet changers.

Jim Lenane explains: "Integrated workpiece pallet changers were clearly an option for us but, from a continuous production perspective, the number of pallets available had its limitations. I wanted something more ambitious - an automation solution that was future-proof."

"I knew that an automation solution that involved industrial robots was the direction of travel, so we set about exploring the options and alternatives."

To help the company select the optimum solution a number of prerequisites were drawn up:

Lenane's manufacturing cell needed to be inherently flexible. Although the company had earmarked the cell for machining high-precision aerospace components these parts would not be identical and would differ in their dimensions, materials, batch



size requirements etc. The intention was, in the first instance, to create a cell comprising two 5-axis machines serviced by one industrial robot. However, it was important that, in the future and to improve productivity still further, that additional machine tools could be integrated into the cell system, if and when required.

Owing to floorspace constraints at Lenane's facility the cell needed to be compact and have a linear configuration. The idea of positioning two machines adjacent to each other and have the robot service them from behind on a track would optimise the space available.

An automated cell comprises, quite literally, a number of moving parts. Lenane's intention was to opt for a one supplier to project manage the cell's design, development and implementation - including the sourcing of all cell elements and equipment, and to manage all relationships with third party suppliers.

Jim Lenane continues: "We were looking for a turnkey solutions supplier to manage all aspects of the cell's design and build. From an efficiency and sanity perspective, it was important that we had a single point of

contact for all communications relating to the cell and not have to manage relationships with the different equipment suppliers."

Lenane approached a number of turnkey providers early in 2019 with their requirements and ultimately awarded the project to Mills CNC. Every year Mills CNC manages a number of turnkey projects for new and existing customers. A significant percentage of these involve industrial robots and the creation of flexible automated manufacturing cells.

At the heart of Lenane's automated manufacturing cell are two Doosan DVF 5000 machining centres.

The machines, providing full 5-axis simultaneous machining capability, are equipped with 17.5 kW/12,000 rpm spindles and servo-driven automatic tool changers (120 position), featuring linear guides and integrated thermal compensation systems for increased accuracies and repeatability.

The two machines specified by Lenane were both equipped with the Siemens 840D control.

DVF 5000 machines are automation ready and can be supplied with a automatic door

open/door close facility. The machines also have good (side) access for robot loading and unloading.

Jim Lenane says: "The DVF 5000 machines' speed and accuracy look impressive. The 120-position tool changers on both machines will help us ensure 24/7 unattended and lights-out operations, as will their high-efficiency swarf management systems. And the integration of spindle and table probing for in-process inspection ensures greater process security and reliability.

"Although the machines are an integral part of the cell, they can, if required, be used independently and autonomously, thereby increasing our overall machining flexibility."

Lenane's flexible automated manufacturing cell is being delivered in March 2020, with on-site training occurring later in the month.

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# 'Fast Make' specialist Raysun Innovative Ltd turns to XYZ for toolroom update

Rugby-based Raysun has developed its business from a designer and manufacturer of bespoke jigs and fixtures with a well-equipped toolroom facility to become one of the UK's leading 'Fast Make' specialists for turbine components, with a particular emphasis on development of smaller hot gas parts such as nozzle guide vanes, seal segments, seal carriers and turbine blades for aerospace and land-based applications.

This involvement with the turbine industry came from Raysun's early collaboration on the Rolls-Royce Viper Grinding project where both Tyrolit and Raysun engineers were heavily involved with Rolls-Royce in the invention, development and exploitation of the Viper technology. Through this work, Raysun had a need to update its toolroom capacity and the addition of Heidenhain controls to the XYZ Machine Tools HD vertical machining centre range brought the two companies together for the first time.

Raysun's involvement in the Viper Grinding project also opened up opportunities to further diversify the business, which saw the introduction of its 'fast make' concept that provides rapid product development of small hot gas turbine components.

"Typically, it could take an OEM 12-18



months to take these parts from concept to production ready parts. With our systems and flexibility, we can achieve this in under six months. Typically, we spend 4-6 weeks on each stage of the project, with these being design, jigs and fixture production and final product development, with machining work spread across our toolroom and separate production facility," says Charles Ray. "The result of this fast make concept has been rapid growth over the past three years, and we have several active projects in-hand for major customers, which have placed additional pressure on the ageing machinery within the toolroom."



A legacy of the work on Viper Grinding meant that virtually every machine at Raysun featured a Heidenhain control and this would be the first tick box in selecting any replacement machine. The recently added option of the Heidenhain TNC 620 Control, to its HD range of vertical machining centres, brought XYZ Machine Tools to the attention of Raysun. "Without the choice of the Heidenhain control, which we are very familiar with, we probably wouldn't have even considered XYZ as an option, but when we saw it was available the other aspects of machine choice fell into place," explains Charles Ray. "The toolroom works on a wide range of parts some with small high precision features and other much larger

items such as assembly jigs for building cars. To cover the range of requirements a machining centre with a reasonable size table was required and the XYZ 800 HD was ideal. The combination of the XYZ 800 HD machining centre and the Heidenhain control has definitely impressed us and it fitted our requirements well, with the added benefit of being a price competitive package that was available in the time-frame that we had available."

Raysun now has two XYZ 800 HD VMCs in place, being fully employed in a variety of toolroom applications. Constructed around a 4,400 kg solid cast base and column, with traditional box slideways on all three axes, the XYZ 800 HD provides an ideal machining platform for a wide range of components, with a mix of rigidity and agility supported by a 24 position toolchanger and 33 hp, 25 kW /10,000 revs/min spindle.

Raysun also needed to add to its turning capabilities and here it compromised on its desire for Heidenhain control and took delivery of an XYZ SLX355 ProTurn lathe with the SLX ProtoTRAK control. With milling, grinding and EDM being the key areas within the toolroom turning is an aspect of the business that has a lesser, yet vital, role to play and one where versatility is key.

With these three machines from XYZ Machine Tools in place, the Raysun Toolroom is better positioned to meet the expectations of the 'Fast Make' side of the business as well as individual customers for its general toolroom services.



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## World premieres from DMG MORI in Pfronten

### New advanced machining centres unveiled

The new DMU 65 H monoBLOCK and DMC 65 H monoBLOCK unite the flexibility and ergonomics of a 5-axis universal machining centre with the productivity and process reliability of a horizontal machining centre

The revolution in universal horizontal machining comprises: 5-axis machining with a horizontal gentry concept; workpiece dimensions of  $\varnothing 630 \times 700$  mm and maximum 600 kg workpiece weight; modular design with speedMASTER and powerMASTER spindles; wheel magazine with up to 543 tool pockets; optional rotary mill-turn table; application-specific automation solutions available.

With the DMU 65 H monoBLOCK and DMC 65 H monoBLOCK, DMG MORI presented these new highlights in horizontal machining at the Open House in Pfronten.

The unique horizontal gantry design makes the machines ideally suited for demanding applications like those in the machining of aerospace structural components, for example. Users in the die & mould branch benefit from the possibility of completely machining deep hole bores of up to 550 mm directly on one machine. A sturdy and thermo-symmetrical construction, optional linear drives and modular design with spindles from the MASTER series plus the patented wheel



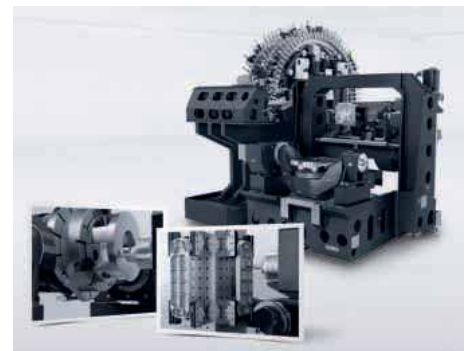
The horizontal machining concept meets the requirements of demanding branches

magazine mean the machine can be equipped optimally for demanding applications.

The inherently rigid machine bed with 3-point support, extensive cooling concept, thermo-symmetrical design and swivelling rotary table with bearings on both sides with which the DMC H 65 monoBLOCK is equipped provide the ideal basis for the consistently accurate machining of complex workpieces. The concept of horizontal machining enables optimum chip flow and thus also perfect heat dissipation to ensure process reliability in production.

In the version with linear drives, the world premieres prove highly productive machining centres with rapid traverses up to 100 m/min and 1 g acceleration. The DMU 65 H monoBLOCK and DMC 65 H monoBLOCK can accommodate twelve

pallets with workpiece dimensions of  $\varnothing 630 \times 700$  mm and maximum 600 kg workpiece weight. The ergonomic design of the machining centres offers optimum accessibility and as a result a high level of user comfort during setting up. New jobs can be set up parallel to machining at any time with the pallet changer or rotary magazine.



The optional wheel magazine can accommodate up to 543 tools

The modular design leaves nothing to be desired where equipment is concerned. This includes speedMaster spindles with speeds up to 20,000 rpm and a powerMASTER spindle with HSK-A100 interface and 288 Nm torque. In other words, the DMU 65 H monoBLOCK and DMC 65 C monoBLOCK are ideally equipped for the demands arising from the electrification of the powertrain. A chain magazine with maximum 60 tool pockets or a wheel magazine that can accommodate up to 543 tools mean the machines can be equipped in-line with requirements. Where controls are concerned, the world premieres come equipped with CELOS. Both the SIEMENS 840D as well as the Heidenhain TNC 640 are available.

As a special highlight the DMU 65 H monoBLOCK and DMC 65 H monoBLOCK



The DMU 65 H monoBLOCK and the DMC H 65 monoBLOCK are based on an inherently rigid and thermo-symmetrical gantry concept that offers optimum chip flow

are also available as mill-turn versions, which allow the complete machining of components with up to 1,200 rpm.

As DMG MORI sees the future of manufacturing in automated production, there are a number of very different automation solutions available for both horizontal machining centers for customers to choose from. The offer ranges from the flexible PH-AGV 50 to linear and rotary pallet storage and on to include the new PH CELL, thus ensuring individual automation depending on the production area and order volume. All automation solutions can be connected to both the DMC 65 H monoBLOCK with double pallet changer for shorter idle times, as well as to the DMU 65 H monoBLOCK, which impresses with its especially large workpiece diameter. Thanks to horizontal machining and the resulting ideal chip flow, the horizontal machining centres are especially suitable for unmanned and minimally manned production.

### Versatile automation solutions are decisive for future-oriented production

With the flexible and space-saving PH CELL, DMG MORI enables the automation of numerous 5-axis universal machines and vertical machining centre.

The modular automation concept comprises: a flexible automation solution for up to 40 pallets; modular design; different sizes of pallets - 500 x 500 mm, 400 x 400 mm, 320 x 320 mm; up to 300 kg transfer weight; a footprint of only 10.7 m<sup>2</sup>; the option of subsequent integration with existing automation interface.

DMG MORI presented the new PH CELL on a DMU 65 monoBLOCK at the Open House in Pfronten. The compact automation



In addition to the normal setup station, the modular design also includes a version that can be rotated in 90° steps for improved ergonomics during setup parallel to production

solution offers a high degree of flexibility. The modular design enables an individual number of pallets in different sizes. DMG MORI will offer the PH CELL for a wide range of machining centers, starting with the models from the monoBLOCK series.

With a footprint of 10.7 m<sup>2</sup>, the PH CELL is a space-saving automation solution, which enables very autonomous manufacturing even in tight production areas. The pallet system is based on a modular design and offers a high degree of flexibility. The basic version with one shelving module can process up to twelve 500 x 500 mm pallets, sixteen 400 x 400 mm pallets or up to twenty 320 x 320 mm pallets, distributed over three or four shelves.

The system can also be expanded with a



The system can also be expanded with a second shelving module providing up to 40 pallet storage spaces

second shelving module providing up to 40 pallet storage spaces. The second shelving module can also be subsequently integrated. The height of the shelves can be easily adjusted. Every shelf can hold up to 600 kg. The transfer weight is maximal 300 kg. In addition to the normal setup station, the modular design also includes a version that can be rotated in 90° steps for improved ergonomics during set-up parallel to production.

The concept behind the flexible PH CELL is that numerous machining centres can be connected, and thus optimally supports DMG MORI's automation strategy. Initially available on the DMU 65 monoBLOCK, it will successively be available on the DMU 50 3rd Generation and the DMU eVo series from May 2020. This will be followed from July with the duoBLOCK models, the CMX U universal machines and the DMC V and CMX V vertical machining center models. It is possible to connect the PH CELL to the machines retrospectively. The prerequisite for this is that an automation interface is available on the machine.

With the new development of the PH CELL, DMG MORI remains faithful to its principle of offering an economical automation solution for almost every machine.

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The highly flexible PH CELL is designed to be module and offers optimal accessibility

# HSC milling: highly productive, high-volume production for surgical instruments

Surgical instruments are high-precision products that are manufactured with great care, usually in small quantities. The structures and equipment of manufacturers specialising in these products are therefore designed above all for a high level of flexibility in retooling. A separate process chain should accordingly be set up for one-time products in large quantities. The key element is a two-spindle machine from Schwäbische Werkzeugmaschinen GmbH (SW) with very high repeat accuracy.

“The requirements are high and the competition is hard in manufacturing of precision mechanical surgical instruments,” explains Frank Pauschert, regional sales manager of SW, Schwäbische Werkzeugmaschinen GmbH in Waldmössingen, Germany. His customers include a company in this sector that has grown from modest beginnings when it was founded in the 1980s to become a mid-sized enterprise with about 130 employees.

Currently about 1,000 different utensils are manufactured for a wide range of surgical applications. All instruments come complete and ready for use. The individual parts are made of premium biocompatible materials such as stainless steel and are manufactured in machining processes. Despite the use of modern NC-controlled machine tools, manual operations make up a great deal of the manufacturing process for these instruments because they consist of up to 40 different components that must be refined, surface-treated and assembled meticulously by hand. In addition, they are often manufactured with numerous variants. This necessitates small batch sizes and because of that, a prime requirement of the relevant manufacturing systems is very flexible retooling. Due to the extraordinary diversity of variants, there is also no way to work from stock, thereby lowering costs by manufacturing in larger batches.

Since the manufacturer has not previously produced any of its own products, it is constantly compared with the numerous competitor products already available in terms of price by customers, that often have great market power. This limits profitability and, with it, future growth possibilities.

To safeguard the future in the long-term,



The fully automated SW BA 321 dual-spindle machining centre produces two completely machined forceps halves every three minutes. Source: Klaus Vollrath

a decision was made about two years ago to enter an extremely challenging large-scale production project: manufacturing of a one-time tool for neurosurgery that is used so often that hundreds of thousands of units are needed annually. It is a type of forceps made of aluminum that can be used to grasp tissue components while at the same time stopping minor bleeding with electrical pulses. Minute tubes were also integrated into each arm of the forceps through which an irrigation fluid can be directed into the operating area. Despite its straightforward appearance, the instrument requires very time-consuming manufacturing with numerous mechanical and manual work cycles, all of which must meet strict quality requirements. Many of these work cycles have to be carried out under a microscope. Setting up the process chain requires extensive development efforts as well as investments in machines and special equipment. Additional employees are currently being hired and qualified for this purpose.

The starting point and key element of the process chain is an automated dual-spindle BA 321 machining centre from SW. The system has a working area of 300 x 500 x 375

mm per spindle. The spindles are equipped with an HSK A63 interface and reach speeds of up to 17,500 rpm with a chip-to-chip time of 2.5 s. The tool change system has a capacity of from 2 x 20 to a maximum of 2 x 60 slots. This system is used to mill forceps halves made of aluminum. It has a custom-made automation unit for supplying material and removing milled parts. It is only intended for a limited range of parts, but within that range achieves productivity far beyond any other milling centres in the plant. With its horizontal, dual-spindle design, the new machining centre delivers two completely milled forceps halves in just three minutes.

Thanks to the automation system, it can do this around the clock, largely without supervision. The machine also features impressive repeat accuracy and thus quality of manufactured parts. In addition, it significantly surpasses the throughput performance of the other machining centres installed on site.

“We chose SW first of all because we were impressed by the productivity of the double spindle concept,” says Frank Pauschert. “Another aspect was their impeccable references as well as the relative proximity,

which would mean short response and travel times both during the joint development phase to come and also for any service calls that might be needed."

The initial contacts in the summer of 2017 led to a partnership-based collaboration during which the possibilities for automation of machining processes was clarified. This was followed by joint design and development of a special machine based on the model BA 321. Special press-drawn sections in three different dimensions are used as raw material. The forceps halves are carved out of the sections and are not separated by sawing until the last work cycle. This neatly sidesteps clamping problems with the extremely slender and delicate forceps halves from the outset. The final saw cut is made so that a minimal amount of burr remains to prevent the pieces from falling down. Otherwise the very delicate tips of the forceps could be damaged. The forceps are removed by special adapters loaded into the spindles from the tool magazine. They are used to hold the forceps parts and break off remaining burrs. Then they are deposited individually on a transport drawer and moved by conveyor belt to the removal station, where they are manually inserted in basket racks for the next work cycles. "The joint development of automation was very efficient thanks to the professionalism of both teams," recalls Frank Pauschert.

Thanks to "life startUp" production monitoring in the first week after commissioning, the employees became familiar with operating the machine quickly and were able to work independently with it. With "life data", an online service of SW, the machine is continually connected online to SW, where essential machine parameters are monitored nonstop. If problems come up, action is taken immediately. Good use



Thanks to "life startUp" production monitoring in the first week after commissioning, the employees became familiar with operating the machine quickly and were able to work independently with it. Source: Klaus Vollrath



An elaborate drawer mechanism ensures controlled deposit on a conveyor belt. Source: Klaus Vollrath

has already been made of this service, as the machine operator was supported by remote diagnostics. "life help" also turned out to be very helpful: When problems occasionally came up, it provided quick and very competent consulting, and if a service employee was needed at all, he was often on site for less than an hour. Without this service, there is much that would not have worked, or would have taken much longer. An additional BA 321 has already been ordered and notification has been received for delivery in August 2019.

The BA 321 is the two-spindle version of a series that is available as a one, two or four-spindle machining centre depending on the task. It is suitable for machining workpieces made of aluminum, cast iron, titanium or steel. The heart of the monoblock is the working area with dimensions of 300 x 500 x 375 mm and the spindles which are movable in three axes. The spindles with HSK-A63 interface reach speeds up to 17,500 rpm with an output of 32 kW (4,200 rpm, 40 percent duty cycle) and a torque of 72 Nm. The spindle distance is 300 mm. The weight of the system is about 8,500 kg, while the standard installation dimensions are 3.60 x 3.13 x 6.00 m (W x H x D). The series 3 is available as a single-station machine or with a double swivel carrier.

The feed of the 3-axis unit is provided by sturdy ball screw drives, with rapid traverse axis reaching speeds of 65/75/75 m/min (X, Y, Z-direction) and axis acceleration rates



The automation unit consists of a supply unit for the press-drawn sections and a drawer for depositing parts after they are separated. Source: SW GmbH

of 10, 10 and 15 m/s<sup>2</sup> respectively with a maximum feed force of 8,000 Nm. The pick-up tool changing system has a capacity from 2x20 to max. 2x60 tools in the two-spindle variant. Tools up to Ø 70 mm (160 mm with free adjacent slot) with a maximum length of 275 mm and a maximum weight of 7.5 kg can be picked up. The chip-to-chip time is about 2.5s. The Sinumerik 840 D sl, Bosch Rexroth IndraMotion MTX or FANUC 30i are available as control units.

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# Precision packed into a small footprint

Headquartered near Barcelona, Vilardell specialises in the production of precision parts with a high added value and comprises two divisions, the Medical Division and the Industrial Division.

Vilardell has specialised in the production of highly complex parts for some time as Jordi Roy Torras, manager of the Industrial Division explains: "This is our core competence. Something we have developed year after year and part by part.

"We employ 165 staff and they are very important to us," he explains. "Almost every day, we are faced with new challenges. Even with the best machines, we wouldn't be able to tackle these challenges, if we didn't have such a strong team. Our customers know that they can count on us and on our expertise when it comes to meeting any machining challenge. We have to keep our minds open and focus on innovation as one of our key values. Each and every one of us has to remain innovative, irrespective of his or her position or function within the company. That's essential for our business."

Fortunately, the company has the foresight to invest in technology from Tornos. The long-standing collaboration with Tornos now boasts an impressive inventory of equipment that includes a small number of single-spindle cam machines (T-4, R-10 and MS7), plus a large number of multi-spindle machines (AS 14, SAS 16 and SAS 16 DC). In terms of CNC machines, the company's fleet includes the Deco 10, Deco 13, Deco 20, Sigma 20 and the EvoDeco 16 models.

Jordi Roy Torras continues: "We are determined to provide our customers with



comprehensive service and are collaborating closely with them. We try to understand their needs and provide advice to jointly optimise the machining processes. Over time, we have gathered a profound expertise in our key markets, and we can efficiently advise our customers in various fields, be it in the automotive, aerospace or in any other industrial sector requiring precision-turned parts."

"The focus is on high added-value products and this requires us to integrate new technologies, such as the latest machines from Tornos. We also pay special attention to quality and we hold ISO: 9001 and IATF: 16949 certifications."

Recently, Vilardell purchased a MultiSwiss 6x16 machine. So what made the company opt for this machine? "The choice was driven by rational motivation. In terms of technical specifications, the machine is simply the best in the market. However, we had to also consider the restricted space in our plant. The MultiSwiss boasts the most compact footprint and is definitely the most efficient.

"At first sight, this small footprint may seem to be trivial. However, it makes the difference. The machine is really doing well and the fact that it is equipped with a container comprising all peripherals is a key

advantage for us. The machine works perfectly and the peripherals are very well integrated."

"We are extremely satisfied with the machine performance. The hydrostatic features work wonders and we are able to achieve an excellent surface finish whereas the tool wear is well below the wear of conventional machines. In addition, the machine boasts excellent ergonomic features."

"The operator can really enter the machining area without difficulty. The tools can easily be installed in the machine without the need for the operator to lean into the machining area and the machine setup can be realised in next to no time. The MultiSwiss doesn't only offer excellent



performance but also complete ease of operation. Thanks to its high level of productivity, the machine enables us to multiply our performance per square metre while guaranteeing an outstanding part quality both in terms of precision and surface finish."

"It should also be noted that the collaboration with Tornos is excellent and that their service stands out for its high responsiveness. "This really is a combination that pays off for us," concludes Jordi Roy Torras.

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# Discover a pair of medical manufacturing miracles at Med-Tech Innovation Expo 2020

Two companies with a proud track record of delivering innovation in the medical manufacturing industry are preparing to reveal how their technology continues to break new ground in the field.

OGP UK and SYS Systems, both part of the South Derbyshire-based Carfulan Group, will be exhibiting at the Med-Tech Innovation Expo 2020 on 29th-30th September at the NEC in Birmingham. The show, which attracts thousands of designers, engineers, innovators and manufacturers, will offer live demonstrations of the latest machines, technology, products and services from across the medical device supply chain and healthcare sector.

OGP UK specialises in multi-sensor metrology systems which can gauge the characteristics of even the most complex parts in real time and without human error, leading to better quality, reduced scrap and allowing products to be brought into the marketplace faster.

Its success in the medical arena has seen it develop processes that ensure the exact drug dosage is dispensed from asthma inhalers made by multi-national pharmaceutical companies like GlaxoSmithKline, as well as improving quality control processes and driving up productivity for medical injection moulding customers.

OGP UK will be displaying the powerful CNC200 at Med-Tech, a machine capable of supporting a combination of touch probes, micro probes and laser scanners, maintaining the highest levels of accuracy while working even in the most hostile production environments.



As a UK Stratasys platinum partner, SYS Systems has been at the forefront of the 3D-printing movement for more than a decade, supplying, installing and supporting the full Stratasys product range. Its solutions have helped doctors to print surgical guides, models and prostheses to improve outcomes for patients, support pioneering reconstruction surgery and dramatically speed up product development times by enabling prototypes to be made quickly, easily and accurately in a range of high-class and lifelike materials.

SYS Systems will be bringing along the Objet350 Connex3 to the show, which was the first system in the world to simultaneously 3D-print multiple colours and materials.

Its flexibility allows users to create models with the look, feel and properties of real production parts, as well as quickly and easily print off custom jigs, assembly fixtures and tooling with ultra-fine accuracy. Intuitive GrabCAD software makes achieving high-quality builds simple, with no need for post-processing.

OGP UK and SYS Systems will exhibit on stand **F59** at Med-Tech. More information can be found at is available online at **www.ogpuk.com** and **www.sys-uk.com**.

The Carfulan Group is a family-owned business, founded in 1989, made up of a

team of engineering experts and based at its Innovation Centre in Foston, near Derby.

It specialises in providing the most advanced manufacturing technology solutions available on the market, helping to bring ideas into reality and streamlining company processes, across four divisions: OGP UK, SYS Systems, ZOLLER UK and VICIVISION UK. Its work covers supplying and servicing for multi-sensor inspection equipment, 3D printing and tool pre-setting and measurement, as well as turned-part measurement solutions.

Clients include world-leading companies in the aerospace, automotive, oil and gas, medical, education and 3D design sectors.

Over the past decade the Carfulan Group has enjoyed huge growth and now employs more than 50 people and company turnover is close to £13 million annually, with plans in place for further expansion.

In both 2018 and 2019 it was named one of the London Stock Exchange's '1,000 Companies to Inspire Britain,' recognising it as one of the nation's most outstanding small to medium-sized businesses.

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# AgieCharmilles CUT 2000 X wire EDM features new Spark Track technology and a host of other innovations

GF Machining Solutions has upgraded the AgieCharmilles CUT 2000 X wire EDM with new Spark Track technology and an Integrated Vision Unit (IVU), offering accuracy and productivity for even the most demanding applications.

## Streamlined production management

The CUT 2000 X's Vision 5 software interface allows manufacturers to optimise production, achieve flexible job management and improve quality and productivity.



GF Machining Solutions' Vision 5 interface simplifies last-minute machining sequence modifications and allows for special actions to be introduced directly inside the job to ramp up quality and productivity.

## Improved productivity and lower costs with AWC

Open guides on GF Machining Solutions' automatic wire changer (AWC) allow manufacturers to use a combination of different wire diameters between roughing and finishing, thereby reducing machining time for small and complex geometries, resulting in up to 32 percent greater productivity.

Additionally, two 25 kg wire spools are available that eliminate the need to modify the wire circuit when switching wires, which increases flexibility.

## Controlling sparks improves EDM wire life

GF Machining Solutions' new Spark Track technology represents a major innovation in wire EDM process performance and reliability.

Spark Track is GF Machining Solutions latest EDM software monitoring system that adjusts the rate and intensity of sparks along the length of the wire and, in doing so, prevents heavy wear from occurring at any point on the wire - extending its life and preventing breaks.

At the heart of the innovation is GF Machining Solutions' generator technology - specifically its high-performance ISPS (Intelligent Spark Protection System) module - which accurately identifies the intensity and location of sparks along the wire and, when necessary and required, adjusts current and voltage rates to prevent concentration of wear on the wire.

Spark Track provides comprehensive and real-time spark distribution information to manufacturers, enabling them to push their EDM machines to the limit.

Martin Spencer, managing director at GF Machining Solutions UK says: "The ISPS module eliminates wire breakage regardless of machining conditions and, as such, makes manufacturers' wire EDM processes more reliable and secure."

Spark Track solves problems such as wire oscillation which can occur when machining different heights and tapered surfaces and can lead to wire breaks and damaged workpieces.

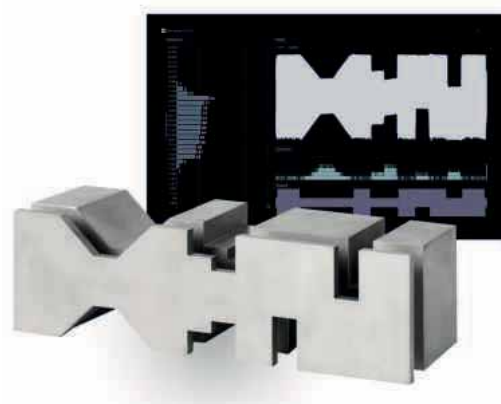
"Superior wire cutting performance is achieved when discharge distribution, along the wire, is as uniform as possible. Spark Track enables this to occur," explains Martin Spencer.

ISPS and Spark Track, working in combination, not only prevent wire breaks but also as a consequence eliminate time intensive resets and reduce the amount of time an operator has to devote to a given job. They also help extend wire life.

Other recent developments introduced by GF Machining solutions to better regulate the spark output of its machines include: the standardisation of high-performance generators across all of its EDM machines; the redesign of its machines and the positioning of its generators to place them as close to the wire as possible. This makes the machines more responsive and able to react quickly to

inputs from the control by reducing the distance computer signals and sparks need to travel.

Wire oscillation, varied heights and tapered surfaces are among the common problems resolved by Spark Track technology. To achieve superior results, discharge distribution along the wire must be as uniform as possible. Spark Track and ISPS offer users a fully automatic solution that improves efficiency and reduces wire breakage.



## Unmatched quality with Integrated Vision Unit (IVU) Advance

With IVU Advance, users can reduce setup times, are able to check reference points without a measuring machine and can correct machining errors to achieve improved quality and increased productivity. A charge-coupled-device (CCD) camera mounted on the machine reduces the need for an operator's presence while ensuring perfect results.

Using this onboard measurement system to analyse light intensity variation allows detection of edges, which saves costs and facilitates closed-loop manufacturing. At the same time, multiple measurement systems are available for part control and set-up along with automatic shutter and part cleaning solutions. Users achieve greater autonomy over results with the integration of automation-compatible, total measurement control.

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# Living and breathing continuous improvement

A leading aero-engine component manufacturer has made a significant investment in its plant, equipment, processes and people to maintain its competitive edge in the global aerospace sector.

West Midlands-based Electro-Discharge Ltd, part of the MJ Sections Aerospace Group, is a market-leading subcontract specialist with a reputation in the market for innovation, technical excellence and customer service.

The company, as its name suggests, is a pioneer in the use and application of EDM technology and, ever since the company was first established in 1980, regularly invests in the latest EDM wire, die-sink and hole-drilling machines to improve its competitiveness.

## New technology investment

In 2018 the company made a significant investment in a new technology with the purchase of its first £1m state-of-the-art laser cutting and profiling machine.

The TRUMPF TruLaser Cell Fibre 7040 5-axis CNC industrial laser cutting system has a large working capacity (X-axis 4,000 mm; Y-axis 1,500/2,000 mm; Z-axis 750 mm) and is ideally suited to laser cutting high-strength, heat-resistant materials used in the aerospace sector and other high technology industries.

A key strength of the TRUMPF machine and a major reason why it was purchased is

its solid-state laser beam which is guided through a fibre cable. This makes the machine more accurate, more consistent, faster and more efficient than the CO<sub>2</sub> equivalent machine.

The machine has full 5-axis capability enabling it to machine complex high-precision 2D and 3D parts quickly and accurately in a single set up and, for additional productivity, the working area can be partitioned into two separate work zones allowing either one large, or a number of different sized, workpieces to be machined at the same time.

The machine was installed at the company's 24,000 square foot facility in Cradley Heath in September 2018 and is being used to laser cut and trim a range of high-precision aero-engine components.

These include different diameter aero-engine rings made from tough and difficult-to-machine materials that include titanium, inconel, nimonic alloys etc.

Prior to the arrival of the TRUMPF machine these rings were machined on the company's high-performance EDM (wire and die-sink) machines. Whilst the use of EDM technology for such applications did deliver the high accuracies and surface finishes required, machining processes were both long and labour intensive and involved multiple and frequent setup operations.

Rupin Vadera, general manager at Electro-Discharge, says: "To compete effectively in the aerospace sector you need

access to the latest and most advanced technologies.

"We have always invested in the latest EDM technology and have a total of over 40 machines at our disposal. We push these machines hard and operate 24/7 operations. However, despite running the EDM machines unattended and overnight - we believed we weren't being as productive as we could or needed to be."

The dramatic productivity gains available from using laser cutting instead of EDM technology is evident in the following example: to machine 24 slots in a 1 m diameter aero-engine ring made from a Nimonic material using EDM technology took nine hours to complete whereas the same part, using a laser machine, was machined to completion in minutes.

Rupin Vadera continues: "To machine the ring using EDM technology required us first making complex jigs and fixtures. The ring had to be held vertically in the EDM machine and only six slots out of the 24 could be machined at one time. This meant that the ring had to be repositioned and set up four times before it was completed.

"With the laser machine the ring was laid flat on the machine's bed and, after setup, was machined in one hit."

Although the processing speed of the laser machine is far quicker than that of an EDM machine the company still relies heavily on its EDM technology.

"The laser machine frees up capacity on our EDM machines," says Rupin Vadera. "Other high-precision aerospace parts are machined on our wire and sink machines. The laser machine has helped us reduce production bottlenecks."

The laser machine tool investment made by Electro-Discharge was part of a much wider investment programme implemented by the company during 2017 and 2018.

In addition to investing in the new laser machine and five new EDM machines, 2018 was a landmark year for Electro-Discharge as it involved a complete relocation of the company to new and much larger premises in Cradley Heath.

Rupin Vadera comments: "Since the company was taken over by its new owners John Harding and Paul Jordan in 1999, our premises in Dudley, were becoming a bit cramped and were proving to be unsuitable.

"We recognised back in 2017 that this



The TRUMPF laser cutting machine in action at Electro-Discharge's facility in Cradley Heath

shortage of space would only become more acute as we grew, increased our headcount and invested in new technology. As a consequence, we set about looking for new premises."

The key driver behind Electro-Discharge's relocation was the company's desire to move to larger premises. But it wasn't the only consideration.

Rupin Vadera continues: "It was important, from a staff perspective, that the new premises were geographically proximate to our existing location. We certainly didn't want to inconvenience staff by selecting premises that were miles away."

Effective and timely communications to keep staff, as well as all customers and partners, informed about the move was a critical aspect of the planning process.

"We knew the move would interrupt our production processes," says Rupin Vadera. "As a consequence, we had to build up in advance buffer stock of customer parts and components to ensure that the move did not adversely affect customers' operations and production schedules.

"We had to inform customers and awarding bodies that the relocation would mean that previously held accreditations and certifications, i.e. ISO 9001, NADCAP, Rolls-Royce SABRe 9000 etc., would need to be re-applied for.

"Once we had identified suitable premises, we needed to undertake a strategic and accurate assessment of the new facility and what needed to be done to ensure it met our immediate and future requirements."

"We moved into the new facility in October 2018 and haven't looked back," says Rupin Vadera. "Although the new premises are



Inside Electro-Discharge's new facility in Cradley Heath

only a stone's throw away from where we were, it's light years ahead in terms of its look, feel, capacity and functionality.

"We are a major player in the aerospace sector. We now have a facility that matches our market-leader status."

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# Multi-function lathes with internal robotic load/unload

The Okuma Spaceturn LB3000 EX II turn-milling centre will make its first appearance in the UK equipped with the Japanese manufacturer's Armroid robotic arm, the first in the world to be integrated inside a CNC machine tool. It will be configured for automated handling of shaft-type parts. All Okuma machines are sold and serviced exclusively in the UK and Ireland by NCMT.

Three different end-of-arm effector options are available for the robot, capable of performing different tasks. One is for blasting the cutting zone with air to improve chip management. Another provides additional support during the cutting process to prevent chatter. In combination with a workpiece stacker, the third effector automatically loads and unloads workpieces weighing up to 5 kg. All three are stored within the machine and are changed automatically by the robot.

While most conventional robotic systems require complex integration and special training for staff, Armroid needs neither. As the robot is part of the machine tool, separate system integration is unnecessary. Using Okuma's own OSP-P300A control, an operator enters the coordinates for the start and finish points and the robot moves through its motions, the cycle being automatically generated to avoid collisions. In addition to automated running under program control, manual operation is possible via a pulse handle that micro-positions the arm.

A longer and more powerful robotic arm, Armroid Type 2, will be integrated into an

Okuma Multus B250II multi-tasking lathe for high mix, small batch billet work. It is capable of handling workpieces up to 10 kg and possesses a fourth end effector with a 3-jaw workpiece hand.

There will be a second Multus machine on show, a U4000 2SW with an opposed spindle. It will be set up to demonstrate the ease, efficiency and cost-effectiveness of power skiving for the production of external and internal gears and splines to world-leading accuracy on a generic 5-axis multi-tasking platform. It is made possible by the robust machine construction and high levels of accuracy and repeatability combined with leading-edge software.

The process is intended for producing gears from solid billets in large volumes using a dedicated skiving tool to sequentially rough and finish each type and size of gear. Even with deep tooth profiles, a Class 6 spur gear can be achieved due to accurate synchronisation of tool and workpiece rotations. Other gear production techniques are also possible, including hobbing, shaping and spiral bevel milling.

The final turning machine on the stand will be a Genos L2000 with a gantry-type workpiece load/unload system. Production of a flange-type component will be demonstrated.

The Genos M460V-5AX vertical machining centre with a working volume of 762 mm x 460 mm x 460 mm, was launched at MACH 2018. It was the first 5-axis machine in Okuma's popular Genos entry-level range but has since been joined by the larger M560V-5AX with 1,050 mm x 560 mm x



460 mm travels. Both machines are designed to manufacture high precision parts at impressive metal removal rates in a compact footprint.

Formed in 1964, NCMT operates from three strategically located sites in the North, Midlands and South of England. It delivers high technology engineering solutions for metal cutting and grinding applications in the UK and across Europe, from stand-alone machines to complete production lines involving a high degree of automation. NCMT tends to specialise in the more demanding fields of engineering that are avoided by companies that just deliver a machine tool and little else.

NCMT prides itself on its technical competence, innovative production solutions and reliable technology, based on some of the best machine tool platforms available anywhere the world. Its own agency ranges of tool setting, tooling, workholding and shop floor diagnostic products often form part of the turnkey systems we supply. The business is all about satisfying customer demand, so responsive engineering support, training and back-up forms a core part of the NCMT service, from pre-sales through installation and commissioning and for the lifetime of the installation.

In 2006, Makino-NCMT Grinding Division was established to market Makino machines configured for VIPER grinding of nickel alloys throughout the whole of Europe, principally within the aerospace and power generation industries, but also in the motorsport and medical sectors.

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# UK manufacturer builds on Star

Latest machine investment slashes process time by 60 percent and reduces several operations down to one

Axminster Tools has established itself as a market leader in the mail order tools and machinery industry, having supplied premium quality products throughout Europe for over 45 years. This family-built business based in Devon has a proud heritage of UK manufacturing operations and has recently invested in a new sliding headstock lathe from Star GB to expand upon its already impressive array of machines.

Boasting steady year-on-year growth through product innovation, competitive pricing and a commitment to customer satisfaction, Axminster's management recently decided to further enhance their business by investing in its manufacturing processes. The upgrades would allow the company to become more efficient, increase productivity and open new opportunities to develop its product range.

With an SR-32J and SR-38 Type B from Star already on-site and a relationship with the machine tool supplier dating back over five years, Axminster's supply chain director, Andrew Parkhouse, had no question of where to place his trust for guidance on their latest project.

The project focused on a chuck jaw for a woodturning lathe, originally produced locally in small quantities over 30 years ago. As demand increased, the company began sourcing the parts overseas to cope with growing volumes but were faced with quality concerns, leading Axminster to bring the component back in-house where it has since remained for several years.

With production demand in the region of 25,000 units per annum and current methods of manufacture requiring five operations including milling, grinding and finishing, the company challenged Star to produce the jaw in a single operation.



Star's applications team were confident the project was well-suited to a sliding head lathe and set about selecting the ideal machine for the job. Star was then able to provide a competitive cycle time estimate which would allow Axminster to produce the components more efficiently and increase profitability.

The advanced capabilities and flexibility of the Star SV-38R made the machine a firm favourite for the project. Axminster commissioned a turnkey package and began building an extension to their facility to accommodate the new machine upon completion.

The high-specification machine chosen combines the fast processing ability of a traditional platen-type sliding head lathe with the flexibility of a turret machine to enable simultaneous machining operations. The turret allows for a substantial number of tools to be mounted and includes an independent Z3 axis, enabling two different features to be machined at the same time using Star's 'super-position' control mode.

Through combining the machine's balanced milling capability, specialist tooling up to 75 mm diameter and comprehensive process development, the final manufacturing time was reduced by 60 percent in comparison to the existing method. In addition to a faster cutting cycle, the component quality has also significantly improved as a result of 'one-hit' machining, reducing the process down from the previous five operations.

Andrew Parkhouse says: "The SV-38R is a significant investment and we are confident that it will allow Axminster to progress to the next level. The machine will solely run these parts for the majority of its service. However, we highly value the additional capabilities it gives us to develop other products in the future.

At present, the machine also significantly frees up capacity on our other machines to truly maximise the machining potential of our business. There are exciting times ahead for Axminster and we can't wait to further reap the benefits of our continued investment in Star and its technology."

Following the successful pass-off and delivery of the new machine, Axminster's



engineers underwent programmer training in Derby followed by on-site setting and operation training. Included in the package was Star's programming software, PU-JR. This editor makes programming the three-channel machine more efficient, allowing Axminster's setters to generate complicated programs quickly and easily.

Andrew Parkhouse continues: "Our machinist, Marika, is particularly excited about the new machine. She has been with us a relatively short amount of time but took a liking to the Stars very early on. She joined us with little machining experience but is now operating, setting and programming all our machines. With Star's help, she will be up to speed with the SV-38R in no time."

Moving forward, Axminster is forecasting continued growth with an ongoing investment strategy to keep pace the fast-moving industry it supplies. The company and its employees have consistently been nominated and won several awards for its customer service, alongside recently achieving high rankings on major consumer choice platforms in its business category.

For further information on Axminster visit [www.axminster.co.uk](http://www.axminster.co.uk) or to learn more about Star technology, contact:

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# Protect your machines with Kraft & Bauer

### New automatic bottle weighing systems

Kraft & Bauer, whose automatic fire extinguishing systems are fitted to all kinds of machine tools, offers a complete range of systems from small 5 kg CO<sub>2</sub> based models to protect the smallest of machines up to huge multi cylinder variants having multiple 50 kg bottles.

One popular option is to have the CO<sub>2</sub> or argon gas cylinders contained within its own stand-alone cabinet that can be bolted to the factory floor and/or placed directly against a machine. These may be optionally equipped in the case of using CO<sub>2</sub>, as the fire extinguishing media, with automatic weighing systems. These monitor the weight of the CO<sub>2</sub> cylinder and, in case it is empty, will not allow the machine to be run, thus providing added protection.

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

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



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

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



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

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

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

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



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# ROCOL makes 'the best' even better with new fluid technology

When it comes to hand-applied lubricants, the Rocol RTD® family of cutting lubricants has, and will always be, 'the original and still the best.' For a product range to have been available for generations, and still be the industry leader is testament to the advanced technology in the Rocol RTD fluids, compounds and sprays.

Regardless of its industry leading position, a company like Rocol doesn't rest on its laurels. The development engineers and expert chemists at the Leeds-based company have taken the 'best' and now engineered it to create the new Tri-Logic® series. With the arrival of the new Tri-Logic series, Rocol has now enhanced its industry leading RTD (Reaming, Tapping & Drilling) range of cutting technologies. The evolution of the Tri-Logic series demonstrates Rocol's commitment to its continuous improvement programme. Working in close cooperation with its customer base across all industry sectors, Rocol has paid meticulous attention to detail regarding the evolution of machine tool and cutting tool advancements as well as the ongoing material technology advancements.

The hand applied metal cutting lubricant Tri-Logic RTD Liquid is a viscous fluid containing extreme pressure additives for use in reaming, tapping, drilling and other metal cutting operations. Tri-Logic RTD is suitable for all metals including hardened steels, titanium, nimonics and all grades of aluminium alloys, significantly reducing friction to give superb cutting performance. Despite the exponential uptake in CNC technology in the last 30 years, hand applied liquids are as pertinent now as they have ever been.

ROCOL's marketing communications manager, Shaun Heys says: "Whether manufacturers are adopting manual or CNC machining, RTD® Liquid is still playing a critical role for engineers that are conscious of the quality and consistency of their holemaking and threading operations and also the performance and longevity of their cutting tools. The RTD family of products have been formulated specifically for the holemaking and threading process and standard cutting fluids cannot compare in terms of performance."

"With the addition of the Tri-Logic technology to the RTD family, Tri-Logic RTD Liquid can also be added to ordinary mineral cutting oil for the most severe cutting operations, such as broaching and gear cutting on the toughest metals. The RTD® range contains technically advanced extreme pressure additives that significantly reduce friction at the cutting edge, giving superb performance. The incorporation of Tri-Logic RTD technology ensures the fluid will not contaminate existing cutting fluids in the machine sump and in fact enhances the cutting performance further."

The Tri-Logic RTD fluid has been developed with anti-microbial properties, so commonly found coolant sump bacteria will not identify the RTD Tri-Logic fluid as a food source. This quality in the Tri-Logic RTD fluid helps to significantly reduce coolant degradation often caused by excessive tramp oil. This prolongs coolant life, reduces fluid costs and minimises the potential for bacterial growth and the associated health and skin conditions suffered by users of water mix cutting fluids.

Furthermore, the medium viscosity Tri-Logic RTD fluid has been developed with



several Extreme Pressure (EP) additives that generate an 800 kg weld load resistance. For the end user, these technically advanced additives are the primary reason that Rocol's Tri-Logic RTD fluid can outperform regular cutting fluids.

As the recognised market leader for over 60 years, the RTD family of products and in particular the Tri-Logic series of RTD liquid provides the ultimate cutting performance and excellent surface finishes whilst more than doubling tool life, reducing tool wear and tap breakages, minimising waste and scrap, reducing friction and increasing wear resistance whilst offering unparalleled extreme pressure performance.

The original and still the best' Rocol RTD liquid is available in bottles and containers from 400 ml, 5 litre and 20 litre up to 200 litre, while the Tri-Logic RTD liquid is available in 350 ml, 5 litre and 20 litre quantities. As the 'must have' product for all machine shops, tool rooms and maintenance departments, Rocol has also developed sulphur and chlorine free versions of the industry leading fluid.



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# Wogaard and Eclipse Magnetics launch green solution to maximise metalworking fluid

The expert in coolant saving solutions Wogaard has joined forces with high performance magnetic filtration specialist Eclipse Magnetics to launch a revolutionary, environmentally friendly solution to maximise coolant and oil during manufacturing.

The new MagSaver Kit combines Wogaard's award winning coolant saver with Eclipse Magnetics' compact magnetic filter, the MicroMag, to save up to 50 percent of coolant and oil, and clean it at the same time. The Coolant Saver from Wogaard automatically reclaims coolant dragged out into the swarf bin from the conveyor while the machine is in operation, whilst the MicroMag compact magnetic filter with high collection capacity removes fine particle ferrous contamination.

Wogaard Ltd managing director, Jason Hutt says: "We are really pleased to announce this new exciting collaboration. Our products work together fantastically well to reduce the environmental impact of the manufacturing process and significantly reduce disposal costs. By minimising waste and fluid disposal, the MagSaver kit can also contribute to ISO 14001:2015 compliance, helping companies manage their environmental responsibilities."



Nigel Hampson, sales manager at Eclipse Magnetics says: "The MagSaver kit is a great way to significantly extend fluid life, not only increasing productivity and saving money but helping the environment too. The addition of the MicroMag magnetic filter to the coolant saver effectively ensures that almost 100 percent of ferrous contamination is removed from the fluid, therefore cleaning your main machine's reservoir and improving coolant quality and life."

The MagSaver kit minimises coolant disposal costs by up to 90 percent, significantly extending fluid life without the need for consumables. In addition to 24/7 operation and minimal running costs, this fit and forget solution ensures cleaner fluid, therefore minimising health and safety risks through exposure to contamination.

The maintenance of metalworking fluid is essential to prevent ill health in machine workshops. In accordance with HSE and COSHH guidelines, magnetic filtration is an effective way to maintain metalworking fluids by reducing contamination, minimising microbial growth, decreasing the need for biocides, and reducing cleaning risks. The latest restriction on biocide use means that the maintenance of metalworking fluids is now even more important; contamination including swarf metal fines can increase the risk of microbial growth, making its effective removal an absolute must.

For more information on how the MagSaver Kit can help you prolong the life of your fluids, visit [www.wogaard.com/magsaverkit.html](http://www.wogaard.com/magsaverkit.html)

Christian and Preben Woergaard launched Wogaard with the unique and innovative Coolant Saver product with a focus on cost cutting and optimisation for the manufacturing industry. Both have vast experience in the industry from design to maintenance and noticed the coolant wastage produced by CNC machines and the impact on companies in both costs and environmentally. The team then went to work and designed a innovative product to reclaim this wastage, using the machines



wasted power to operate the unit so avoiding additional energy usage and cost.

Primary customers for Coolant Saver are CNC machine shops, of all sizes, that are constantly looking to improve their competitive edge and reduce any impact on the environment from day-to-day manufacturing processes.

Wogaard has focused on working with good technical distribution partners globally and is stocking in UK, USA, Denmark, Australia and this list is growing.

Nearly 5,000 units have been supplied and installed in machine shops across the world and new products, including the Oil Saver typically for Swiss-type sliding head lathes, have been introduced.

With 100 years of experience in the design and manufacture of high performance magnetic systems, Eclipse Magnetics supplies critical equipment to some of the leading names in the most demanding industries. Its magnetic technology is widely used at leading worldwide companies and in major development projects, all requiring a guarantee of equipment performance. All manufacturing is carried out under an ISO 9001 quality management system and appropriate industry directives.

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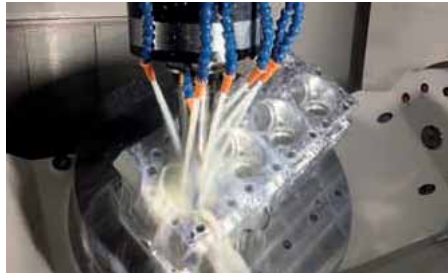
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# High quality metalworking fluids

Hangsterfer's Laboratories Inc specialises in the research, development and manufacture of a full range of advanced metalworking fluids. This includes emulsifiable oils, semi synthetics, synthetics, cutting oils, drawing compounds and machine lubricants.

Today's global marketplace environmental compliance is more important than ever. Hangsterfer's does not formulate products with boron/boric acid, formaldehyde, secondary amines or other harsh chemicals. Its lubricants are completely free of hazardous pictograms under the new Globally Harmonised System (GHS).

All Hangsterfer's products are also compliant under the EU's Regulation Evaluation Authorisation and Restriction of Chemicals (REACH). Lubricants are a commonly overlooked but essential part of the manufacturing process. Surface integrity is one of the biggest challenges in manufacturing that can be improved by advanced cutting fluids. Another challenge is improving tolerances. However, both these challenges can be overcome with Hangsterfer's advanced technology fluids.



All Hangsterfer's Advanced fluids are formulated to be high performance, non-toxic and non-hazardous, as well as easier to clean and reducing consumption. Hangsterfer's advanced lubricants are the answer to improving efficiencies in all manufacturing industries.

New regulations are forcing coolant manufacturers to label their products to tell you hazardous ingredients are included. Under these new stringent regulations Hangsterfer's coolants do not require any hazard warning labelling.

Hangsterfer's high quality lubricants hold many aerospace approvals as well as being widely used in the medical industry.

5070 coolant is mineral oil free which helps to reduce the droplet size making it an

ideal choice for VIPER grinding and cutting trials found it to be outstanding when machining titanium alloys.

Some of the most difficult to machine materials are found in the aerospace industry. Alloyed titanium and nickel alloys create the biggest challenge and, although Hangsterfer's 5080 coolant was more than up to the task, two new products have been introduced. 5090 is an even higher performing version, containing environmentally sustainable vegetable oil chemistry.

Certain lubricant additives can solve issues with surface integrity by filling in the gaps, micro cracks and dislocations in fresh surfaces. Additionally, advanced lubricants are better able to regulate surface temperature at the toolworkpiece interface, substantially improving tolerances in precision machining.

#### UK Distributor:

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- ▶ Reduce tooling costs and breakages
- ▶ Increase productivity
- ▶ Minimise the risk of workpiece rejection and scrappage

## FUCHS set to launch new cutting and grinding fluid

When it comes to improving tool life and performance, there are few things more important than lubrication.

Using specialist high-performance lubricants and using them properly has been proven to increase tool life by up to one-and-a-half times. Multiplied over many expensive tools, that can add up to a significant operational saving.



FUCHS Lubricants' water-miscible cooling lubricants in the ECOCOOL range are exceptionally durable and economical in terms of consumption. Thanks to their excellent lubri-cating properties, they achieve extremely high machining and cutting performance.

There are more than 10 products in the ECOCOOL range for a variety of functions.

FUCHS is set to unveil a new member of the product family, ECOCOOL GLOBAL 20 a globally approved water miscible cutting and grinding fluid for automotive component manufacturers.

Alex Holmes, UK industrial product manager, says: "Customers have reported up to 43 percent reduction in tooling costs when using the latest ECOCOOL 'Global' platform with existing tooling. Greater savings can be realised when tools are optimised for the process. In other studies, tool life increases of up to 150 percent have been recorded.



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

"We are looking forward to lifting the lid on our latest product: ECOCOOL GLOBAL 20. This is set to be the most innovative fluid yet to be introduced into the market.

"Our experts will be on hand to discuss this new OEM-approved product as well as our comprehensive range of metalworking process fluids and services."

On top of industry-leading products, FUCHS also offers quality monitoring services thanks to the introduction of its innovative Fluids Live system.

Already utilised by more than 100 companies globally, many of which are based in the UK, FLUIDS LIVE is an easy to navigate web-based recording, tracking and reporting tool with integrated KPI measurements.

In short, the system can be the key to unlocking a successful maintenance strategy, with real time data providing immediate and remote access to data showcasing the current condition of fluids in use.

Within two hours of the collection of data under Fluids Live, information can be updated and production professionals able to make informed decisions on maintenance scheduling, production planning and other operational activities.

Alex Holmes says: "The feedback we are getting back from the customers who are utilising FLUIDS LIVE is extremely positive.

"It helps determine which machinery is working most effectively and highlights any that are not functioning to their capacity.

"We use our own internal department to design the software and produce bespoke versions for each customer, some of which can be set up in a matter of days.

"We will provide the optimum lubricants settings for operators which best suit the needs of our customers, giving real flexibility to the many different maintenance management packages available.

"The whole idea is to obtain information from measurements such as oil sampling and vibration monitoring and to ensure asset care is being maximised. It's all



designed to cater for increasing skill shortages and to take the guess work away, resulting in a hugely significant saving for manufacturers.

"Using the data in the right manner will allow for improved inventory control, reduced and simplified waste management activity and accurate analysis of fluid consumption by any machine, cell or process."

For an average production facility, lubricant purchases normally amount to only three percent of a maintenance budget, but lubrication-related activities can influence an estimated 30 percent of total maintenance costs, highlighting how crucial this process can be.

FLUIDS LIVE is constantly evolving, with recent innovations including the development of an API to enable the live measurements to be recorded on a customer's data boards. Increasingly sophisticated recording procedures are also set to be introduced soon.

FLUIDS LIVE customers are encouraged to work closely with the FUCHS Lubricants UK team to ensure trend data is best presented in a format that suits the organisation.

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# Effortless manufacturing, even at high pressures

rhenus TS 421 coolant ensures improved performance thanks to minimal foaming

Manufacturing processes in metalworking are increasingly subject to high pressures. This represents new challenges for coolant developers. Not only are high-performance fluids required but also low-foaming fluids in particular. The more foam there is, the worse the performance. With rhenus TS 421, coolant expert Rhenus Lub has developed a coolant that virtually generates no foam at all at high pressures.

**Improved cooling and lubricating effect**  
rhenus TS 421 can be used for the most common machining and grinding processes and is one of the lowest foaming products on the market. "Our users therefore benefit from excellent cooling and lubricating properties, even at high pressures," explains Daniele Kleinmann, director of product management for coolants at Rhenus Lub.

Thanks to the innovative formulation, the foam level is close to zero from the outset. This opens up new possibilities for manufacturing companies. For example,

even very soft water, which often causes significant foam build-up, can be used without any problems. rhenus TS 421 thus offers the best possible starting point for optimal processing and maximum process safety, even with unfavourable levels of water hardness.

**Resistant and economical**  
Modern manufacturing also means economical manufacturing. rhenus TS 421 has everything needed for cost-optimised production. Besides steel and cast iron, all common aluminium alloys can be machined. Its exceptional rinsing properties improve the workpiece output and keep tools and machines clean. The extremely stable formulation not only significantly reduces maintenance requirements, it also makes the manufacturing process safer. This allows users to keep their costs under control and even lower them demonstrably.



rhenus TS 421 makes metalworking effortless even at high pressures

Despite its impressive resistance, rhenus TS 421 contains no critical components such as secondary amines, ensuring trouble-free machining in every respect.

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# Advanced geometry for even more materials

### Sandvik Coromant launches optimised multi-material drill



Global leader in metal cutting, Sandvik Coromant has launched the latest addition to its CoroDrill® 860 range. The CoroDrill 860 has an advanced -GM geometry that offers high-performance drilling across a wide range of materials and applications, as well as significantly improved tool life.

The new launch stems from one of the most popular product ranges from Sandvik Coromant, the R840. Currently, the R840 is the largest selling drill in the business's solid round tools offering. However, new advances in drilling technology, and customers' needs to improve and better maintain their productivity, meant that it was time for an upgrade.

The CoroDrill 860 with -GM geometry features a new grade, innovative flute design with a multi-layer physical vapour deposition (PVD) coating on the drill tip. The results are improved drilling capabilities across a range of materials and applications, including general engineering and automotive, with a much greater tool life than its predecessor, the R840.

One of the most innovative qualities of the drill is its advanced geometry, with the

double margin adding stability, increased core strength and reinforced corners all of which contribute to process security and finished hole quality. The flute is highly polished, which helps improve chip evacuation and reduces heat build-up during the drilling process.

The advanced geometry of the CoroDrill 860-GM makes it ideal for use with a variety of materials, including steel, stainless steel, cast iron and hardened metals. It also performs competitively with non-ferrous metals, such as copper and aluminium, and heat resistant super alloys.

James Thorpe, global product manager at Sandvik Coromant, says: "Sandvik

production costs, with greater machine flexibility and reduced setup times.

"With the new addition to the CoroDrill 860 family, we hope to target a greater variety of industrial sectors while continuing to offer even more possibilities to our existing customers."

The CoroDrill 860 with -GM geometry was launched globally on 1 March 2020. For more information on the product, visit: [www.sandvik.coromant.com/en-gb/products/corodrigill\\_860/](http://www.sandvik.coromant.com/en-gb/products/corodrigill_860/)

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry



Coromant provides machining solutions for a multitude of industrial sectors. We are always improving our offering and understand that enhanced tool life and improved productivity are two of our customers' major requirements. The CoroDrill 860 with -GM geometry is suitable for applications where hole quality is critical within the automotive, general machinery and oil and gas industries.

"We wanted to offer an improved solution for a vast range of industrial applications, and also to streamline our product offering," he adds. "We've achieved this with a single, multi-purpose drill that gives superior performance across a range of materials. As well as improved drilling quality for our customers, they can also reduce their tooling inventory and overall

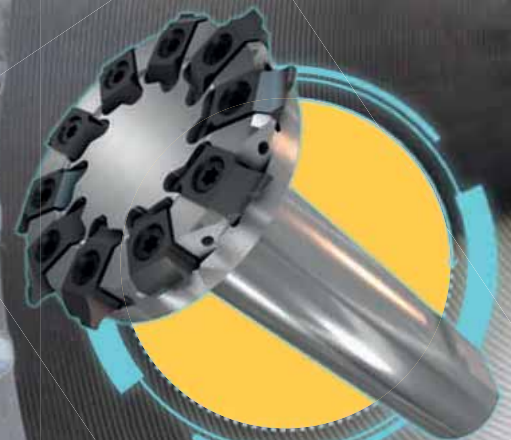
standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3100 patents worldwide, employs over 7,900 staff, and is represented in 150 countries.

For more information, contact:

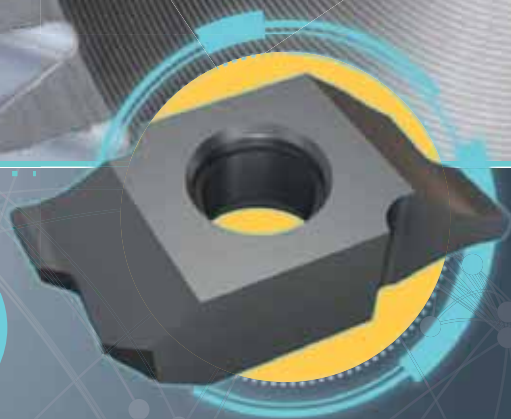
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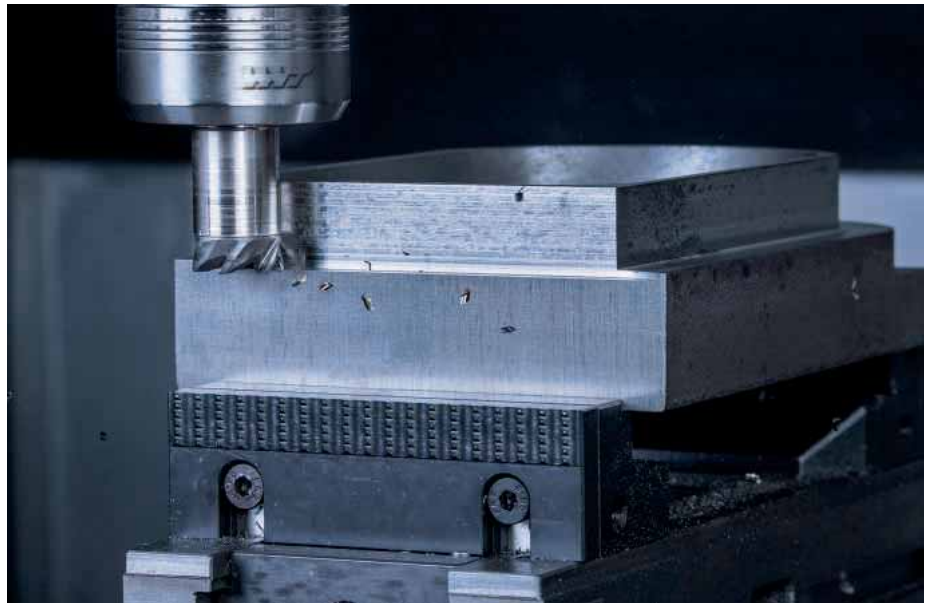
# Reducing tool costs, increasing performance

Exchangeable head milling systems are a fairly familiar sight, thanks to the cost savings that they deliver over conventional solid carbide milling cutters above a certain diameter. However, to achieve optimum performance, close attention has to be placed on the connection between holder and cutter head. Here, CERATIZIT has achieved the highest level of performance using a unique interface technology for its new MultiLock system.

The MultiLock exchangeable head system from CERATIZIT makes use of a precision sintered interface with a patented 'Captive Pocket', guaranteeing the highest level of stability and performance. The precision sintered, form-fitting, interface ensures maximum rigidity for optimum power transmission, while enhancing process security and by default extending tool life. Further benefits of this form-fit connection are that axial and radial run-out accuracy of 0.02 mm is achieved, while the combination of carbide head and steel body has excellent vibration-damping properties to ensure improved surface finish.

MultiLock targets applications such as those found in mould and die, aerospace, and hydraulics sectors where complex contours are required or, when difficult to machine materials are common. Using conventional solid carbide tools as the diameter increases so do costs. The MultiLock exchangeable head system reduces these costs and also lowers the environmental impact through reduced use of carbide material. The ability to use one steel holder in conjunction with multiple carbide heads further reduces the investment required by the end-user and provides added flexibility into the manufacturing process. The latter is enhanced by the multiple choice of milling heads available, including high feed milling cutters, torus cutters and radius cutters in diameters from 12 to 25 mm, while 45° deburring milling cutters are available in diameters of 12 and 16 mm.

The HFC and torus heads are screwed to the front of the holder through a hole in the exchangeable head, making it possible to swap the heads quickly and reducing unnecessary machine downtime. Additionally, a variety of screw-in adapters add even greater flexibility to the MultiLock system.



The MultiLock exchangeable head milling system

Customers have the choice of two innovative carbide grades (CTPX225 and CTC5240) with proven cutting geometries that cover the majority of applications, both of which make use of CERATIZIT's state-of-the-art Dragonskin coating technology to deliver all round excellent performance. The PVD coated CTPX225 is a reliable fine grain carbide grade whose toughness lends it to universal use, while CTC5240 has a TiB2 based coating making it suitable for machining titanium and titanium alloys.

Analysis from customers shows that these grades deliver excellent service life and chip volumes, in one case when machining tool steel a 310 percent higher chip volume could be produced than with comparable competitor products, with tool life increasing from 14 minutes to 92 minutes.

"MultiLock meets a specific need in the market and brings certain cost and environmental advantages over solid carbide milling cutters, especially in applications where longer reach is required. Cutting data is improved by virtue of the increased number of cutting edges that can be introduced, and with those cutting edges being generated by the precision sintering technology costs are also reduced, giving MultiLock a distinct advantage in many applications," says Adrian Fitts, business development manager, CERATIZIT UK & Ireland.

The MultiLock exchangeable head system

from CERATIZIT is featured in the latest the Up2Date catalogue ([https://cdn.plansee-group.com/is/content/planseemedia/en\\_9902200238\\_up2date-01-2020\\_pim](https://cdn.plansee-group.com/is/content/planseemedia/en_9902200238_up2date-01-2020_pim)).

You can find further information and a product video on MultiLock at <https://cuttingtools.ceratizit.com/gb/en/multilock>

For over 90 years, CERATIZIT has been a pioneer in the development of exceptionally hard material products for cutting tools and wear protection. The privately owned company, based in Mamer, Luxembourg, develops and manufactures highly specialised carbide cutting tools, inserts and rods made of hard materials as well as wear parts.

With over 9,000 employees at 34 production sites and a sales network of over 70 branch offices, the group is a global player in the carbide industry. As a leader in materials technology, it continuously invests in research and development and holds over 1,000 patents. Seven competence brands include Hard Material Solutions by CERATIZIT, Toolmaker Solutions by CERATIZIT, as well as Cutting Solutions by CERATIZIT, KOMET, WNT and KLENK.

**CERATIZIT UK & IRELAND Ltd**

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Our unique geometry provides an excellent cutting process with efficient swarf control. Tools are designed in-house for specific applications and can incorporate multi-flute tools with material-specific geometry for optimised tool and tool path operation. And because it has a ballnose as well as the barrel profile, you get two tools in one.

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#### Aerospace blisk

#### Component information

- Material: aluminium alloy
  - Cutting speed VC: 850 M/min
  - Step down\*: 3mm
  - Cycle time: 80% reduction compared to ballnose
- \*Step down is relevant to the RA finish required and is assessed by our strategic technicians*

#### Key benefits

- Far better cutting conditions for the tool
- Cutting on the flank rather than the ballend
- Cutting speed maintained over feature
- Longer tool life



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carbide tooling



# Milling innovations from Guhring

Birmingham-based Guhring is demonstrating its milling expertise with the arrival of a multitude of next generation cutting tool innovations. The globally recognised manufacturer will be introducing its new RF100 5-Speed and RF100 7-Speed solid carbide end mills alongside a number of established industry leading milling tools.

Developed for the machining of very tough materials, the new RF100 5-Speed and RF100 7-Speed solid carbide end mills take cutting speeds and process reliability to a new level. The increased tooth number of the five-fluted 5-Speed and seven-fluted 7-Speed generate high metal removal rates with stable process reliability, even when processing the most difficult-to-machine materials. Providing high-performance roughing even at high cutting depths, the two new ranges maximise feed rate parameters during large metal removal rates. As part of the highly dynamic Guhring Trochoidal Cutting (GTC) series, the new RF100 5-Speed and RF100 7-Speed are perfect for machining tough stainless steels, special alloys and a wide variety of steel and cast-iron grades.

At limited machine speeds or cutting speeds limited by the material, the RF 100 5 and 7-Speed ensure high feed rates and long tool life thanks to the increased number of teeth. The new arrivals are particularly suitable for difficult-to-machine materials under stable conditions and they can conduct trochoidal cutting at an ae rate of up to 10 percent.

The optimal cutting conditions for the RF 100 5-Speed is applications on all tough materials up to 1200N/mm<sup>2</sup> and where a ramping angle of up to 10° is required. The new innovation is also perfect for slotting with cutting depths up to 1XD and helical



milling. The RF 100 7-Speed is also the perfect choice for tough materials up to 1400N/mm<sup>2</sup> and the seven fluted variant is also ideal for helical milling at in-feeds of up to 0.05XD ap per cycle. From a dimension perspective, the new RF 100 5 and 7 Speed are available with cutting diameters of 6, 8, 10, 12, 16 and 20 mm with a necked diameter that permits cutting depths from 20 to over 60 mm depending upon diameter selected.

Also in the Guhring milling stable is the new Ratio<sup>®</sup> line of roughing end mills. With flat crested geometry and an optimised roughing profile that demonstrates 60 percent longer service life, the new Ratio high-performance roughing cutter has several geometry adjustments aimed at providing performance far beyond competitor products. The Ratio drastically increases material removal rates with its asymmetrical cutting flutes that reduce cutting pressure compared to smooth cutters. This soft cutting action allows the Ratio to perform exceptionally well on low powered machine tools or machines with unstable fixturing. Large flutes ensure optimum chip removal and high process reliability.

Guhring Ltd is a world class manufacturer of precision cutting tools and allied tooling for the engineering and manufacturing industries. Whether tools are selected from the vast standard, stocked Guhring range or manufactured to suit customers specifications then all can be supplied from leading tool distributors throughout the UK and Ireland.

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# Walter Cut DX18 adds to a new era of Walter grooving and parting off tools

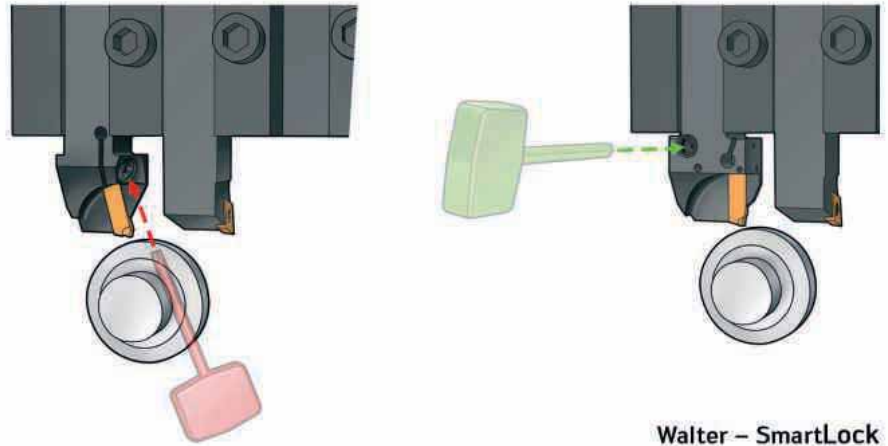
Tooling expert Walter GB has announced the new Walter Cut DX18 double-edged grooving and parting off system that, with innovative lateral clamping, will set new standards in parting off on turning machines and especially Swiss-type autos and multi-spindle machines.

The new tool is the latest addition to Walter's ever-expanding grooving and parting off range that offers users increased tool life and high process reliability in the quickest cycle times.

Suitable for parting diameters of up to 35 mm, DX18 features a positive engagement system. The insert geometry lends itself to being locked securely, compared to conventional screw clamping where the characteristics of the cutting forces, for parting off, mean that the existing clamping forces are insufficient, with negative effects on machining quality and process reliability.

Another innovation with the Walter Cut DX18 is the use of the SmartLock system in the G4014 toolholders which simplifies insert changeover. Rather than having to remove the entire tool, often in cramped and 'oily' machine conditions, SmartLock's insert clamping screw is changeable to either side of the tool for easy and quick insert change, with a blanking plug provided to protect the unused side. Thanks to the positive engagement, a new insert, even those of very narrow width, will always locate correctly.

The potential of the system has been successfully proven in tests on a Swiss-type automatic, where the customer particularly liked not having to remove the tool for insert changing. An outer diameter of 12 mm was parted off from 1.4057 high tensile martensitic stainless steel and the



cutting-edge width used was 2 mm. DX18 more than doubled tool life compared to the single-edged alternative with maximum process reliability and productivity.

Walter GB reports that DX18 is the latest addition to an ever-expanding Walter range of grooving and parting off tools to meet rising demand, especially in mass production.

The trend towards miniaturisation of even more complex component geometries is one of the driving forces for Walter's ever-evolving range for tasks, where users consider an alternative only when there are problems with process reliability or when machining strategies are changed.

This, says Walter GB, is where its Walter Cut portfolio consistently scores in terms of productivity levels and cost advantages, cycle times, tool life and process reliability.

Typical problem areas, especially for machining operations when grooving deeper into the workpiece, are the stable fixing of the indexable inserts, chip breaking and cooling. So, users often play it safe by reducing cutting data below recommended values. It is in such applications, adds Walter GB, where the Walter Cut range can make the difference.

Walter AG was founded in 1919 and is now one of the world's leading metalworking companies. As a provider of



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

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## New tooling system provides speed and accuracy

Dormer Pramet has launched a high precision, quick-change tooling system for a variety of internal and external turning applications.

Ideal for use on multi-task machines, the polygon shank coupling (PSC) is a spindle interface which promotes higher productivity through reduced setup time and faster, more precise machining. It achieves this with a unique tapered polygon cone shank and flange surface, which supports a high degree of rigidity. With an accuracy in X, Y, Z directions of  $\pm 2 \mu\text{m}$ , the PSC holders provide a high level of repeatability.



In addition, a reduced overhang length minimises vibration and runout inaccuracy for a high-quality surface finish, making it ideal for aerospace and general machining applications. Connected by a triangular conical structure and cross section, which uses 1/20 taper, the PSC features internal coolant channels and a steel toolholder for high toughness.

More than 130 different items are available, including a variety of tool holder styles, internal tools, interface types and shank sizes.

Dormer Pramet is a global manufacturer and supplier of tools for the metal cutting industry. Its comprehensive product program encompasses both rotary and indexable drilling, milling, threading and turning tools for use in a wide variety of production environments. An extensive sales and technical support service operate from 21 offices, serving more than 100 markets worldwide. These are assisted by dedicated production facilities in Europe and South America and a highly developed distribution and logistics network.

For more information regarding all the latest products launched by Dormer Pramet please visit [www.dormerpramet.com](http://www.dormerpramet.com) or contact your local sales office. Follow all the social posts regarding the new assortments by searching for #EverydayProductivity.

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# The latest gripping news from Leader

**Leader rings the changes with RotoRi**

Tamworth-based workholding specialist, Leader Chuck Systems has recently expanded its product portfolio with the addition of the RotoRi range of chuck jaw boring rings. Able to precisely support the 'truing' of jaws fitted to manual or power chucks the RotoRi sets have been specifically designed to be used to bore, turn or grind jaws very accurately under a clamping pressure that reflects that required to hold the workpiece.

Available in seven standard sets designed to match the diameter range of the machine tools on the shopfloor as well as the types of chucks used, these multiple-patented innovative ring sets allow precise machining of the jaws thanks to the complete adjustability of the segments.

Creating perfectly concentric bores on hard or soft jaws, the RotoRi boring rings allow fine adjustments for minimal skimming of jaws, so only the minimum amount of material from the jaw face ever needs to be removed maximising the life of the jaws. As they can be through bored in one operation it results in better T.I.R (total indicated run out) for any subsequently machined parts. The patented curved segments support easy readjustment of the clamping diameter which saves both time and tool costs.

Managing director, Mark Jones says: "Every machine shop that has to regularly set up chucks for the production of accurate components can benefit from the advantages these ring sets offer. First, the precision adjustment saves jaw usage as only fine skims are required to achieve the accuracy required; secondly it reduces the time wasted looking for, or making, turning clamping rings; and, finally, one RotoRi set can be used to support many chucks."

Made from high-tensile steel, the RotoRi sets range from 10 to 52 rings for chuck up



to 1,200 mm diameter. For 3-jaw chucks each ring consists of three curved segments (3 x 120°) that can be used both on the internal and external diameter of the jaws to support OD and ID workholding.

For 2-, 4- and 6-jaw chucks Leader recommends the RotoRi-Quattro sets with four (4 x 90°) or RotoRi-Six with six segments (6 x 60°).

**Orange Vise: A juicy addition to Leader's workholding range**

The Orange Vise range of high-quality precision vices from America is now available in the UK exclusively from Leader Chuck Systems. Thoroughly engineered to deliver maximum clamping force and repeatability with quick-change features

the vice it is either machined or ground and then selectively powder coated. The screw is sealed so that no threads are ever exposed to chip or swarf ingress.

Dual station vices can also be quickly converted into single station vices without any additional hardware. This flexibility is also applied to the 6- by 16-inch single station vice as double station conversion kits are available. Similar in design to the dual station vices but without a centre jaw, the fixed jaw is held down securely with an angled wedge from underneath, rather than cap screws from above. This allows unobstructed machining of optional soft jaws.

Available in steel or aluminium the optional low-cost soft jaws feature a greater



throughout, the vices are designed and manufactured in the USA to achieve the ideal balance of performance and longevity. Every vice is covered by a lifetime warranty against defects in materials and craftsmanship.

The range includes 4- and 6-inch dual station and 6- by 16-inch single station vices. The 4-inch dual station vices offer a compact footprint while the larger vice is available in 17.5 and 20 inch lengths. Every dual station model features independent jaw stations, so dissimilar sized workpieces can be clamped with equal force.

Machined from a solid billet of Dura-Bar iron rather than cast to shape there are no rough sand-cast surfaces, every surface of

machinable volume than most other jaws on the market. For additional capacity XL stepped jaws can increase the jaw opening from 12 inch to as much as 18.5 inches on the 6-inch dual station vice. Made of cast iron and compatible with all 6-inch vices, the XL Stepped jaws are said to be far more rigid and repeatable than outboard jaw plates used on typical vice setups.

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# Setup times cut, then reduced again

US-manufactured CHICK System 5 workholding equipment, supplied in the UK through sole agent 1st Machine Tool Accessories, Salisbury, is helping to increase productivity and efficiency in the machine shop of Axminster Tools & Machinery, located in Axminster, Devon.

The company is an online and high street retailer of tools and machinery that it imports from global suppliers. However, it chooses to manufacture some machine accessories, notably jigs and chucks, including the popular Clubman SK80 woodturning chuck, in-house to ensure consistently high quality.

Historically, standard wind-up vices were used to fixture components for machining on CNC mills and machining centres but, as production levels rose, they became too inefficient. Several years ago, a new, still on-going job came along that required particularly accurate clamping of multiple small parts, namely steel jaws for chucks.

Conventional vices were not suitable, as it was impossible to present a sufficiently large number of parts to the spindle. An initial workholding solution was to use a steel fixture plate machined to retain the parts by bolting them individually into position. The problem with that was the two hours it took to change over to produce the next batch.

To provide a solution, 1st MTA proposed its CHICK Qwik-Lok system. It significantly reduced setup times, as the jaws secure components quickly and to high



The Mazak VCN-530C 3-axis VMC in use at Axminster Tools & Machinery

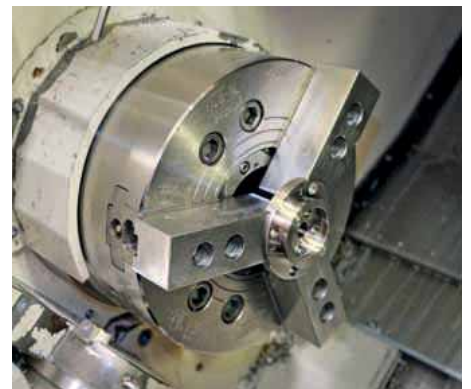
repeatability for milling and drilling. One large part can be clamped between two jaws but to allow more parts to be loaded at a time, more usually a pair of components, or multiples, are held in two stations. Aluminium jaws machined with the profile of the parts to be held ensure they are retained firmly during machining.

Turning a single handle advances the two movable Qwik-Lok jaws simultaneously towards a fixed central jaw to clamp the parts, which also has the effect of cancelling the opposing forces and creating a reliable reference point for machining. A beneficial side effect of clamping more parts faster was a rise in walk-away time, allowing operators to be more productive in other parts of the factory.

Once Axminster Tools & Machinery adopted this procedure, clamping several steel mounting jaws in each Qwik-Lok station, productivity was dramatically increased. The machine operator is able to



Also supplied by 1st MTA to Axminster Tools & Machinery are machinable steel jaws for the chucks in the manufacturer's twin-spindle Mazak turning centres. Here a stainless-steel billet is ready for Op1 machining in the sub-spindle



The component, a dovetail jaw for a woodturning lathe, is transferred to the main spindle for Op2. These 1st MTA jaws have also been machined especially to secure the round parts during production



The two-part CHICK foundation plate fitted to the VCN-530C contains an array of holes 11 deep by 27 across. Here a grooving jig for a router is being produced in three operations by clamping the aluminium component in three CHICK Qwik-Loks

change over up to six Qwik-Loks on a vertical machining centre (VMC) table in half an hour, four times faster than when previously using the bespoke steel fixture plate. Moreover, the latter had the drawback of potentially causing damage to the cutter in the event of a programming error, whereas this is not the case with aluminium jaws.

The machinable soft jaws were soon found to be a versatile solution to other clamping problems, such as how to retain chuck bodies without the risk of the cylindrical components rotating during machining. Again, these parts were previously bolted to a fixture plate, necessitating a half-hour setup time,

whereas now the bodies are swapped in the line of Qwik-Lok jaws in a couple of minutes.

Axminster Tools & Machinery initially decided to mount the units directly onto the machining centre table, but it meant that when a clamp was removed it was time-consuming to realign the unit for a new job. To avoid this, two years ago Jake Knight, head engineer at the Innovation and Manufacturing Department in Axminster, decided to invest in a CHICK foundation plate for two 3-axis VMCs on-site, a Mazak VCN-530C and one of a pair of VTC-200Ms.

Manufactured to suit the size of the machining centre table, the cast iron plates have a grid of accurately drilled holes at 50 mm centres with hardened bushings and threads at each location that allow Qwik-Loks to be positioned anywhere over the surface rapidly and repeatably to an accuracy within 10 microns. The use of round and diamond pins at two positions allows the Qwik-Loks to be located and mounted quickly and easily.

Alpha-numeric labelling of the grid enables unerring relocation of each base and jaw set so that the same program can be used every time a job is repeated. All unused holes in the plate are sealed with



The other CHICK foundation plate at Axminster Tools & Machinery, with an array of 41 x 11 mounting holes, is fitted to one of two Mazak VTC-200M 3-axis VMCs. Here, six Qwik-Loks with machined soft jaws are mounted side-by-side for stainless steel chuck body production

plugs to prevent the ingress of swarf, which could compromise location accuracy.

Jake Knight confirms: "Overall, we use about 20 Qwik-Lok bases and have three times as many soft jaw sets machined to hold a multitude of components that we machine from stainless and other steels through to aluminium and plastics.

"We have chosen CHICK's 1040 base size, with a jaw width of 100 mm and an overall length of 400 mm, as this supports the majority of the components and accessories we produce for the products in our catalogue.



Jake Knight, head engineer at the Innovation and Manufacturing Department in Axminster, removing a finish-machined chuck body

"In another project, 1st MTA also regularly supplies us with machinable steel chuck jaws for our four Mazak turning centres. They are especially useful for clamping various rotational parts to a high degree of concentricity for turning, such as chuck bodies for our woodturning lathes."

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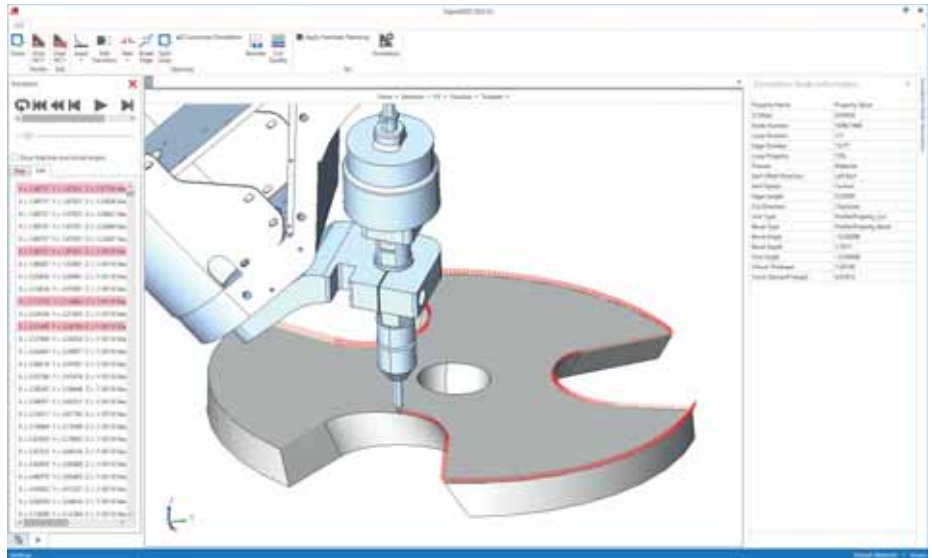
## SigmaTEK launches Version 20 of the SigmaNEST product portfolio

SigmaTEK Systems, a leader in developing CAD/CAM software solutions for the fabrication industry, has announced the latest release of its flagship SigmaNEST product portfolio. Version 20 is a substantial release introducing many new features in all areas of the product with continued emphasis on user experience, optimising material utilisation and data management.

A new SigmaTEK Launcher provides a common, customisable desktop platform from which users can easily access core SigmaTEK products and eco-system applications such as license manager, database utilities, and help resources. The Launcher also displays a live social media feed to ensure users are fully up to date with the latest product information, trade shows, and educational webinar schedules.

SigmaNEST enhancements includes support for part priority nesting, nesting of filler parts and nesting of "mini-sheets" or mini-nests. User efficiency continues to be a focus and a new CAD Import Plus module is available that does not require a local CAD installation to import a variety of file formats, including SOLIDWORKS, Solid Edge, Creo, Inventor, and NX. In addition, SigmaNEST 20 adds feature recognition (drilling, partial-depth pockets, bevel) for STEP files.

Significant profiling enhancements see the introduction of innovative bevel



Version 20 delivers innovative bevel capabilities such as advanced toolpath generation, and rule-based corner transitioning

capabilities such as advanced toolpath generation, and rule-based corner transitioning. Users now can import part files with complex bevels and apply NC directly to the 3D model in an interactive 3D viewer to ensure a safe and accurate toolpath generation and better program verification.

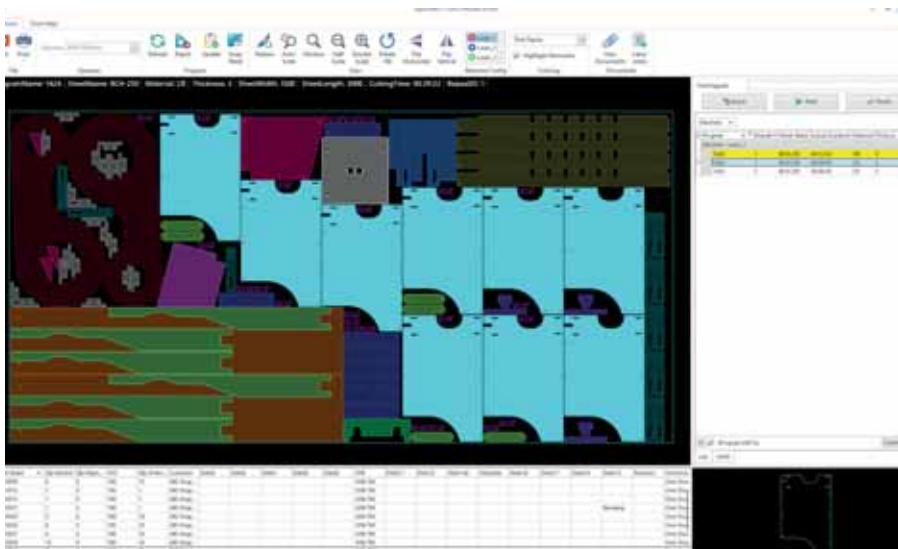
Other SigmaNEST developments include expanded support for the TRUMPF TruMatic 1000 Fiber punch laser machine, laser precutting for creating complex threaded holes on combination machines, and the use of raw sheet edges as the part

edge with greatly improved height detection and probe cycles near the sheet edge.

The challenge of delivering an accurate quote is fundamental to the success of a project. Version 20 delivers SigmaQUOTE, a new integrated job quoting tool that replaces SigmaNEST's previous Jobs module. It is powered by SigmaMRP, so it leverages the product's robust quoting functionality, allowing users to manage companies and contacts, generate quotes for new projects, and turn quotes into work orders for production within SigmaNEST.

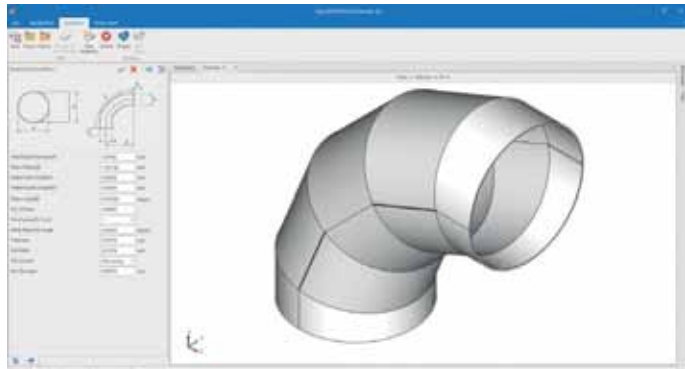
Further improvements to the SigmaTEK 3D suite of applications for tube, bar stock, 3D models and sheet metal forming include the ability to convert multi-piece common line gores into a single no-kerf, common line part within SigmaDEVELOP, a 3D system for standard ducting and HVAC geometry. SigmaUNFOLD flattens the 3D patterns and allows them to be manipulated for cutting and bending operations. An automatic slit-creation option adds a slit to an otherwise solid part so it can be unfolded into a flat pattern that can be processed on either cutting or press brake machines.

SigmaBEND version 20 includes a unique new radial menu with dynamic shortcuts for editing the tool stations, backgauges, and the part itself, as well as improved sequencing and backgauge options. In



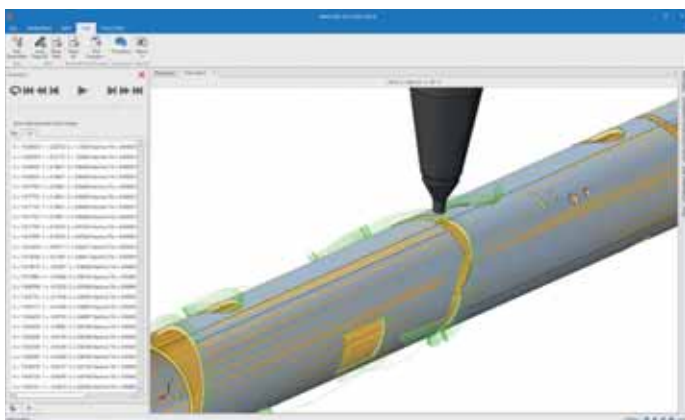
Color Offload is a shopfloor tool that uses colour-coding to track parts by next operation

In addition, a new manual station-generation tool allows for easy manual tooling setup. SigmaTUBE generates nests and NC code for tube and pipe cutting on laser and plasma machines, and Version 20 includes support for new inventory profiles and tab and notch enhancements.



SigmaDEVELOP, a 3D system for standard ducting and HVAC geometry can convert multi-piece common line gores into a single no-kerf, common line part

SigmaTEK also develop applications that drive the continuous workflow of data throughout the shopfloor. Version 20 delivers updates to Color Offload, a tool that uses colour coding to track parts by next operation, with the ability to filter by program status as well as document management capability. SimTrans is a transaction manager which links SigmaNEST with other business systems. Users can leverage SimTrans automation to create or load parts, manipulate orders, or update inventory in real time. Version 20 adds new transactions for managing jobs and provides the ability to receive email notifications for regular status updates or invalid parts.



Version 20 of SigmaTUBE includes support for new inventory profiles, and tab and notch enhancements

Commenting on the latest release, Glenn Durham, vice president of Engineering at SigmaTEK says: "We are delighted with the new version. We fully understand the role our solutions have within the manufacturing process, and the impact of marginal gains in productivity. We have knowledgeable engineers who want to make a difference, and they have worked tirelessly to ensure we release a quality product that our customers will love."

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## PSL Datatrack and ANR: two decades in partnership

ANR Manufacturing is a specialist subcontractor for both the electronics and engineering industries. The company has now relied on PSL Datatrack production control software for almost 20 years to ensure careful monitoring and control of every project. Benefiting from the modular structure of PSL Datatrack, ANR has been able to gradually invest in the software over the years as part of their continuous improvement policy and now run a much larger system than was purchased at the outset.

With ISO 9001:2015 accreditation, ANR provides its subcontract services to a wide range of OEM and blue-chip customers, many of whom have been clients for a vast number of years. The challenge has been to provide a continuous level of high product quality, traceability, on-time deliveries and service to all customers from sectors such as broadcasting, automotive, security, medical, semiconductor, sport and entertainment industries.

The company operates out of a split-level factory in Bourne End. On the ground floor, a modern machine shop equipped with high precision CNC multi-axis machines offers precision milling and turning capabilities. On the second floor, the electronics division offers PCB assemblies, cable assemblies and full turnkey box builds.

ANR's initial investment in PSL Datatrack was a result of the recognition that it needed to address the administration associated with the purchase of materials and components needed for the manufacture of its vast range of assembly types. The company appreciated that PSL Datatrack's controls were logical and strategic to their business requirements. Ease of interface and control of quotes, times and schedules, as well as development into status boards and charts, has since given ANR the flexibility to understand in real time all business demands.

With over 27,000 material stock records, PSL Datatrack controls demand, purchasing and allocation to invoice. Information covering Bills of Materials (BOMs) and the generation of Quotations, Works Orders, Purchase Orders, Goods Received Notes (GRNs), Inspection Reports, Bar Code Identification, Delivery Notes and Invoices are all managed. Important revision controls



are maintained and routed through PSL Datatrack, ensuring all correct information is available to authorised users.

The BOM module is key to ANR. It takes the data the customer provides with the materials it requires and converts it into PSL Datatrack part numbers, meaning if a customer wants to change a quantity, or even the specification of a part, ANR has complete control. It also gives the company the ability to check if parts are used on any other customer equipment and ANR can then proactively advise that there are changes. This allows it to create BOMs with which to quote customers and if successful, these transfer to purchasing.

Purchasing is a crucial element at ANR. PSL Datatrack allows it to run reports and status boards for any parts it needs, be it for a minimum stock level requirement or for a specific project at any given time. Pricing is also crucial, as discrepancies could lead to big losses on jobs. Purchasers need to ensure that the price of materials on purchase orders match prices on quotes: "We wouldn't be able to run without PSL Datatrack," says ANR materials controller Dan Avery.

Without PSL Datatrack, managing the production of printed circuit boards (PCBs) would be a logistical nightmare but the job cards produced from quotations are a great help. These detail the process and all of the

materials that go into the assemblies. PSL Datatrack ensures the quote is right, meaning data can be reused/copied throughout the rest of the process and minimise the company's administration times. "With our wide range of requirements, from simple single-material components with in-depth processes through to 1,000-line bills of materials, PSL Datatrack controls everything from enquiry through to invoice," comments ANR's managing director Nick Wilson.

Measurement of Key Performance Indicators (KPIs) provides real time information, improving performance and ensuring both product quality and on time delivery. This data is visibly demonstrated on dynamic status boards around the factory, allowing shop floor staff to successfully complete works order operations in and on time.

ANR also has changing key business information displayed on status boards in the management office, so data is always at the fingertips of the company's directors. It is clear to see at a glance what the order book is, what the next few months are looking like and also Customer Relationship Management (CRM) tasks that staff members are currently working on. PSL Datatrack and ANR work closely to develop these tailored solutions. "PSL Datatrack offers us fantastic control, live and real time



information whilst supported by financial and profitability reporting for our needs," continues Nick Wilson.

ANR's continued investment in PSL Datatrack includes more status boards and bespoke reports while continually working on efficiency gains in data entry and processing. This includes a status board at a Shop Floor Data Collection (SFDC) point, with colouring (bespoke to ANR) indicating different statuses, such as time spent, time remaining and non-productive time. This is all key to making sure the shop floor is as efficient as possible.

"We need to ensure that communication is the focus for all in production, logistics and the management teams," says Mike Garside, operations director at ANR. "We are looking to further develop real time status boards, active work-to screens and acceleration of the processing of data, whether data entry or reporting. We need to ensure that the investment in plant is backed up by data flow and analysis and more dynamic 'work-to' information will reduce all downtime between operations. These are benefits for our customers and staff alike."

For ANR, further benefits of PSL Datatrack are the facility to monitor and report on performance throughout the chain from suppliers to production through to operational roles, measuring waiting and takt time and capacity/utilisation reports. "ANR and PSL Datatrack have been working together for a long time but we've really appreciated in the last six or seven years the true benefits the system can give us," concludes Nick Wilson. "We will continue to invest, diversify and add services to our business



including test & measurement, lights out 24 hour manufacturing for the engineering division, but considering all investments, the effectiveness and measurement of our business wouldn't be possible without the use of and confidence in PSL Datatrack."

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## Systema Technologies sees ROI in two months using CrossTrack MTL material location and life tracking software

Systema Technologies Inc., based in Kirkland, WA, manufactures components for the defence, space and commercial markets. The company was founded in 2008 but has quadrupled in the four years since 2015. Materials and process engineer Marc Staiger realised early on that the forecast growth would require them to have better material management: "At that time we had around 20 rolls on site, which we were managing out-time with Excel spreadsheets, but information was not up-to-date and was scattered across PCs across the network. Also, it involved a lot of manual work counting out-time."

At that time, Systema had recently purchased JETCAM's Expert nesting software to drive its GFM knife cutter and OMAX waterjet and were made aware that JETCAM also had a product that could replace their spreadsheets with a more elegant, expandable solution - CrossTrack MTL. Marc Staiger says: "The company was already happy with the JETCAM nesting product and its support, so it made sense to look at their material tracking solution."

After an online demo, the decision was made to select CrossTrack MTL and a date was scheduled for remote installation and training. CrossTrack MTL uses MS SQL Server database platform and can also use the free SQL Express version. Installation and training were performed in just a couple of hours.

At the time of installation, Systema had four freezers, but is in the process of adding a fifth. Marc Staiger noted that CrossTrack MTL's flexible location creation has allowed them a deep level of granularity for locating material: "We've now got stock logged down to shelf location, so staff can go directly to a shelf and only have to look at



4-5 rolls on the shelf to find the right one. This is a considerable time saver. Previously we were easily spending 1-2 hours a day looking for rolls across the different locations."

The ability to sort stock by expiry and location proved immediately beneficial, with Marc Staiger citing that the savings in this area alone were huge: "Before, there was easily at least one roll or even a batch per month that could be at risk of being expired. This meant either scrapping a roll worth \$5,000 or going through the expense and tying up the resources of having it recertified. With CrossTrack MTL we can organise by expiry and operate on a First In, First Out (FIFO) basis. The software will have paid for itself within a couple of months in material savings alone."

He also appreciates the visual elements within the tabular data that CrossTrack provides: "I really like the percentage status bars that are shown within the grids that display information such as roll length or out-time. These visuals really help you to digest the information easier."

He considers another useful feature to be document linking, where documents can be linked to a given material roll, batch, assembly or kit: "This has been useful in keeping all of the receiving information tied to material lots and has been helpful with interfacing with quality control, pulling up Certificate of Conformity information on the shop floor, etc."

Systema regularly uses CrossTrack MTL's built-in reports engine, which allows users to create complex queries against the database and export the results. "This has been really useful as we can easily export it to Excel. It's helped us with working out volumes, projected usage, etc," says Marc Staiger. A traceability report for a single roll or kit can also be generated within a couple of mouse clicks.

Support through US distributor NestOne has been excellent, with Marc Staiger being pleased the few times that he's needed to use it: "Technical support is awesome. We always get a prompt response whenever we have a question." Staff have also taken advantage of JETCAM's 'University', an

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online video tutorial system comprising of hundreds of short videos covering all products. Since implementation staff have watched nearly 400 videos, allowing them to get answers to common questions at any time.

Although Systema currently use CrossTrack MTL independently of its JETCAM Expert nesting implementation, it has the option of upgrading to a more integrated solution that will provide nest scheduling, automatically select the best roll to cut when a nest is scheduled and track location and life down to ply level. Mobile apps are also available for iOS and Android devices.

The company has seen significant growth in the last few years, with the number of rolls held in stock now over 150 and a second facility opening nearby. Marc Staiger concludes: "CrossTrack's flexibility and expandability will make it even more pivotal for us to maintain control over our material and helping with planning, purchasing and quality."

JETCAM International has been developing and distributing its JETCAM Expert range of CAD/CAM software since



1986, serving the sheet metal and aerospace/automotive composite cutting industries. In use in 82 countries worldwide, JETCAM software supports virtually every CNC punching, laser, plasma, routing, waterjet and flatbed cutting machine available today, and provides automation and Industry 4.0 IIoT connectivity. The

software has received various accolades and awards due to its high level of automation and fast return on investment.

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## Telsonic Ultrasonics slices through composites for Loop Technologies

Composite materials are becoming increasingly commonplace as they are introduced into growing numbers of applications where their characteristics enable them to outperform more traditional materials like steel or aluminium. These advanced materials also require specialist technologies to perform the different operations needed to prepare, handle and process individual pieces, piles of dry fabrics, or components at the prepreg stage.

Dorset-based automation specialist Loop Technology is at the forefront of developing the technologies required for composite component manufacture with a wide range of systems including layup, inspection and kitting, plus trimming systems which rely on Telsonic's ultrasonics technology.

The growth in the use of composite materials is widespread across the aerospace, defence, automotive, marine and consumer sectors. Many of the components produced for these sectors have complex geometries, therefore when it comes to cutting or trimming, 6-axis robot technology in the form of Loop

Technology's FibreCut system offers both a comprehensive and flexible solution.

The FibreCut system draws upon the versatility and compact nature of Telsonic's ultrasonic technology, to provide a powerful solution capable of making precision cuts on 3D composite preforms.

Telsonic's ultrasonic solution is based upon its MAG2012S generator (20 kHz variant) and SE2012 converter. Cutting knives are designed to be readily interchangeable to suit different materials or depths of cut. Typical cutting performance on dry materials, and using a 70 mm blade, is up to 200 mm per second, with up to 70 mm cutting depth in a single pass. For Prepreg material, the typical values for a 35 mm blade range from 10 to 15 mm per second with a 5 mm depth of cut per pass.

The FibreCut system is also available with a wide range of auxiliary systems including infrared temperature measurement, automatic broken blade detection, force torque monitoring and systems for particulate extraction, blade cleaning and blade alignment.



Telsonic engineers worked closely with Loop Technology, performing a series of cutting trials to establish optimum cutting speeds and depths whilst minimising cutting forces on a range of material configurations. As the use of composite materials continues to expand in our manufacturing industries, the technologies and solutions from Loop Technologies, including the FibreCut system, are likely to become industry standards for a wide range of sectors.

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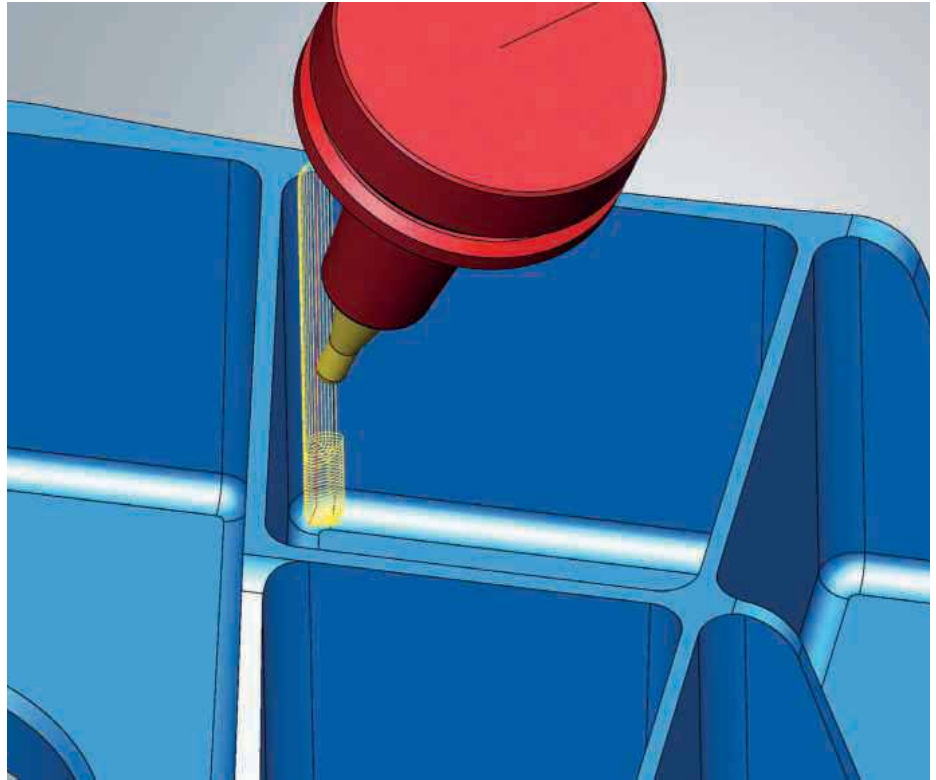
# Faster programming, more efficient cutting

Version 2020.1 of the hyperMILL® CAD/CAM suite is now available. This software release provides additional user-friendliness for hyperMILL programmers.

Enhancements are to programming tasks and also to make machining quicker and simpler. The new 3D and 5-axis corner rest material strategies guarantee the efficient machining of rest material in corners. What's even more promising is that optional modules hyperMILL ADDITIVE Manufacturing and hyperMILL VIRTUAL Machining offer groundbreaking technology, simulation, optimisation and connectivity solutions consistent with key directions of modern manufacturing.

hyperMILL 2020.1 provides an innovative approach to reduce rest material in corners after roughing tasks. The 3D and 5-axis corner rest machining strategies bring together parallel and Z-level rest machining toolpaths into an optimal process. 5-axis corner rest machining makes indexed machining of difficult to reach corners possible. Automatic inclination selection, simultaneous linking movements, and collision avoidance are available in this process. A further example of increased efficiency is 5-axis turbine blade tangent machining with the conical barrel cutters (also called circle segment or parabolic end mills) co-developed by OPEN MIND. Top milling with these tools makes higher feedrates possible and allows a more even surface quality to be achieved.

Reducing programming times in line with



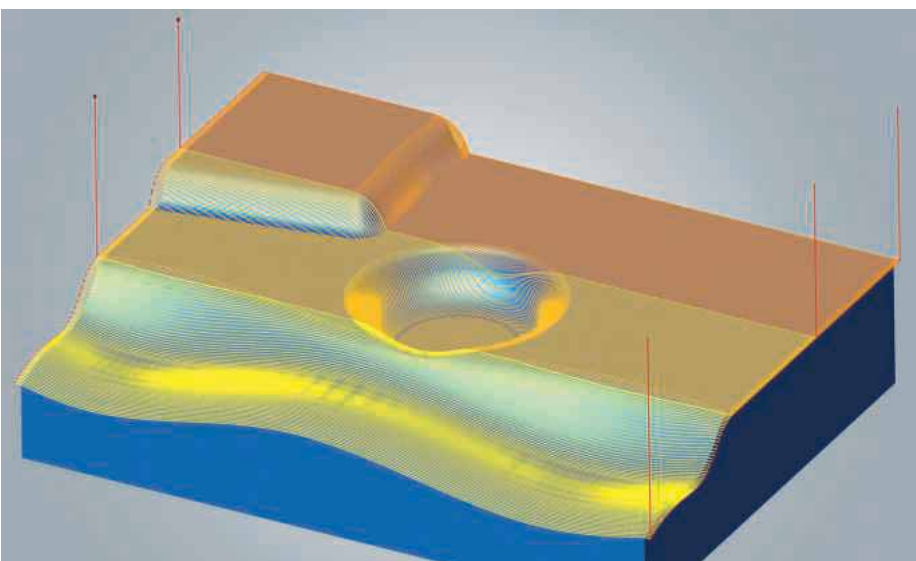
New function for the efficient 3D and 5axis machining of corner rest material

practical requirements is an important motivation in further developing hyperMILL. A new tool path splitting option enables you to automatically split long tool paths according to a specified time or distance. This is essential when cutter life is an issue while machining hard materials. This procedure reduces the need to modify programming jobs into smaller regions or

the added risk to manually edit tool paths to account for tool life. Now the hyperMILL system can account for tool life and schedule the tool changes. Mill-turn tool paths can also be split to account for tool life or based on cutting technique. Features can be automatically identified by hyperMILL to enable inside, outside, face or grooving tool paths.

The hyperMILL VIRTUAL Machining Center also boasts new features. The Optimizer module, which allows a CAM program to be perfectly adapted to the machine's limitations during postprocessing, for example, now supports the "Smooth linking" function. This automatically optimises all linking movements between the individual operations during postprocessing. This ensures that repositioning and movements are always in close proximity to the workpiece, while also being checked for collisions – making programming with the job linking obsolete.

Another new feature from 2020.1 will be that users can independently make small automation tasks a reality with the help of the hyperMILL AUTOMATION Center. The hyperMILL AUTOMATION Center serves as



hyperMILL makes it possible to automatically split tool paths. Setup changes can be scheduled precisely

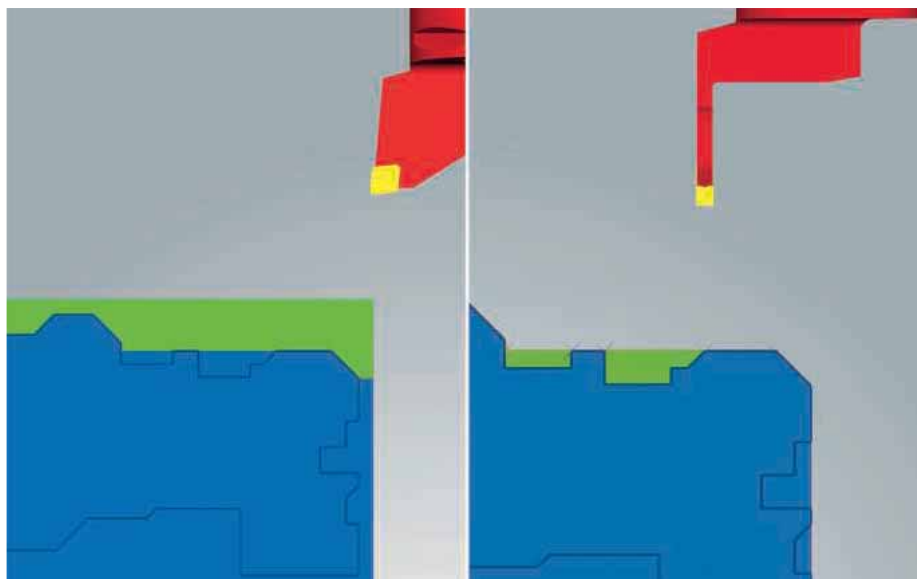
both a development and runtime environment. This allows you to automate the joblist creation process and the selection and positioning of the clamping device, as well as define a uniform process for all programmers.

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

OPEN MIND develops optimised CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the hyperMILL CAM system.

hyperMILL provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND strives to be the best and most innovative CAD/CAM manufacturer in the world, helping it become one of the top five in the CAM industry according to the "NC Market Analysis Report 2019" compiled by CIMdata. The CAD/CAM



Mill turning: automatic splitting of contour features for simplified programming

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

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# Latest WORKNC makes smart factories smarter

## Rethink manufacturing with WORKNC 2020.1

The latest release of WORKNC, from Hexagon's Production Software portfolio, is said to make smart factories even smarter with new and enhanced functionality which addresses a number of manufacturing issues.

Walter Neveux, WORKNC product owner, says developers have looked at several production questions, including:

How many rest-roughing processes do you apply, and how lengthy are they?

How much stock material do you leave for pre-finishing and finishing, and could it be less?

Could we eliminate pre-finishing altogether?

He says that when machining with high feed cutters but calculating with a theoretical circular insert the resulting stock left will be inherently uneven. WORKNC 2020.1's Roughing with Advanced Toolform technology allows the milling process to deliver a more accurate roughing stock, eliminating imprecisions characteristic to the traditional parametric toolpath calculation. "While the main roughing cycle took the same time to machine, the more precise result allowed all subsequent rest-roughing toolpaths to be significantly faster in both calculation and machining times. Our tests presented improvements in the rest-roughing area of up to 70 percent", he explains.

Pierre Bassomo, WORKNC CAM senior developer supports those findings: "The use of the modern Advanced Toolform technology, even when applied to regular

parametric tool shapes, improves the quality of the toolpath, and allows the user to break free from limitations such as stepovers or negative offsets bigger than the tool's corner radius, even on conical tools."

### WORKNC Designer

WORKNC's Advanced hybrid modelling system, WORKNC Designer introduces an Electrode module, with intuitive and simple dedicated functions designed by engineers with experience in the mould and die industry. Hayley Burrows, WORKNC Designer's technical product manager, comments: "The combination of the new, streamlined electrode functionality, easy to use direct modelling commands and powerful surfacing and healing tools, means electrodes from imported models can be extracted quickly, to create finer details on parts which can't be machined using traditional milling techniques."

WORKNC Designer also brings an enhanced link to WORKNC Traditional, now preparing the entire workzone before sending it to the manufacturing planning phase of the process. Miguel Johann, Mould and Die product and market manager, says: "The workflow has been streamlined, making sure the process is as simple, automated and straight-forward as possible. The WORKNC solution is now empowered by a modern CAD preparation platform that will continue to bring WORKNC users closer to the digital thread."

WORKNC 2020.1 also brings an integrated link to Hexagon's simulation

solution, NCSIMUL, meaning that manufacturing data created in WORKNC is brought automatically into the application, including fixtures, roughed stock, design part, program origins, machine programs and complete cutting tool library. From the WORKNC to NCSIMUL link interface, users can elect the Digital Twin Machine available to prove out post-processed G-code programs. This seamless process can transfer multiple part setups for verifying multiple operation G-code.

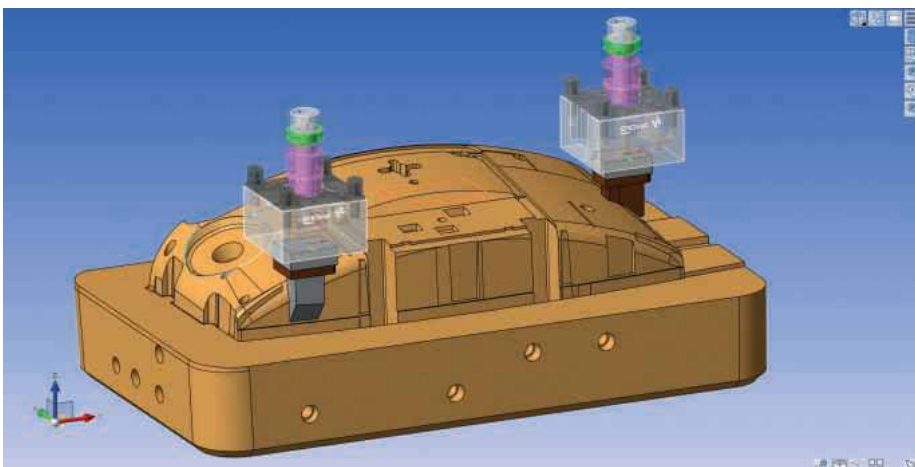
Silvère Proisy, Simulation Solutions sales manager for the Americas, says: "This link between the two solutions is designed so that no further manipulation is required in NCSIMUL for the project set-up. After the interface has done its job, NCSIMUL verification is ready for troubleshooting the new machining jobs through the unique and easy three-step verification process. It means no more file manipulation, lower risk of error, and faster programming-to-verification time." NCSIMUL provides feed rate optimisation, and shop floor documentation.

Concluding, Miguel Johann says: "Overall, as part of Hexagon's philosophy of building smart into all our solutions, the new and enhanced functionality in WORKNC 2020.1 provides more interconnected data, which contributes to smart factories becoming even smarter."

Hexagon is a global leader in sensor, software and autonomous solutions. It is putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications. Hexagon technologies are shaping urban and production ecosystems to become increasingly connected and autonomous, ensuring a scalable, sustainable future.

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# ModuleWorks releases 2019.12 CADCAM components

ModuleWorks recently announced the release of its 2019.12 CADCAM software components. This is the third major release of 2019 and is available now for download from the ModuleWorks website.

ModuleWorks is at the forefront of multi-axis machining and simulation technology, providing the toolpath and simulation technology that powers many of the leading CAM systems around the world today. This latest release contains new performance-optimising cycles for 5-axis and 3-axis machining as well as enhanced visual accuracy and sharper imaging for the Cutting and Adding Material Simulator.

### New finishing cycles for multi-axis machining

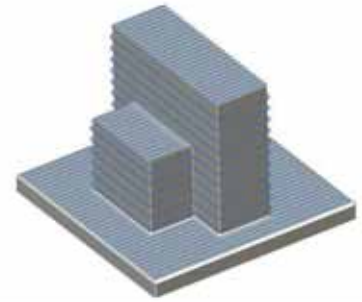
Two new finishing cycles have been added to the multiaxis machining toolpath generator: one for wall finishing and one for floor finishing. Both cycles support barrel tools and offer all the process-optimising features of the original roughing strategy, such as easy part selection, automatic



collision checking between the tool and the part and automatic collision-free linking.

### Combined cycle for deep and shallow areas

With the HSM toolpath generator, operators can now machine steep and shallow areas in a single cycle. This accelerates CAM programming by eliminating repetitive steps and means that programmers only need to set up a single machining operation. The cycle consists of constant Z for steep areas and two options for shallows areas, either constant cusp or parallel cuts.



### Cutting and Adding Material Simulator

New algorithmic enhancements improve the visual accuracy of the simulation to deliver a sharper and more realistic simulation for spherical tools such as ball mill and bull mill tools. The resulting simulated part now has crisp corners and very smooth curves that accurately reflect the real shape of the tool without any noticeable segmentation or fragmentation.

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# Advanced FARO solution in the 'pipeline' for Alltube

Based in Daventry, Northamptonshire, Alltube Engineering Ltd manufactures a comprehensive range of flexible and rigid pipeline products. Established in 1986 as part of a small group, it became a privately-owned business in 2007. Alltube Engineering has significantly increased its output in the areas of tube and pipe manipulation and fabrication and also boosted its hydraulic and pneumatic hose assembly activities.

The company serves a diverse UK customer base that operates across a range of industries, including the agriculture, construction, bus, trucks and rail sectors. Alltube Engineering's in-house technical expertise means that it is able to work closely with customers in the areas of prototyping, product development and support through to full scale production.

To help ensure its products' ease of installation and performance, the ISO9001:2015 approved company administers a rigorous quality management system. As many of the company's rigid pipes are designed to be installed in confined areas and to pass through relatively small spaces, they feature extremely intricate, free-form 3D shapes and have demanding dimensional and geometrical tolerances. In addition to other quality control tools, Alltube Engineering use a fixed Coordinate Measuring Machine (CMM) to inspect its products and to generate customer quality reports. Although, the sheer size and complex shapes of many of the company's larger tubes and pipes render fixed CMM, tactile probing measurement techniques impossible to use.

In an effort to find a flexible means of accurately measuring the company's entire product ranges, including its previously difficult to inspect large, complex pipes and tubes, Alltube technical director, Paul Fuller, recently searched for a suitable, large capacity, high-precision solution. Having considered other options, following an in-depth demonstration, he decided that the FARO QuantumE ScanArm was the ideal solution to the company's inspection needs. Not only did the Quantum have the required capacity, accuracy and speed and ease-of-use, it was able to link to the company's CNC bending machines.

"Alltube has a long-established



reputation as a major supplier of flexible and rigid pipeline products to many of the UK's leading OEM's, across a wide variety of markets," explains Paul Fuller. "Between them, our directors have over 100 years of in-depth experience in engineering. This accumulated knowledge has resulted in our flexible approach and our ability to supply customers, ranging from SME's, through to major international organisations, with the best possible solutions and to deliver a reliable, cost effective service.

"A major problem we have is that the fitting of ridged pipework, such as hydraulic pipes, is rarely considered when customers undertake new projects, such as the design of commercial vehicles or buses. Therefore, we are often supplied with finished vehicle designs and then challenged to create relatively long, convoluted hydraulic pipe runs that will avoid obstructions and pass through the most limited of spaces. Also, they must not rub on areas such as vehicle chassis or interfere with any of the vehicles' moving parts.

"A vitally important aspect of our products is that, many of our hydraulic pipes play a critical role in vehicles' braking systems, so it is extremely important that, to prevent pipe abrasion and eventual failure, they are manufactured in such a way that no unintentional contact and chaffing occurs with vehicle parts.

Paul Fuller continues: "Achieving optimum 3D pipe shapes is never easy, as for instance, a pipe bend with a small angular error at one end can result in an inaccuracy of several mm at the opposite end of a long pipe. Hence, to satisfy the challenging briefs that are often given to us, our designs often feature demanding 3D geometric forms with extremely tight dimensional and geometrical tolerances. To ensure that each manufactured hydraulic pipe adheres to the required design specification, we thoroughly inspect each product before dispatch.

"As the use of physical measuring devices for inspecting rigid pipes is both cumbersome and extremely long winded, we recently investigated the available non-contact measuring systems. A practical demonstration of a FARO Quantum ScanArm, fitted with FAROBlu™ Laser Line Probe SD, measuring a selection of our most testing products, proved to us that it was the ideal answer to our inspection problems. Not only was the FARO ScanArm much quicker and easier to use, it proved more accurate than our previously used inspection methods. It was also able to link to our CNC pipe bending machines and to automatically generate comprehensive customer inspection reports. Last, but not least, the Quantum FaroArm FAROBlu LLP combination is capable of both contact and



non-contact measurement. By using the ScanArm's advanced 3D laser scanning capabilities, we have reduced our inspection times by approximately 90 percent and by extension reduced our delivery times.

"Since using the Quantum, in addition to being employed on our pipe inspection routines, we have found many further uses for it, including undertaking previously difficult to achieve, precise reverse engineering applications. Also, unlike our static CMM, it is extremely useful that the Quantum is portable and quick to set up. Therefore, besides being used throughout our inspection and production departments, we are able to take it to our customers premises to perform our important on-site measuring tasks."

As a leader in the field of measuring arm technology for more than 35 years, FARO has designed, developed and delivered the leading and most trusted products in the market and is recognised as the world's most innovative portable 3D measurement solution provider for factory metrology.

The FaroArm remains the preeminent Portable Coordinate Measuring Machine (PCMM) that allows manufacturers easy verification of product quality by performing precise 3D inspections, tool certifications, CAD comparison, dimensional analysis and reverse engineering.

Available in three different models with varying accuracy specifications, the advanced Quantum FaroArm is the first Arm on the market that can be verified against the stringent international certification standard for articulated arm CMM's, ISO 10360-12:2016. The standard ensures maximum measurement consistency and reliability when used across a wide range of working environments.



The FARO Quantum model, as purchased by Alltube Engineering, is the perfect portable CMM for companies looking for an easy-to-use, robust and precise inspection solution. As the Quantum with the FAROBlu LLP delivers best-in-class 3D laser scanning capabilities, the staff of Alltube Engineering are now enjoying the multiple benefits of the ingenious system's use.

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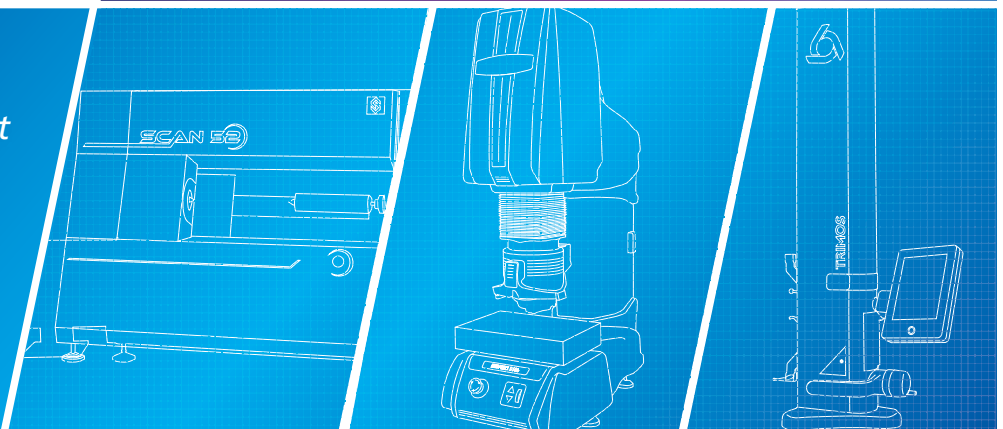
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# CMM manufacturer launches portable measuring arms

LK Metrology, which has been manufacturing static Coordinate Measuring Machines (CMMs) in the UK since 1963, has for the first time diversified into the supply of 3D articulating arm metrology systems, otherwise known as portable arms, with the launch of a range of 24 machines called FREEDOM arm.

There is a 6-axis model for touch probing and a 7-axis version for multi-sensor metrology including laser scanning. Both are available in two accuracy levels and the four products come in six sizes with a reach of up to five metres. International sales and support is through the company's offices in the UK, North America, Belgium, France, Germany, Italy and China as well as via a worldwide distributor network.

Marketing manager Dave Robinson, who is based at the firm's CMM factory near Derby, comments: "The solutions we can offer customers is greatly expanded by the new range of arms. Their portability especially well suits them to line-side

measuring and inspection in factories, while their compactness makes them ideal for use on machine tools for in-process quality control.

"The platform is also particularly appropriate for reverse engineering applications, virtual assembly design environments and 3D modelling. Moreover, if very high precision tolerances do not have to be measured, a portable arm is a cost-effective way to progress from manual to CNC metrology."

The two 6-axis arms for tactile inspection are named FREEDOM classic and FREEDOM select, the former being the entry-level model and the latter the enhanced accuracy version, which is supplied with a calibration bar. Addition of an extra degree of freedom provides infinite movement and enables laser scanning with a Nikon Metrology ModelMaker H120, MMDx100 or MMDx200. These 7-axis arms, again in two accuracy versions, are called FREEDOM classic scan and FREEDOM

select scan. The touch probing accuracy of all FREEDOM arms is certified to ISO 10360-12 before delivery and may be supplied with a variety of aluminium and carbon fibre probe kits, styli, mounting rings including some with a magnetic or vacuum base, tripods, rolling stands and carts with a granite top.

Carbon fibre tubular construction ensures stability under challenging conditions. Infinite rotation and a proprietary counterbalance makes manual movements light, which promotes ease-of-use even when trying to access awkward areas of a component. Wi-Fi connectivity and battery power allow completely portable wireless touch probing for maximum flexibility. The arm can be stowed and locked in place between measurements and when it is being relocated. Even the largest FREEDOM arm model weighs less than 11 kg, making setup and repositioning quick and easy.

A notable feature of the arms is the inclusion of absolute rather than incremental



rotary encoders to feed back the angular position of every joint to the control software. The equipment may therefore be used immediately on start-up, avoiding the need to calibrate the probe before use every time. This raises productivity, as does the highly repeatable probe connection that allows them to be swapped quickly without interrupting the measuring process to recalibrate. Contributing also to efficiency and convenience is an LCD display with a quick-access menu on the probe wrist, putting the most useful information directly in the hands of the operator during measurement.

A strong line-up of third-party inspection software can be supplied by LK Metrology with its new FREEDOM arms, including InnovMetric's PolyWorks Inspector that has the ability to swap programs seamlessly between portable and static CMM platforms. ArcoCAD metrology software from Metrostaff is also available, as is Nikon Metrology's Focus Inspection for data acquisition and analysis, while the latter's CMM Manager inspection package may be used for touch probing only.

LK Metrology is renowned for innovative

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

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



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

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## AES Precision ensures high quality components with Trimos height gauge

Precision turned parts manufacturer AES Precision has invested in a Trimos V5 height gauge from Bowers Group to ensure quality of components used in the medical, defence, aerospace, automotive and electronics industries. Based in Ashford, Kent, AES Precision produces complex, high precision components used by some of the largest manufacturing and technology companies in the world.

Mark Wilson, director at AES Precision Engineering, says: "We have strict quality control procedures and must meet tight tolerances, so accuracy is incredibly important to us. The Trimos height gauge is a great solution for our general inspection requirements."

AES Precision typically uses a CMM for the measurement of complex components. For basic parts requiring quick and accurate measurements, however, a simple solution was needed that would be fast and easy to use. The business previously used a basic digital height gauge, but decided it was time to upgrade to a more sophisticated model with a few more features.

The Trimos V5 height can either be

manually operated or motor driven and has a clear display and user-friendly functions. It offers exceptional ease-of-use; so easy in fact that all shop floor operatives and inspectors at AES Precision use the height gauge on a daily basis.

Mark Wilson continues: "We find the height gauge very accurate and it has a great range of functions to suit our needs. Training was very straightforward and everyone here was confidently using the height gauge very quickly."

Having the option of both manual and motor-driven operation means the height gauge can accommodate multiple users and achieve consistently accurate measurements regardless of which mode is used. The side probe holders enable measuring with long, robust probes, which guarantee excellent repeatability. AES Precision calibrates the height gauge in house at recommended intervals to ensure consistently accurate measurements.

As AES Precision serves industries renowned for their precision component parts, quality is extremely important. The business also offers First Article Inspection



Reports (F.A.I.R.), including tailored reporting and data collection to suit the individual requirements of clients. This, along with a fully traceable QMS system, means that AES Precision's quality system meets or exceeds the requirements of most clients manufacturing needs.

**Bowers Group**  
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# What are the benefits of rotary friction welding?

There are several types of friction welding processes. One such method, rotary friction welding, is a method that KUKA specialise in, at its premises at Halesowen in The Black Country.

This process requires specialist technology to control the weld which offers the advantage of enhanced quality assurance, efficiency and repeatability. Thompson friction welding equipment, built by KUKA, controls and monitors all the key characteristics of the friction welding process, including rotational speeds, times, pressures and length loss to provide repeatable and reliable high integrity bonds every time. Coded and skilled personnel are not required, nor are any consumables.

The process can be automated for high volume applications utilising robots to load and unload or specialist subcontract departments can be used for small batch production where demand is more limited. OEM's of safety critical components specify friction welding as the only approved method of joining for their components. These include, for instance, light vehicle, beam and banjo axle manufacturers, hydraulic cylinder manufacturers with piston rods and mining and oil and gas manufacturers with drill pipes.

Friction welding is a misnomer in relation to the rotary friction welding process which is essentially a forging process. There can be confusion surrounding friction welding processes, often they are incorrectly



described as fusion welding processes, which they are not. The bonds created by rotary friction welding consist of 100 percent parent material across the whole cross section of mating interface and, crucially, neither material reaches its' melting point at any point during the friction welding process. Therefore, the process is described as a solid-state joining process and not a fusion weld process.

Other than repeatability and time cost saving, the large advantage of these processes is the ability to weld dissimilar materials with different thermal expansion coefficients and those bonds generally retain their intrinsic parent material characteristics with the bond between them maintaining a minimum integrity equal to the weakest of the two parent materials. This is very appealing to manufacturers seeking a high integrity joint who also need to reduce cost and weight by joining dissimilar materials.

Friction welding occurs when the two components to be joined are brought into contact with each other and frictional heat is generated using rotational motion for a pre-determined amount of time until the parent materials soften and plasticise. The application of a forge force which displaces/extrudes the softened parent material, weld flash, results in a permanent molecular bond across the entire interface of the parent materials.

The cycle times for such joints can be as short as a few seconds depending on material combination and the cross-sectional area.

Features and benefits include:

#### **Fully homogenous bond across the entire joint interface**

During the friction welding process, the materials are bonded together through the entire contact surface area whether the component is solid or tubular.

#### **Produces dissimilar material direct bonds**

The ability to join dissimilar materials together that are considered un-weldable through conventional welding or some combinations that are otherwise considered incompatible or unsuitable.

#### **Materials do not melt during the friction welding process**

The materials do not reach their melting points. The materials plasticise rather than melt, created by the heat generated from one material rubbing against another.

#### **High speed-high integrity bonds**

In most cases friction welding is quicker than traditional convention or fusion welding techniques with cycle times as little as a few seconds.

#### **Machine controlled process eliminates human error**

100 percent in-process monitoring of quality and 100 percent production repeatability.

#### **High bond quality**

RFW maintains the parent material fine grain structure and produces a very narrow heat affected zone with hardening more limited than with fusion bonding methods like Arc, Tig or Mig or EB.

#### **Friction welding is a friend to the environment**

No toxic smoke, fumes, or gases are emitted and no exhaust systems are required.

For more information regarding KUKA's subcontract friction welding capabilities, please contact [sales@kuka.com](mailto:sales@kuka.com) or call 0121 585 0888.

**KUKA Systems UK Ltd**  
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# WIRESENSE

## THE WIRE ELECTRODE ACTS AS A SENSOR



### What's your welding challenge?

Let's get connected.

**IDENTIFYING AND ADAPTING COMPONENT  
AND CLAMPING TOLERANCES.  
WITHOUT OPTICAL MEASURING DEVICES.**

Component deviations such as varying air gaps or clamping tolerances can impair the perfect weld seam in automated manufacturing. In some cases, minimal material differences or imprecise clamping devices can have a negative influence on the welding result and cause costly and time-consuming rework.

Find out more about WireSense  
from Fronius

[www.fronius.com/wiresense](http://www.fronius.com/wiresense)

# WireSense from Fronius

The wire electrode that doubles as a sensor

WireSense is the assistance system from Fronius which makes robotic welding more efficient. The wire electrode is turned into a sensor that checks the component position before each weld. Manufacturing inaccuracies can be compensated for and perfect welding results achieved by reliably detecting actual sheet edge heights and positions. Rework and component rejects are largely eliminated, while additional optical measuring devices become unnecessary, resulting in significant time and cost savings.

Component deviations such as varying air gaps or clamping tolerances can cause welding problems. In the worst-case scenario, these deviations result in a change in the welding position and cause a lack of fusion in the weld seam. For this reason, many manufacturing companies use optical measuring devices for robotic welding. Not only are they expensive but they also significantly restrict component accessibility, need regular cleaning and require additional calibration between the Tool Centre Point (TCP) and the sensor. WireSense from Fronius offers an easier, more robust and precise alternative.

WireSense technology does not require any additional sensor hardware components, instead the wire electrode is used as a sensor. The welding torch scans the component with a reversing wire movement and the welding system sends the height information and the edge position to the robot. For example, if a lap joint is being welded, the edge position can



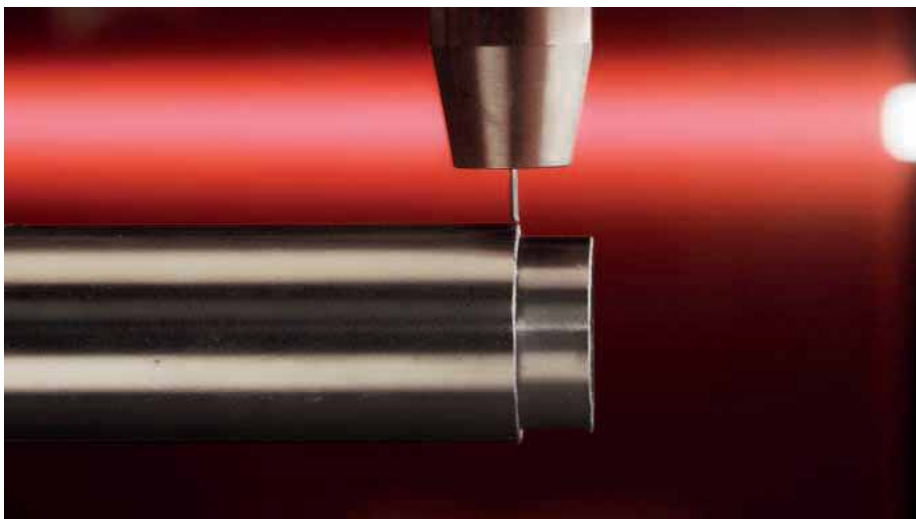
be precisely defined, and the system can react to any deviations. The robot adjusts the weld seam process based on an application-specific program.

By evaluating the height information, the robot can determine both the course of the edge and the actual edge height. It is also possible to determine the exact air gap between the sheets. Edges are detected from a height of 0.5 mms. WireSense can be used with steel, stainless steel, aluminium,

and other alloys. It is with aluminium that WireSense truly comes into its own, as reflective surfaces are frequently a major obstacle for optical measuring devices.

Furthermore, optical sensors are usually installed on the robot as additional hardware where they become disruptive contours the robot arm. Depending on component accessibility, this makes the use of cameras or lasers problematic. The wire sensor does not impose any such restrictions.

WireSense delivers height information, which allows component contours and air gaps to be measured. During commissioning, welding parameters for different air gap sizes can be defined and saved. The WireSense assistance system therefore enables the robot to determine the actual component conditions in order to call up the suitable welding parameters. In anticipation of possible air gaps and other deviations that could lead to lack of fusion, without the use of sensors the welder often has to work at a reduced speed, in order to ensure a high weld seam quality. Thanks to the precise detection of such anomalies in advance, the robot can now join materials



fully automatically at the optimal speed, which contributes to additional cycle time optimisation.

In this way, the new WireSense technology ensures that welding is always performed at the exact weld seam position with optimised parameters. Final visual inspections, rework and component rejects can be significantly reduced resulting in time savings and serious cost reductions.

WireSense can be used with any TPS/i welding system from Fronius that is configured for the use of the CMT welding process. The precise wire movement of the Robacta Drive CMT wire feeder, which sits directly on the torch body, is crucially important. Retrofitting of existing welding systems is possible at any time due to its flexibility.

Fronius Perfect Welding is an innovation leader for arc welding and a leader for robot assisted welding. As a system provider, Fronius Welding Automation also turns customer-specific automated complete welding solutions into reality in a number of areas, from container construction right up to cladding for the offshore sector. Power sources for manual applications, welding



accessories and a wide range of services add to its portfolio. With more than 1,000 sales partners worldwide, Fronius Perfect Welding is never far away from its customers.

Fronius International GmbH is an Austrian company with headquarters in Pettenbach and other sites in Wels, Thalheim, Steinhaus and Sattledt. With 4,760 employees worldwide, the company is active in the fields of welding technology, photovoltaics and battery charging technology. 92 per cent

of its products are exported through 30 international Fronius subsidiaries and sales partners/representatives in over 60 countries. With its innovative products and services and 1,253 granted patents, Fronius is the global innovation leader.

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**Email: info-uk@fronius.com**  
**www.fronius.co.uk**

## C-Gate Industry 4.0 enabled

### Digitalisation of welding technology

The CLOOS gateway C-Gate enables the demand-based management of welding and robot data. With the integrated information and communication tool you visualise the performance of your robot systems, localise shortages and increase the efficiency of your welding production.





Weld your way.

# Why two heads are better than one

PTG introduces Powerstir dual weld-head friction stir welding for electric vehicle OEMs

UK-based Precision Technologies Group (PTG), the manufacturer of the globally acclaimed Powerstir range of friction stir welding machines, has introduced a number of dual weld-head FSW models specifically for use in the volume production of automotive battery tray floor assemblies from extruded aluminium panels.

## Ensuring a tight weld-flatness tolerance

PTG has long used its considerable knowledge of the FSW process to assist automotive OEMs in producing lightweight, robust and aesthetic components for battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV). Aimed directly at manufacturers of skateboard chassis structures, the dual weld-head process developed by PTG ensures that a tight weld-flatness tolerance is achieved during battery tray floor construction.

A tight weld-flatness tolerance is essential to ensure that each battery cell sits perfectly level within its housing. PTG Powerstir dual weld-head FSW machines provide an even and stable welding process, something that is achieved thanks to the company's unique 'matched' dual-force control systems and balanced upper and lower head welding parameters. The result is exceptionally stable friction stir welding by both the upper and lower weld heads, producing matched weld seams with balanced heat input. This, in turn, minimises post-weld distortion and equips each welded assembly with a significantly improved flatness tolerance when compared to existing conventional single-side FSW techniques.

## High-output production cell

As aluminium extrusion lines usually produce panels of 300 mm to 600 mm wide,



PTG has also developed a fully automated, high-output Powerstir FSW production cell for the rapid friction stir welding of multiple extrusions, to create single structures for fabrication into battery tray floors. These structures are typically up to 2.4 m wide.

"Our dual weld-head FSW technologies, whereby both sides of an extrusion are welded simultaneously, not only remove the time-consuming process of lifting and turning extrusions between welds, but also allow for equal heat dispersion which results in minimal distortion," comments PTG Powerstir regional sales director, Mark Curran.

In the PTG Powerstir dual weld-head FSW process, typically four to 12 individual child-part extrusions are brought together for assembly. Following gantry loading, each extrusion is automatically positioned and clamped ready for friction stir welding, after which the partially completed vehicle component is automatically repositioned, ready for the next panel to be welded in place.

## Reduced wall thickness

"In addition to providing automotive OEMs with a state-of-the-art means of joining metals and achieving extremely high-strength results, it is also important to consider that in many instances, the use of friction stir welding also allows for reduced wall thickness, an important aspect in reducing vehicle weight," adds Mark Curran. "As the friction stir welding process generates very little heat, the crystalline structure of the metal remains unchanged, retaining its original strength. There is no need for

inert gas, no need for heat-treating post weld and no requirement for additional surface finishing."

PTG is widely considered to be a leader in the development of FSW technologies for transport applications. Organisations involved in the manufacture of aerospace components and the production of aluminium carriage panels for high-speed trains were among the first to recognise the benefits of Powerstir friction stir welding. Working with 5000 and 6000 Series aluminium alloys, and magnesium alloys



from 3 mm to 6 mm in thickness, PTG is currently developing FSW processes for several automotive OEMs.

Mark Curran states: "In addition to building Powerstir machines specifically for the production of battery tray floor assemblies, we are also creating FSW techniques for the production of coolant units, control box panels and car body panels, as well as body panels and components for commercial vehicles."

Through the use of industry standard CNC systems, equipped with PTG Powerstir software, data-logging and interpolation technologies, 2-D welding guided by laser tracking, can be carried out on precise tool paths, with force control ensuring consistent welded seams. QR codes are used to identify each extrusion before welding commences. Each completed panel is then DMC coded to identify the panel, for complete and ongoing traceability throughout the manufacturing cycle.

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## Reliable protection for all budgets

Kemppi has strengthened its welding safety portfolio with new Alfa and Beta e-series welding helmets and respirators. Certified to the latest standards, the new models offer excellent protection for arc welding, cutting, grinding, gouging and inspection processes. The Alfa and Beta e-series are now available from authorised Kemppi dealers.

The Alfa and Beta e-series models feature an impact-rated shell that is both lightweight and strong. The spacious design accommodates eyeglasses and half masks, while allowing good access to tight spaces. Several settings and features support easy adjustment for the best personal fit and extra welding comfort, including a comfort headband, integrated magnifying lens holder and an overall 20 percent weight reduction, compared to the previous Beta models. New optional leather neck and shoulder protectors are also available.

The Alfa e-series welding helmets represent the most compact, lightweight face shields in Kemppi's welding safety product range with weight starting at just

467g. The Alfa e-series models are durable, low-cost solutions that provide protection for all general welding applications and grinding and are equipped with either a passive glass welding lens or auto-darkening ADF welding lens.

The Beta e-series welding helmets are designed for professional welders. Certified for welding, cutting and grinding according to EN175 B and AS/NZS 1337.1, the new lightweight Beta models start at just 473 g. The range includes three models that are equipped with either passive or automatic ADF lenses.

The Beta PFA/SFA/XFA e-series respirators offer reliable protection from work-related, airborne contaminants and are certified with a maximum inward leakage level of two percent. They provide cool and clean breathing air from either a PFU 210e battery powered filter unit, offering optimal freedom of movement around the workspace, or a supplied breathing air solution, featuring RSA230 connection to a breathing air source.

The Alfa and Beta e-series offers a wide



choice of welding lens options. The simple yet effective glass welding lenses, or convenient automatic ADF welding lenses, with alternative shade adjustment values, are available in different viewing area sizes and shade ranges.

Fitted as standard in the Beta e90A and Beta e90 SFA models, the new SA60B ADF welding lens features a 30 percent larger viewing area, excellent optical performance and brighter colours, due to LiFE+ colour technology. The lens measures at 60 x 100 mm and features a welding shade range 3.5/5/9-13 with cutting and grinding modes. It is powered from a solar cell panel, supported by two replaceable CR2032 batteries.

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**www.kemppi.com**

# KUKA

## Rotary friction welding solutions \_efficient and sustainable material bonds

The question that engineers and manufacturers ask when considering their production joining and manufacturing processes is can we do this better, cheaper and more efficiently?

Joining similar, dissimilar or exotic materials directly to each other with a high integrity bond is the holy grail of industrial manufacturing. The benefits of achieving this is to reduce cost, increase quality, efficiency and reliability. All are major considerations for OEM's competing in the global market place and who need to establish their positions with innovative, quality and cost effective products.

Subcontract friction welding solutions from KUKA, provide an efficient and sustainable method of achieving high integrity similar and dissimilar material bonds.

**To discuss your subcontract friction welding requirements, please contact us at [sales@kuka-systems.co.uk](mailto:sales@kuka-systems.co.uk) or call us on 0121 585 0888**

[www.kuka.com](http://www.kuka.com)

Thompson friction welding machines. Built by KUKA in the Black Country, UK.

# Specialist tools target tube production

Recognised as one of the leading manufacturers of tools for the tube and pipe processing industry, Dormer Pramet has expanded its scarfing assortment.

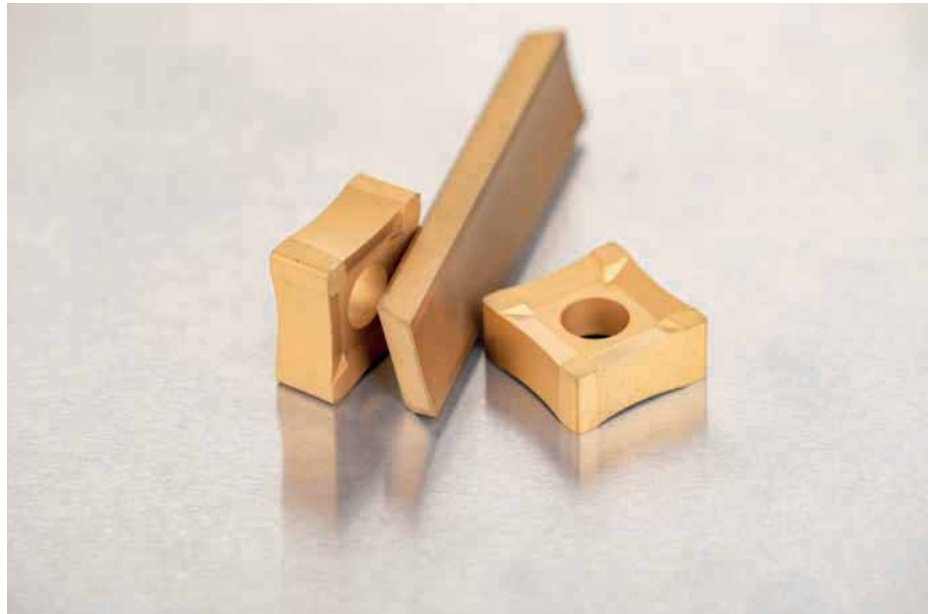
A new insert, additional sizes and accessory tools have all been announced to support the removal of weld deposit created during tube production. This is a process known as scarfing.

These latest additions include a series of positive, screw mounted, single-sided inserts for external scarfing. The SPUB 19 range features eight of the most commonly used radii in the production of thin wall electrical metallic tubing, also known as conduit. Its design provides a smooth chip flow from the point of cut to the chip winder, usually located above the tool.

In addition, Dormer Pramet has added new sizes to its family of negative, double-sided inserts with eight cutting edges for external scarfing. The SNMX 1507-R features a concave top, while the SNMA 1506-R incorporates a flat top. Both inserts are available in 23 of the most commonly used radii for weld bed removal on the external diameter.

With inserts made of tough cemented carbide and featuring a CVD coating, Dormer Pramet's scarfing range is capable of extreme heat resistance. The geometry of the cutting edge provides excellent tube surface quality, high durability and, therefore, longer tool life.

Meanwhile, a new range of shims has been developed to allow the clamping of negative inserts SNMX 2512 and SNMX 1507, with concave top surface, into existing Dormer Pramet holders.



For more information regarding all the latest products launched by Dormer Pramet please visit [www.dormerpramet.com](http://www.dormerpramet.com) or contact your local sales office. Follow all the social posts regarding the new assortments by searching for #EverydayProductivity.

Dormer Pramet is the result of a merger in 2014 between rotary tooling manufacturer Dormer and indexable specialist Pramet. The strengths of each company were combined to create a single platform, providing customers with access to a wide range of high quality, fit-for-purpose products including hole-making, milling, turning and threading tools.

The company is a global manufacturer and supplier of tools for the metal cutting industry. Its comprehensive product program encompasses both rotary and indexable drilling, milling, threading and turning tools for use in a wide variety of production environments. An extensive sales and technical support service operate from 21 offices, serving more than 100 markets worldwide. These are assisted by dedicated production facilities in Europe and South America and a highly developed distribution and logistics network.

It believes in building long-term partnerships, sharing our expertise and



being honest and available at all times. These qualities are deeply rooted in the fabric of our company and every Dormer Pramet employee is charged with upholding and promoting them with pride.

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## ESAB completes brand transition to Exaton name

ESAB Welding & Cutting Products has announced it has finalised the transition to the Exaton™ brand name for all welding filler metals involved with its 2018 acquisition of Sandvik Welding Consumables. Globally, all products now carry the Exaton name. For the EU, Middle East and Asia-Pacific regions, the new naming conventions are as follows:

For stainless products, the Sandvik name has been replaced with the Exaton followed by the EN-ISO classification of the product. For example, Sandvik 25.10.4.L is now Exaton 25.10.4.L.

The nickel-based consumables previously sold under the Sanicro name have been renamed with "Exaton Ni" in front of the current Sanicro number. For example, Sandvik Sanicro 72HP is now Exaton Ni72HP.

"We believe that keeping the alloying number structure will minimise the change for customers and distributors, as will keeping all article numbers the same," says Henrik Calander, general manager for specialty alloys at ESAB. Users can find a

complete list of Exaton product names online. Henrik Calander emphasises that this change is solely related to the Exaton brand transition and only affects product names on labels, packaging and material safety data sheets: "The parameters and performance of Exaton consumables remains the same, so there is no need to requalify weld procedures or specifications.

### Specialty alloy leader

The Exaton portfolio includes solid welding wire and rods, flux cored wire, MMA electrodes, strip electrodes, flux and weld finishing chemical products. Exaton works directly with fabricators and end users in the world's most demanding segments, such as oil and gas, chemical processing, nuclear power generation and cryogenic applications.

Previously completed brand transition activities included the updated brand look, moving the Exaton mobile app, which includes useful interactive calculators and moving material safety data sheets to the ESAB website.



ESAB Welding & Cutting Products is a recognised leader in the welding and cutting industry. From time-honored processes in welding and cutting to revolutionary technologies in welding and cutting automation.

**ESAB Group (UK) Ltd**  
**Tel: 0800 389 3152**  
**Email: info@esab.co.uk**  
**www.esab.com**

## The all-round robot with high payload

Whether its laser or laser-hybrid welding, handling or grinding tasks, the QIROX QRC-30/45/60-PL robot from Carl Cloos is a true all-rounder with a high payload capacity for a wide range of applications.

The six-axis articulated arm robot is used in upright or overhead position and is mounted on a base or directly at a robot positioner. The QIROX QRC-30/45/60-PL robot has a classic wrist where working tools with a weight of up to 30, 45 or 60 kg can be mounted. The optional changing tool at the wrist allows the use of different working processes with one robot.

The QIROX QRC-30/45/60-PL is characterised by high dynamics, a slim product design and a low net weight. By using carbon components, vibrations on the mechanics are optimally damped. Users benefit from the repeatability, the long service life and long maintenance intervals. The robot also impresses with a big working envelope of 4,500, 4,200 or 3,900 mm and little floor space.

The mechanical interface on the third axis

body allows the attachment of tools and wire drives up to 40 kg. Due to the integrated media supply system, a media box can be integrated on the robot shoulder without the need for an additional cable loom. The externally guided cable loom allows quick repair by plug & play in the case of service. Furthermore, extensions and retrofits are possible at any time due to the modular design.

Since 1919, Carl Cloos Schweisstechnik GmbH is one of the leading companies in welding technology. More than 800 employees all over the world realise production solutions in welding and robot technology for industries such as construction machinery, railway vehicles, automotive and agricultural industry. The modern Cloos welding power sources of the QINEO series are available for a multitude of welding processes. With the QIROX robots, positioners and special purpose machines it develops and manufactures automated welding systems meeting the specific requirements of the customers. The



The QIROX QRC-30/45/60-PL is characterised by high dynamics, a slim product design and a low net weight

special strength of Cloos is in its widely spread competence. From the welding technology, robot mechanics and controller to positioners, software and sensors, the company supplies everything from a single source.

**Carl Cloos Schweisstechnik GmbH**  
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**Email: info@cloos.de**  
**www.cloos.de**

## How to save costs and resources when waterjet cutting

The StM OneClean system, with a module for fully automatic recycling of abrasive sand, makes waterjet cutting systems even more profitable and at the same time, more sustainable

Waterjet cutting systems need water and abrasive sand to operate. The latter is the biggest variable cost factor in waterjet cutting and a scarce resource. Waterjet cutting systems manufacturer StM identified the potential here and developed the OneClean modular system for the protection of this natural resource. The abrasives recycling module of the OneClean system makes it possible to recycle more than half of the garnet for additional cutting tasks. That saves procurement, disposal and transportation costs, which make amortisation possible within about three to five years at an approx. annual abrasive consumption of 50 tonnes.

### The recycling technology

Using a patented process, a specific hydrofilter screens out coarse and fine fractions from the used abrasive into the collection tank of the basic module whereby too coarse or too fine constituents are discharged.

The used abrasive is dried energy-efficiently and automatically mixed with new abrasive from the abrasive container in order to ensure high abrasive quality. With this system and depending on quality and cutting speed, up to 55 percent of the used abrasive can be reused. The expenditure of energy required for recycling the abrasive is at 3-6 kW minimal.

"Cutting quality remains the same compared to new abrasive," says Jürgen Moser. "That not only protects the environment, but also the budget."

Abrasive recycling is one of five linked modules of the OneClean system. The system can be put into operation with a small investment and expanded as required at any time. Without exception, all modules are high-quality branded components which have been jointly developed with StM. A consistently solid construction as well as central frame of stainless steel and panelling of aluminium, guarantee the highest wear resistance and mechanical resilience.

### Space-saving and compatible

The StM OneClean system stays so compact that it can be used directly at customers'



plants even if they are using a system from an external contractor. All modules are built to take up the smallest possible space and the energy consumption is five times less than that of comparable systems. By this means, StM is able to demonstrate clearly that cost efficiency is by no means a contradiction in terms of sustainable and environmentally compatible operating methods.

StM is a leading supplier of waterjet cutting systems based in Eben, Austria, Schweinfurt, Germany and Appenzell, Switzerland. For more than 25 years, the traditional company has developed integrated solutions, mainly for the steel, aluminium, metal, plastic, stone and glass industries, which are most notable for their efficiency, ease-of-use and resistance to wear. Since 2018, the company has also held the sole production rights to BYSTRONIC waterjet cutting systems. StM stands for standard CNC-controlled portal systems in all dimensions and for all applications. In addition to economy, standard quality and excellent customer service, StM attaches particular importance to innovative modular system technology. The brand manufacturer thus ensures that its individual manufacturing processes are continually matched to the latest requirements of its customers.

The Group has locations in Austria, Germany and Switzerland, employs a total of 70 people and is represented in countries worldwide.

Passion, know-how and an insatiable appetite for innovation have made StM a leading international supplier of waterjet cutting systems. Its innovations turn the concept of cutting using the force of the waterjet into a unique and reliable precision technology.

Without exception, the company utilises commercially available branded components which guarantees both short lead times and minimum maintenance expenditure. Nevertheless, should a minor fault still occur its professional and personalised customer service can help to solve the problem in the shortest possible time.

The company does not only want to generate customers but gain long-term partners who it supports with help and advice way beyond the sale itself.

Jürgen Moser concludes: "Our objective is to provide the best service in the whole industry."

**StM Stein-Moser GmbH**  
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ALL YOUR NEEDS,  
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## The Combi

**Small batches, volume production, high precision, curved shapes, sharp angles.** Whatever your sheet metal product, a **Prima Power Combi machine** is a perfect solution: with a large range of tools, customisable configuration and automation options, **it's the most flexible, integrated punch-laser system** to do everything you need on one machine.

**What can a Combi do for you?**



[www.primapower.com](http://www.primapower.com)



# Robots as efficient tube bending machines

transfluid has a new generation of machines

Robots have already been used for some time as efficient and flexible bending machines to process tubes. These systems are constantly developed further and improved. For the experienced engineers at transfluid this means first of all to make the software user-friendly, so it is possible to work in an efficient and professional way. These bending systems from the high-tech engineering company can take isometrics data and generate bending data without separate programming of the robot system.

### The next stage has been designed and improved

transfluid has now designed the next step in the development of its range of tube bending robots and improved it again. The online connection to CAD systems has always been possible, which reduces the setup time a lot. Another important aspect is to simplify the software connection because of the robot programming capabilities of each customer.

The latest generation of machines can process isometrics data online. There are also positions stored in the control system, for where the piece is picked up and dropped off. In addition to this, it is also possible to retrieve the position for the necessary supports for long tubes. Because of this, a complete new complex bending



geometry can be programmed and bent quickly, in max. 30 minutes. This includes the setup of the bending tools.

### Synchronised and coded for clear identification

The transfluid bending cells with two robots bend long tubes at both ends. This way

tubes can be supplied with forming, hoses or connection systems. The preparation and cleaning of the tubes becomes a lot easier. It is much better to process straight tubes, when the bending machine can bend at both ends. These benefits can be enjoyed both when bending with one or two robots.

With a setup with two robots it is possible to process tubes of up to 6,000 mm without any problems. The two robots work in a synchronised way. Additional equipment like clamping or support devices also synchronise with the processing robot. The robots recognise the component with a code, generate the bending sequence and they can also choose between different radii and diameters. It is possible to work with a total of six different tube diameters or radii without having to change the dies.

### Advanced processing, greater output

With the new developments and improvements from transfluid, a production cell with two robots can do more than bend a tube at both ends: each of the bending robots can also process different geometries. Both machines are working all the time and the system can be used efficiently and with a significantly higher output.



## Bending and handling without costly programming

The latest generation of transfluid bending robots also offers safe handling as the grabbing coordinates on the tube for the pick-up from the magazine and for the dropping off can be retrieved from the pre-programmed parameters. This means that the user has to do almost no programming of the bending sequence or the handling steps. The machine simply refers to pre-loaded data.

Even tubes with long lengths, which are nearly impossible on conventional bending machines, can be processed without any problems, as the long sections will not cause any collision problems. This is possible, because the last bending is done on the "floating" tube, just before the drop off. The whole system is operated by a bending machine control unit. This means it is possible to work both with X, Y and Z coordinates, but also with lengths and bending angles, just like a standard bending machine.

## Short learning curve and fast setup

It is not necessary to have special



knowledge of robot programming. In order to keep the setup times as short as possible, the robots have pre-programmed tool settings, including axes for the position. This keeps the setup time short for the operator. With the latest generation of bending robots transfluid has once again expanded

the possibilities of tube processing and made it more efficient.

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## Automated bending of sheet metal

Folding of sheet metal can be automated using a new bending centre from Swiss manufacturer, Bystronic. It lowers production costs, promotes accuracy and consistency, and at the same time increases flexibility for dealing with batch sizes from small runs to large series.

Bending Cell is available in the UK through the group's Coventry subsidiary. It is based on the company's Xpert Pro press brake served by a 7-axis robot that is able to cope with a wide variety of component sizes and shapes.

A gripper changer, tool changer and magazine, and material storage unit may be either factory-fitted or retrofitted at a later time, allowing not only component handling but also gripper and bending tool exchange to be autonomous. The modular system enables existing Xpert Pro machines in the field to be automated.

Intelligent offline programming software saves time by determining the optimal bending sequence for every job. The program for the next order can be downloaded without interrupting the current process. The cell can accommodate

production of kits of parts needed for a complete assembly.

While the robot is bending, staff can perform other tasks such as the supply and removal of sheet and parts, or operation of a laser cutting machine or welding system. The cell is simple to use, as both the robot and press brake are controlled using the same touch screen. The ByVision Bending user interface provides the user with an overview of the current job status and the remaining production time, even optionally on mobile devices.

Repeatability of bending is high, ensuring top quality fabrication and assembly. A precise angle measuring system known as LAMS ensures that all critical parameters are compensated during bending, from spring-back to temperature fluctuations on the shop floor.

Bending Cell is available as a turnkey automation solution for Bystronic's Xpert Pro 100, 150, 250, and 320 press brakes. Maximum press capacity is 320 tonnes and bending length is up to three metres. Five robot types are available with handling capacities ranging from 90 to 270 kg.



Everything from installation and commissioning to programming and after-sales support including maintenance, service and future system modification, if required, are provided from a single source.

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# Quintus Technologies delivers high pressure fluid cell press to Piper Aircraft

Robust demand for new trainer aircraft drives investment in flexible forming technology

Piper Aircraft Inc. has installed a high pressure Flexform™ press from Quintus Technologies in its manufacturing facility in Vero Beach, Fla. The addition of the press reflects the growing market for new trainer aircraft, spurred by the current pilot shortage and upsurge in training needs.

"Piper is the only aircraft manufacturer that offers a complete line-up of training aircraft, and with a global pilot shortage we have seen a resulting increase in demand for our training products. With this in mind, it is paramount that we have modern, reliable, and cost-efficient equipment to help us meet the increase in our production," states James Funk, Piper's chief operating officer. "With its capacity and ease-of-use, the new Quintus press is helping us manage our growth while controlling costs and improving quality."

The Quintus QFC 0.7x1.8-800 fluid cell press applies flexible forming technology to the production of sheet metal parts across the entire Piper line of eight aircraft models. Its versatility supports thousands of part numbers, many with complex geometries or free-form surfaces. The high forming pressure -800 bar (11,600 psi) ensures close-tolerance parts direct from the press, with little or no secondary hand work required.

With a work area of 27.6 x 73 inches, 700 mm x 1,800 mm, the press introduces several production efficiencies by eliminating forming operations, intermediate heat treatments, and manual pre- and post-forming operations. The advanced Flexform process utilizes a unique combination of a single rigid tool half, which operates in conjunction with a flexible rubber diaphragm under uniform high hydrostatic pressure, to form sheet metal parts with great accuracy and repeatability. This design approach generates significant tool cost savings and speeds up tool production, especially for intricately shaped components.

Ed Williams, general manager for Americas, Quintus Technologies, says: "We believe the ability to combine a higher level of forming die design with modern high

pressure forming technologies will provide substantial time and cost savings as Piper ramps up its production,"

"As a manufacturer with a growing production schedule, it is important that we have equipment that can support our needs with minimal downtime or issues," adds James Funk. "The press that we purchased from Quintus has exceeded our expectations. The entry into service has been seamless. Furthermore, the service and support have been exceptional."

Piper supplemented its press order with a long-term Quintus Care Program, a rigorous agreement that ensures flawless production, press operation and maintenance. The program provides for application support, high availability of spare and wear parts, along with guaranteed and prioritised technical support. It also includes both annual press inspections to maintain its status and annual training and recertification of Piper personnel to maintain and elevate their skills. The Quintus Care Program allows the aircraft manufacturer to concentrate on its core business, with the assurance that the press continues to produce quality parts in a timely fashion. "This is the key to filling orders and maintaining product quality," James Funk adds.



"We are very pleased to be working with Piper as it advances its production volume to meet near-record demand," says Jan Söderström, CEO of Quintus Technologies. "It is an exciting time for the company and we are pleased to play a supporting role in its successful operations."

Quintus Technologies is a leader in high pressure technology. The company designs, manufactures, installs, and supports high pressure systems for sheet metal forming and densification of advanced materials. Quintus has delivered over 1,900 systems to customers within industries such as aerospace, automotive, energy, and medical implants. The company is headquartered in Västerås, Sweden, with a presence in 45 countries worldwide. For more information, visit:

<https://quintustechnologies.com/>

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## SPI Lasers launches variMODE

### Adaptable laser beams to transform your productivity

SPI Lasers, the UK based designer and manufacturer of fibre lasers has announced the launch of variMODE a switchable beam delivery feature now available as an option on all its 3 kW - 10 kW high power CW fibre lasers.

variMODE allows users to tailor its fibre laser system to optimise the beam characteristics, including spot size and beam profile, specific to their application, whether that be cutting, welding or piercing.

Based on an internal, all-in-fibre device that modifies the spatial modes in the delivery fibre, this innovative approach uniquely maintains the laser output totally through the central core of the delivery fibre, removing the need for complex and expensive additional optical components and ensuring maximum power is maintained across the beam profile, regardless of the chosen mode.

The two modes currently available have been carefully selected to address a wide

range of materials processing applications. Low Beam Parameter Product (BPP) mode profile is excellent for fast cutting of thin metals, especially bright highly reflective ones, but also for producing high-speed high-quality pierces in thick sheets while the high BPP mode gives excellent, smooth cut edges at good speeds when cutting thick metal sheets, especially mild steel.

Having both modes available means there is no need to compromise on the laser beam quality when configuring your laser. The switching time from low to high BPP is typically around 30 ms, which is fast enough to easily change between piercing and cutting applications 'on the fly'.

Mark Richmond, product manager for high power CW lasers states: "variMODE will allow our customers to quickly change the beam quality of their laser, selecting the best Beam Parameter Product value for each manufacturing process, allowing users to work more cost efficiently than ever before. At SPI Lasers we are committed to providing the best value and highest quality products



for our customers. variMODE is another perfect example of how we bring this to life.

We've created a great video to bring the feature to life and make it easy to understand, head over to our website to watch it for yourself."

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## Micro waterjet bridges the gap between EDM and Micro Laser

Waterjet cutting is a common method for processing parts in high density materials such as aluminum, stainless steel, titanium and carbon composites. The FAWJ cutting process bridges the gap between micro laser and EDM cutting and brings waterjet cutting into the field of micro part processing.

To enable such levels of precision you require a cutting head and cutting process for FAWJ cutting and a machine built for extreme accuracy. The NCM 10 Micro from Water Jet Sweden fulfils both of those requirements.

The first micro waterjet cutting head was developed by Water Jet Sweden in 2008. It is a high precision cutting tool producing one of the most precise abrasive waterjets in the world. The unique cutting head enables an abrasive jet diameter down to 0.2 mm. The FAWJ cutting process requires very fine abrasives of 230-240 mesh and a special CNC controlled dosage abrasive feeder.

To reach the levels of accuracy required in micro part manufacturing, the NCM 10 waterjet has a number of unique design

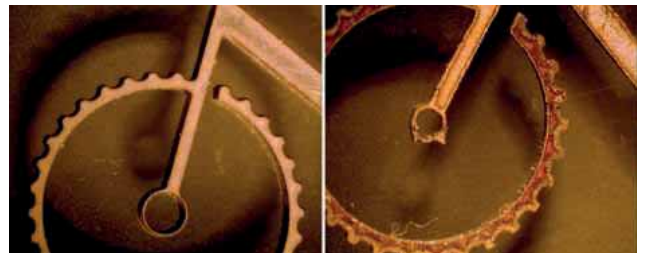
features to create a rigid table that withstands temperature fluctuations:

Mineral Casting Bearlit table frame is a table frame made of a composite material with exceptional stiffness that withstands vibrations and temperature fluctuations. The frame is integrated in the machine construction and motion system as a complete unit.

Rubber suspended stainless steel water catcher is a free-standing catcher solution that prevents vibrations and temperature variations from influencing the cutting process, stainless steel ensures it is maintenance free.

Additionally, with the Renishaw Invar Scale in X and Y and a Renishaw Absolute Linear Encoder fitted in both X and Y axes, you have a micrometre scale with an extremely low expansion coefficient and ultra-high resolution.

The palettised cutting table makes it easy to install fixtures and presses for different



types of machining. Maximum table size is 1x1 m which covers most cutting applications. The cutting table is fixed into the table frame to enable ultra-high precision cutting.

"There are many suppliers who state that they offer micro cutting machines, but not many can offer a true micro part cutting tool with 0.2 mm incision combined with  $\pm 0.008$  accuracy," says Tony Rydh, co-founder and CTO at Water Jet Sweden.

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# Sales milestone delivers a 10-year birthday present for Worcester Presses

A Black Country manufacturing specialist is celebrating 10 years of supplying hydraulic presses in the UK by hitting a major sales milestone.

Worcester Presses, which employs 14 people at its works in Dudley, has recently installed its 50th hydraulic press into PAB (Coventry) to help it cope with an increase in orders from the automotive and aerospace sectors.

The sheet metal and prototype experts have taken a Yeh Chiun 300 tonne H-Frame hydraulic press that is capable of delivering the precision accuracy crucial in producing pressings and metal grills that will be used in supercars and a host of Aston Martin models.

Praised for its flexibility and power, the machine's relatively small footprint fits perfectly within the company's factory and the latest control software means programmes can be stored and called upon quickly.

This latest install marks Worcester Presses' best ever year of hydraulic press sales, with this type of machine now accounting for 20 percent of the firm's £2.2m turnover.

"There is a distinct lack of domestic specialists in this area of press expertise and we are really benefitting from our decision

to invest in our growing range," explains Russell Hartill, director of Worcester Presses.

"While many of our competitors have stopped trading, we have thrived by offering customers access to a range of C-Frame and H-Frame models, varying from 20 tonnes right up to 2,000 tonnes. This is backed up by our ability to customise machines to suit specific applications, a comprehensive service package and the biggest stockholding of spares for this equipment in the country.

"Hydraulic presses offer great versatility and are suitable for low, medium and high-volume production, especially components that are used in assembly and those that are deep drawn.

"The technology has come on a lot since we first sold them in the UK, with many of our presses featuring touch screen controls, improved programme memory and another major benefit is the remote access facility, where our service department can directly interrogate the control system as required for offsite support."

PAB (Coventry) is a perfect example of a company that really plays to the strength of the hydraulic press, producing a range of complex parts for the automotive and aerospace sectors, two of the most demanding markets around.

Unlike its mechanical counterpart, this type of machine can generate full pressing force anywhere in the stroke and allows the user to control job parameters, including travel distance, pressure and return position.

Hydraulic force can also encourage creative and dynamic engineering, which is directly suited for prototyping and low volume, complex production.

Mark Brazier, CEO of PAB (Coventry), adds his support: "The YCT-300 Worcester hydraulic press is a great addition to our capability and is directly involved in added value work we complete for a number of car manufacturers and some sub-frame components for aerospace.

"Installation was smooth and training for our operators was completed quickly, meaning the hydraulic press could have an immediate positive impact on our output.



We have been very impressed with its versatility and the fact we can quickly set it up to take on new and diverse jobs. Tool life is also very good.

"We have been working with Worcester Presses since an engineering show five years ago and have always received a great service, from understanding our desired application and then matching it to the right machine. The service and maintenance packages are also first class."

Established in 1949, Worcester Presses has seen strong demand over the last twelve months from customers involved in the automotive, aerospace, construction and medical sectors.

The Dudley firm supplies a host of mechanical and hydraulic presses from Chin Fong and Yeh Chiun, as well as growing its range with Tomac coil handling equipment and Lee Yih press transfer lines.

As part of its expansion, it has recently invested in a new CNC lathe to help it with machine modifications and to produce spares for its extensive stockholding.

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