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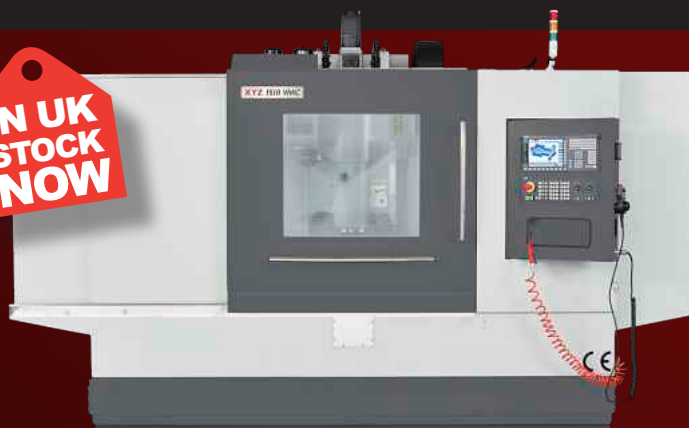
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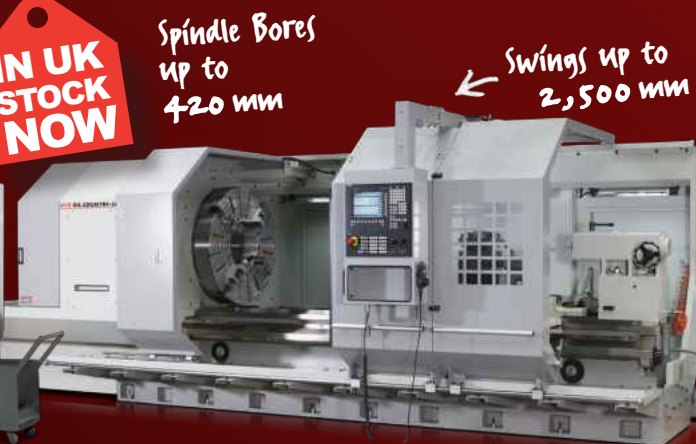
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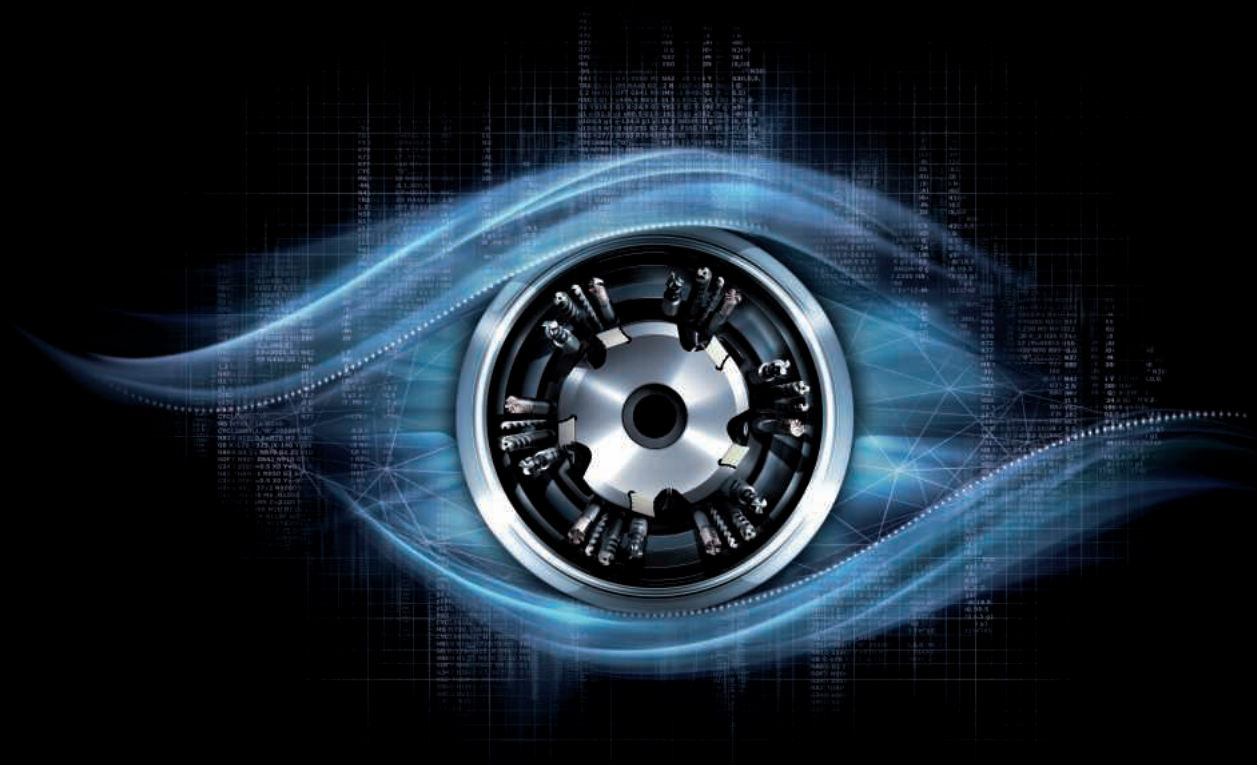
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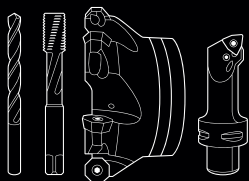
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The evolution in trochoidal milling

New CircularLine CCR end mills from WNT increase efficiency with intelligent machining strategies and process optimisation to deliver shorter machining times and an extended tool life. These strategies include trochoidal milling, where the new CircularLine CCR end mills from WNT excel in producing components even faster.

WNT's CircularLine CCR end mills are the first choice for optimum results, with the trochoidal milling reputation enhanced by the use of WNT's Dragonskin coating, that helps create a robust and wear-resistant tool able to withstand large temperature fluctuations. The end mills also boast a special chip breaker that is ground into the cutting-edge geometry that helps to generate swarf only 2 x D creating optimum chip removal, even for problematic materials. Two versions of the WNT end mills are available: one for universal applications and another specifically for the machining of aluminium. While the six flutes of the CCR-UNI



ensure smooth operation and a high material removal rate, the four flutes of the CCR-AL ensure a high depth of cut. They are available in 3 x D steel and up to 4 x D aluminium cutting lengths. All can reach cutting depths that correspond to their cutting lengths.

With experience proving that it is possible to use significantly higher cutting data when trochoidal milling with CCR end mills compared to conventional machining processes, machining times can be greatly reduced. Even applications that were previously considered to be very difficult can be dramatically improved. For example, problems were always encountered with chip evacuation when cutting materials such as stainless steel 1.4404, Duplex-VA. With WNT's CCR end mill this material can now be cut dry, minimising the thermal shock effect.

As a result, a considerably longer tool life is achieved in comparison to wet machining. In one application, the conventional machining time for the workpiece was reduced from 12 minutes to 5 ½ minutes and, the general service life was tripled. These figures clearly show what combining the optimum tool with the right machining strategy can achieve.

A visual representation of the gains that can be made using CircularLine CCR end mills and the trochoidal machining process can be seen at: www.youtube.com/watch?v=uEx_5d18ss0

Anyone interested in the trochoidal machining using the CircularLine CCR end mills can contact WNT (UK) via its website or call to request a visit by one of WNT's specialist technical sales engineers.

WNT (UK) Ltd Tel: 0800 073 2 073

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

Demand for engineering subcontractors is on the rise

The subcontract market is steadily increasing year on year and with a strong demand for machining, up 6.7 percent, the figures have continued to set a positive trend in the second quarter of 2017.

With different processes such as fabrication up 3.4 percent and electronic and plastic moulding up by 24 percent from the previous year, all making a positive impact, it is clear how essential the subcontract market is to engineering, manufacturing and the various industries they serve. Advanced Engineering 2017 is a key ingredient in maintaining this growth.

Advanced Engineering 2017 is the UK's largest meeting place for engineering subcontractors. Organised by Easyfairs, the show takes place on 1st to the 2nd November, at the NEC, Birmingham. It is the place where the UK supply chain meets face-to-face with engineering management, spanning: process, control and plant industries; R & D; design; test; production & procurement from OEMs, integrators and top tier industry players.

Registration numbers for visitors this year are nearly 50 percent more than at the same time last year, they will be coming from a range of engineering specialisms, including: measurements & monitoring, process control, drives and controls, sensors and systems, automation, fluid handling, food processing, machining and many more from a range of sectors.

Alison Willis, industrial divisional director at Easyfairs, says: "We're very excited about this year's exhibition as the market for subcontract engineering services is growing at a very healthy rate. Advanced Engineering 2017 is the place to find new suppliers and customers, and meet with existing contacts, to make this growth continue.

"We will bring together the latest

advances in engineering, and just importantly the people who buy and provide engineering services."

Whether you are a visitor or an exhibitor, Advanced Engineering will not only provide you with a business forum and supply chain showcase for your own sector, but will also introduce you to new opportunities in industries using related technologies and services.

Advanced Engineering 2017 will enable visitors and exhibitors to meet and do business, not only within their own sectors, but in other, less familiar markets that they would not normally encounter.

Co-locating as part of the show are five zones: Aero Engineering; Composites Engineering; Automotive Engineering; Performance Metals Engineering and Connected Manufacturing which is new for 2017.

Aero Engineering

Aero Engineering is the UK's only event that is solely dedicated to aero R&D, design, test, inspection, production & assembly. Addressing structures, propulsion and systems, it brings together global OEMs and top tier manufacturers to source from all levels of the engineering supply chain. Supported by ADS, NATEP, and all regional associations, Aero Engineering additionally brings some of the latest innovations and case studies to the show floor.

Composites Engineering

The rise of composite materials continues across an ever-increasing number of applications. The advances provided by composite materials within automotive, aerospace, manufacturing, construction and oil and gas, to name just a few, are revolutionising businesses and benefiting millions of people. With the industry

showing no signs of slowing down, the Composites Engineering show has already established itself as one of the world's most important composite raw material, design, processing and applications events.

Automotive Engineering

Following on from the successes in 2015, 2016 was another record year for the UK new car market. Registrations hit yet another high, exceeding the expectations of many and maintained steady growth throughout the year. In step with this trend Automotive Engineering continues its growth as the UK's dedicated event for manufacturers and the automotive industry supply chain, covering all areas of the industry, from R & D, through design, test, and production.

Performance Metals Engineering

Reflecting the demand for lightweight and high-performance metals across many industries, the UK metals sector boasts more than 11,000 companies, employing 230,000 people directly and is responsible for a further 750,000 jobs outside of these positions. Performance Metals Engineering provides the perfect opportunity to identify the latest business opportunities, and developments in design, processing & production, and to meet key figures at the heart of the industry.

One of the hubs which is being expanded this year is Enabling Innovation hosted by Magna International, a leading global automotive supplier. This is a dedicated area for up to 50 carefully selected SMEs and micro businesses which are at the early stages of their development, perhaps prototyping.

New to the show this year is the Connected Manufacturing Zone, which will catalyse the business and technology opportunities that exist between innovators, customers and suppliers, including those within big data, automation and more. This marks a significant step in the revolution of Industry 4.0.

The keynote speakers for the Advanced Engineering 2017 Open Conference have been announced and will include representatives from major OEMs and niche

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SMEs. Topics will include how specific engineering problems have been overcome, as well as more strategic issues such as the fourth industrial revolution, Brexit, additive manufacturing and advances in aluminium engineering.

There will be presentations from Airbus, EEF, ADS, Magna International, The Society of Motor Manufacturers & traders (SMMT) and GKN and Meggit Modular Modifiable Manufacturing (M4) and others.

How to succeed at Advanced Engineering 2017

Most companies view exhibiting at Advanced Engineering 2017 as part of a wider marketing or supplier strategy and when attending the show with so many opportunities to learn and do business, it is important to prioritise. But how do you do that, with hundreds of exhibitors and thousands of visitors?

Define your main reason for being there. Think about exactly what are you going to

do now to make the most of every opportunity. Network with existing clients and potential customers, the opportunities are immense. The team you select to represent your company, whether exhibiting or visiting, is key and they must be fully briefed in advance of the objectives.

Set up a promotional campaign before Advanced Engineering 2017, including advertisements, tweets, invites and mailshots. Your customers and suppliers will be prepared to see you there and be considering how you can meet their engineering requirements.

Grab the attention of visitors and engage. You're in a fast moving and sometimes pressured environment so you have just a few seconds to grab a visitor's attention and ultimately generate a lead. "Failure to prepare is preparing to fail," said inventor and scientist Benjamin Franklin. That is what it boils down to, preparation. The more prepared you are, the more likely you are to achieve your objectives.

This is also how you make the most of Advanced Engineering 2017, with preparation, engagement and achievement. Keep those three key aspects in mind throughout the planning, execution and reflection upon your show experience and make the most of it.

Advanced Engineering 2017 has also announced a competition for all exhibitors with prizes for those who bring the most visitors to the 2017 show through registering using their trackable link. The two exhibitors who bring the most visitors will win a free six square metre stand in the 2018 show and a free full-page advert in the 2018 show guide.

For more information about exhibiting or to secure your free ticket for the show, visit: www.advancedengineeringuk.com. You can also find regular updates on Twitter via #AEUK17.

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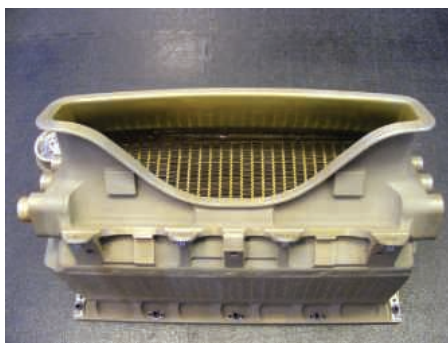
Parts cleaning is a quality-critical step in manufacturing and the requirements regarding health, safety and environment (EH&S) as well as the necessary level of cleanliness continue to rise. This is true for all industries, but especially in the aerospace Industry. When it comes to choosing and using the right solvent, SAFECHM offers not only a complete product portfolio for solvent cleaning, but also comprehensive services, from consulting, laboratory services, service elements and training to the innovative chemical leasing model COMPLEASE. With its products and services, SAFECHM has convinced aerospace customers such as HS Marston.

Since its foundation in 1992, SAFECHM has been developing innovative and sustainable solutions for the use of chemicals in industrial parts and high precision cleaning. According to the principle of "Equal solves equal", both chlorinated solvents or modified alcohols can be the preferred choice for polar and non-polar impurities such as machining oils, greases, waxes and resins. To answer the important question of which solvent to use, SAFECHM considers the entire production environment. On the one hand because substances carried into the solvent bath play a crucial role, on the other hand, the CHEMAWARE laboratory services including

solvent analyses and oil compatibility tests support the decision process and the optimal combination of the service elements.

Better cleaning quality while lowering costs at HS Marston

HS Marston Aerospace Ltd, a UTC Aerospace Systems Company, has optimised its parts cleaning with DOWCLEN modified alcohol solvent and COMPLEASE Chemical Leasing. The core



Heat exchangers from HS Marston are used in the commercial and military aerospace markets, motorsport and electronics industries

competence of the HS Marston site is the development and manufacture of a wide range of heat transfer and fluid management products and services for the commercial and military aerospace markets, motorsport and electronics industries. Cleaning of heat exchanger components is a quality-critical process step. The complex geometries make it difficult to get these parts clean and dry which is necessary for the subsequent brazing. For HS Marston, DOWCLEN 1601 turned out to be the optimal solution. It is a distillable solvent based on modified alcohols and has a wide range of approvals in the aerospace industry, for example from Rolls Royce.

Thanks to its lipophilic and hydrophilic properties, DOWCLEN 1601 enables the removal of oils and greases as well as the elimination of polar contaminations like cooling emulsions or solids such as salt, particles and abrasives, in a reliable and reproducible manner. The solvent is also characterised by low toxicity and good biodegradability. Due to its specific properties, the solvent enables customers to

meet high demands on cleaning quality whilst ensuring that the corporate requirements concerning HS&E are achieved.

COMPLEASE, the chemical leasing concept from SAFECHM, has also proven an ideal solution for HS Marston. The customised leasing package not only includes the supply of fresh solvent and take-back of used solvent, but also consultancy, support and various services



on a continuous basis. Among these is the CHEMAWARE Solvent Training for all employees involved in the cleaning process which is performed once a year. Staff members are trained on the safe handling of DOWCLEN 1601 as well as on optimising the process by monitoring the solvent stability and quality with the MAXICHECK DCL-1N Test Kit. All in all, cleaning costs at HS Marston could be significantly reduced while reaching the HS&E goals.

COMPLEASE Chemical Leasing from SAFECHM includes the supply of fresh solvent and take-back of used solvent, but also consultancy, support and various services on a continuous basis and enables the sustainable use of chemicals, cost savings, and simplified financial planning.

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Rapid supply and relocation of a machining centre saves the day

A catastrophic failure of a 5-axis machining centre, coupled with a requirement to continue supplying 12 aircraft seat tray table assemblies per day that were being produced on it, is a nightmarish scenario for a subcontractor. It was exactly the problem Weymouth-based FGP Systems faced last autumn.

A solution was quickly found. It was to buy a new, German-built Hermle C 400 machining centre, which was supplied in September 2016 by sole UK agent Geo Kingsbury in a lead-time of two weeks. After commissioning and training, the 5-axis, vertical-spindle machine was producing parts within three weeks from time of order. Three months later, the supplier moved it to a new, permanent location in the Weymouth facility over a period of just four days prior to Christmas.

Simon Griffiths-Hughes, director of Engineering at FGP Systems, says: "No other potential source of a quality 5-axis machining centre could react so quickly. 14 to 16 weeks is a normal lead-time from a factory if a machine is built to order, but Geo Kingsbury had the Hermle C 400 in stock in its Gosport showroom.

"As luck would have it, the machine was perfectly specified for our requirements with spindle nose probing, laser tool setting, HSK 63 tools, an extended, 87-station magazine and an 18,000 rpm spindle to allow efficient machining of aluminium.

"Before we placed the order we spoke with several UK users of Hermle equipment, from blue chip firms to small subcontractors, and all endorsed the brand. We were also mindful that we did not hear any negative comments."

Nigel Pitman, managing director of FGP Systems, says: "To change from the incumbent supplier of our nine 5-axis machining centres to Hermle was a huge decision for us.

"We had been talking to Geo Kingsbury for about 18 months regarding purchasing a C 42 U 5-axis machine for another project, which did not go ahead.

"So we had already done a lot of research, which included a visit to the German factory. You can see the machines are built well, including the simple things. The trunnion



bearings are much bigger than on most 5-axis machines, for example.

"Even something straightforward like the swarf conveyor impressed us. Some manufacturers provide a swarf conveyor that is too high and narrow for efficient removal of chips, whereas Hermle's conveyor is low-rise and as wide as the machining area."

The C 400 has excelled especially in respect of the high surface finish being achieved on machined components. It was previously causing FGP Systems some difficulty, as the grey anodising stipulated by the customer tended to show up every machining mark left by scanning with a ball nose milling cutter. Many hours of manual polishing were needed to remove the marks. Now components go straight from the Hermle to anodising without any further work, such as the consistency of surface finish.

The C 400 is a model from a new, lower priced machine series from Hermle that sits alongside the manufacturer's core range. The machine has the same modified gantry design and mineral cast bed, offering rigidity, low vibration and high accuracy. Quality is therefore equivalent; the only proviso is that fewer options are available, a limitation that does not affect the range of applications at FGP Systems. The standard CNC system is Heidenhain's latest milling control, the TNC 640.



There is no turning capability on the rotary table of the C 400, but the TNC 640 has the option of software for interpolation turning. It exploits circular movement using the X and Y axes, synchronised rotation of a turning tool in the spindle and simultaneous feed in Z to single-point profile-turn circular features on the inside or outside of a static component on the table. With a lot of big flanges requiring recesses going through the machine shop at Weymouth, the extra software is likely to be an early addition when the tray table contract is migrated to an automated production cell at the factory and the C 400 is deployed onto other work.

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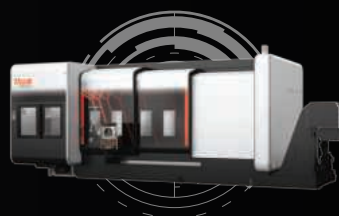
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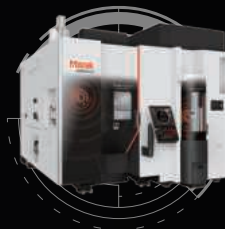
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New 5-axis horizontal machining centre

A new, horizontal-spindle machining centre for 5-sided and simultaneous 5-axis machining, the HF 5500, was launched by Heller at EMO 2017 alongside the smaller HF 3500, which was introduced last year. With a 900 x 950 x 900 mm work envelope and a maximum pallet load of 750 kg, the larger machine offers approximately 200 mm extra travel in X, Y and Z plus 200 kg additional load capacity.

HF series machines are intended for highly productive, medium and large volume production in the automotive industry and its supply chain, as well as in the machine building industry. Optionally, productivity can be boosted with a 'Speed-Dynamics Package', which shortens chip-to-chip times by 10 percent, and a high-speed lift-and-swivel tool changer that reduces idle times further.

The machines have direct-drive rotary A and B axes integrated into a swivelling rotary table that has a low moment of inertia, allowing highly dynamic movements. The counter bearing supporting the AB axis is a unique selling point, according to the manufacturer, as in combination with the YRT bearings it helps to achieve extreme rigidity under high loads.

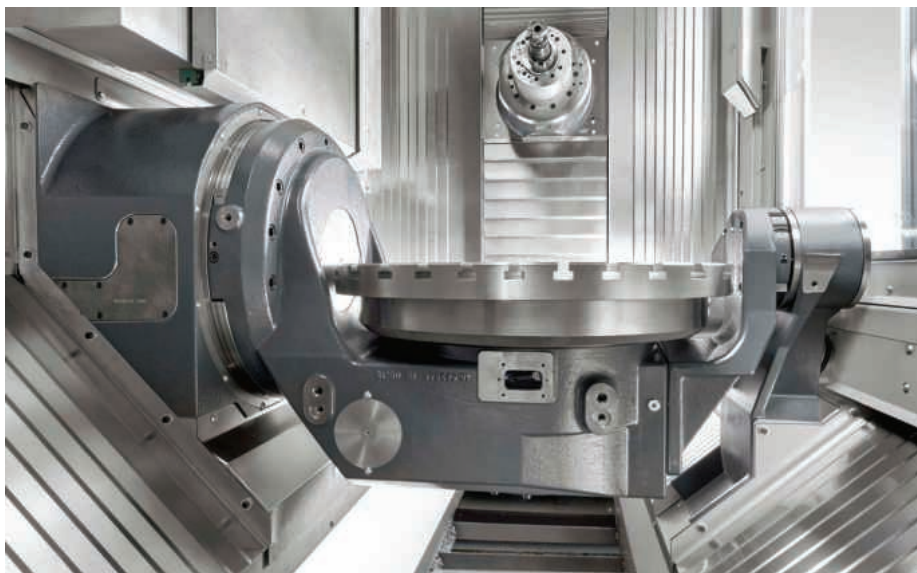
Large component sizes can be accommodated due to the generous interference contour, while still maintaining a +30 to -120-degree table swivel. With certain restrictions, the swivel range can be increased to 225 degrees. Whereas conventional 5-axis machining centres are generally configured for single-part

clamping, Heller's HF series allows multiple part workholding or one very large component such as a transmission case to be secured.

Flexibility of use was another priority during the development phase, which is why the HF series is available with a choice of four different in-house manufactured spindles, with either an HSK-A63 or HSK-A100 taper, offering speeds up to 18,000 rpm and torques to 452 Nm. Versions of the machine are available for table loading or with a twin pallet changer.

The free chip fall of the horizontal-spindle design is augmented by steep side walls and a centrally positioned chip conveyor, covers being of stainless steel. The new Heller Operation Interface has a 24-inch

touchscreen and offers quick access technology in the control, while an optional camera in the work area supports setting and monitoring. Connectivity to Heller automation systems and flexible integration into existing production lines are possible.



Heller's Industry 4.0 initiative

Increasing productivity through consistent Industry 4.0 practices, which the company calls HELLER4Industry, was another theme of the stand at EMO. Core aspects are supplementary machine functions, on-demand services and enhanced maintenance. The importance of ease of operation, customised workpiece manufacturing and enhanced evaluation of existing data will be stressed.

HELLER4Operation is an easy-to-use, operator-oriented user interface for the

company's machines. The use of touchscreen controls at the tool/workpiece loading station promotes rapid and easy operation, facilitates the manufacture of individualised products and helps to integrate production into the value chain.

The HELLER4Services interface focuses on transparency of digital manufacturing and maintenance processes. The module forms the basis for evaluation of machine data and statistics, supporting a reduction in downtimes. Additionally, the visualisation of specific information such as status displays of axes and spindles enables users to predict wear and implement preventative maintenance to avoid unscheduled downtimes.

Lastly, HELLER4Performance includes the workpiece-specific optimisation of the machine. It comprises analysis for process and performance optimisation, extraction of real-time data over the internet, and evaluation and graphical display in the cloud.

In practice, it could for example map tool paths and workpiece tolerances in parts of a cycle where tool wear is expected. That section of the sequence would be run on the machine without cutting metal so the paths actually traversed by the tool could be recorded and compared with the workpiece design. The ability of the machine to actually produce the part to the required accuracy could then be ascertained.

The overall aim of these HELLER4Industry measures are reductions in a customers' cycle times and hence in the cost of workpiece manufacture. Even today, Heller is generating added value by promoting greater ease of use of its customers' machines, their optimal integration into a network and expanded functionalities and services.

Additional projects


Other developments announced at EMO included a focus on lightweight materials. The demand for reductions in vehicle weight inevitably requires the use of light metals and carbon fibre-based plastics. In this context, Heller is researching the most appropriate machining processes.

Another project is metal additive manufacturing. The company's engineers are developing a cost-effective process providing high material deposition rates in an industrial environment to add features to a component, followed by subtractive machining. The goal is to find solutions for series production applications in the automotive and general machine building industries.

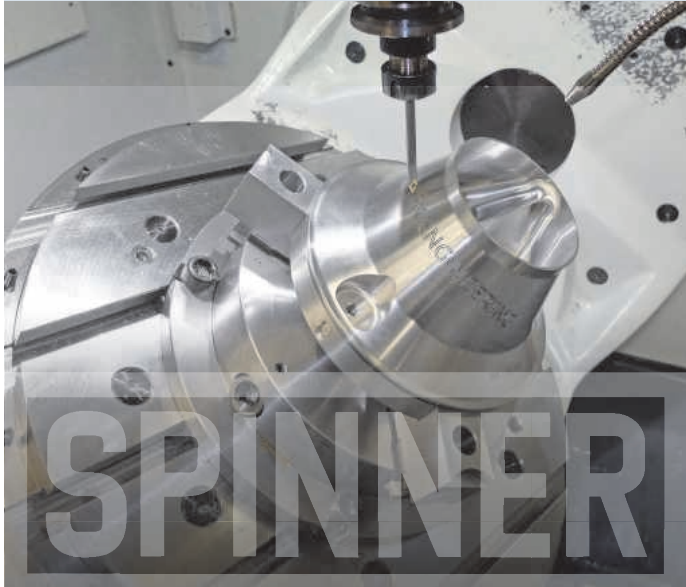
Heller already implements additive technology through its cylinder bore coating (CBC) technology, as visitors to EMO discovered. Intended for use in high-volume production of internal combustion engines, the coating halves frictional forces between cylinder and piston ring. Elimination of cast liners enables a more compact crankcase design and significantly reduced cylinder bore spacing, resulting in a smaller engine and hence weight savings.

All cylinder surfaces of current passenger car and truck engines with bore diameters from 70 mm to 150 mm can be coated using the CBC process. Major vehicle manufacturers have already equipped their production facilities around the world with the technology and are producing high volumes or are planning to do so at more than 20 locations. At the end of 2016, 32 CBC machining systems had been delivered and that number will have doubled by 2018.

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The UMC-750 from Haas provides the answer

Elekta is a leading innovator of equipment and software used to improve, prolong and save the lives of people with cancer and brain disorders. The Swedish company's advanced, effective technology is relied upon by more than 6,000 hospitals worldwide.

Elekta's "Unity" MR-linac combines two technologies, an MRI scanner and a linear accelerator, in a single system. This allows physicians to precisely locate tumours, tailor the shape of X-ray beams and accurately deliver doses of radiation even to moving tumours. As radiation therapy continues to evolve, new techniques and technologies are largely focused on maximising the dose to the tumour site while protecting surrounding tissue as much as possible.

Headquartered in Stockholm, Elekta employs 3,600 people around the world. It has a research and development department in Crawley, West Sussex, and Ryan Wightwick joined this team in the mid 2000's. One of Ryan Wightwick's first actions was to clean up the company's existing manual lathe and mill and put them to use. Persuading management to invest in more modern equipment, new tooling and a second-hand CNC mill were purchased.

Next Ryan Wightwick bought a One CNC CAD/CAM package. At every step, he strove to demonstrate the value of his purchases in machining more complex parts more

accurately and find answers to the issues which arose. The material in the wave-guides found in the linear accelerator is difficult to workhold. The workholding had to be produced quickly and effectively; or it would not be cost effective. Despite sourcing and purchasing modern vices, Ryan Wightwick's search for perfection continued.

Ryan Wightwick decided that 5-axis was the answer. He spent many months researching the right machine and, after seeing the Haas UMC-750 in action at Banbury Haas F1 Team facility, the decision was made. He discussed his findings with the Elekta management team and continued working on the old CNC machine, flagging up any possible 5-axis work. As a result, he was soon given the budget required to make the investment.

Ryan Wightwick says: "Once we decided on the UMC, the procurement process was straightforward thanks to Haas sales manager Don Cole. Siting and commissioning by René Tournier was brilliant. He made sure every axis was centred and aligned."

Once installed, Ryan Wightwick was delighted with his choice as he explains, "The machine is value engineered, but on the right side. I looked at other more expensive machines and realised that marginal gains can make you lose sight of what's really needed. Haas led the market with their design; anything available previously was at least double the price. Others have since copied the Haas knuckle trunnion machine, but just haven't got it right. The Haas keeps the work envelope to a maximum and there's a huge amount of space around the part for such a compact machine. The fully simultaneous 5-axis really allows for a broad spectrum of work."

Ryan Wightwick knew he had made the right choice. The UMC-750, with its 40+1 side mount tool changer and 12,000 rpm spindle, was perfect for the work Elekta do. The machine's through-spindle coolant allows him to really push 20 mm U-drills and he finds Haas' positioning of the left-hand side tool changer further increases the machine envelope, unlike other machines he had viewed.



Ryan Wightwick says: "Using the UMC is a truly enjoyable experience. I got to grips with the control in days as the layout is completely logical and I'm familiar with G-code. I'm especially impressed with the probing routines and the dynamic work



offsets and the fact that there are plenty of spare customisable offsets available. You don't need to be doing complex work to use 5-axis, but when you need to keep repositioning the part, 5-axis allows this in the most accurate way."

Elekta is not a company standing still. It combines additive and subtractive processes, printing 3D organic shapes produced by topology software, using the UMC-750 to machine where an accurate or cosmetic surface finish is required. The next challenge is to adopt hyperMILL, running fully simultaneously for even greater control and will combine this with 5-axis.

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Tebis helps company speed ahead of the competition

MHP Industries Ltd introduced Tebis software to its production last year and so far has witnessed a 20 percent time reduction in their manufacturing processes. The company produced the helmets for Team GB's cycle team for both the London 2012 and Rio 2016 Olympics using the software to help speed up the process and now has plans to expand the use of Tebis throughout the business to achieve similar results.

MHP was founded in 1972 and initially produced patterns for the foundry industry. Over 30 years ago, the company developed a broader customer base and moved into plastics. Based in High Wycombe, it now has capabilities in vacuum forming, toolmaking, 5- and 3-axis routing, CNC machining, assembly and fabrication, packing and distribution. Tebis was chosen after MHP decided that the 5-axis functionality within Tebis was greater than any other software competitors on the market.

The Olympics, MHP and Tebis

The Olympic project began a number of years ago, when MHP was commissioned by UK Sport to produce the helmets for the British racing cycling team. Two types of helmet were developed by British Cycling

and the team at MHP, one for Pursuit and one for Sprint events and the project involved former cyclist Chris Boardman.

According to MHP, the helmets were a real feat of engineering, created in one piece and therefore being as aerodynamic and streamlined as possible. In fact, MHP had to design the tooling to manufacture the helmets as per the designs, such was the challenge they faced. The hard work was rewarded though with 12 medals won by riders wearing MHP helmets in 2012 and the helmets were also used for the Paralympics resulting in a further 22 medals.

In preparation for the 2016 Olympics, the helmets were all cut using Tebis software, allowing for a quicker workflow and turnaround of the helmets, as well as producing a premium trimming finish. Regarding the project, Mark Hipgrave, director at MHP says: "We were proud to have been chosen for a second time to be involved in the production of the helmets for the British racing cycling team. The finish for 2016 was even better with the use of Tebis and its high-speed trimming capabilities. It appears some of the increased speed rubbed off on our Olympic team in Rio!"

Time to invest

The company is looking to the future with an investment programme and recently purchased a new Haas VF9 CNC Machine. With the continued quest for increased productivity, it was also time for MHP to invest in a CAD/CAM software solution that was second to none.

"The software package we were using worked OK, but as the company grew, customer demands became greater and we needed to find something more sophisticated," says Mark Hipgrave. "We decided we wanted the best type of 5-axis software we could find and that's why we chose Tebis".

He continues to explain that with using Tebis software the company is pretty much going through all their previous programmes and re-programming them, which has enabled the business to save time on the trimming. The work it has to do after the trimming process such as finishing has also seen times drastically reduced.



MHP also produce other items using Vacuum Forming programmed by Tebis including hubs for wind turbines and parts for full size motorcycle kits



Members of MHP staff have attended training courses at Tebis's UK's premises in Coventry and regularly hold online viewer sessions with Tebis application engineers to ensure they are up to speed with all the latest developments of the Tebis software. MHP are now working with Tebis on a daily basis and Mark Hipgrave is enthusiastic about the benefits that using Tebis has brought to the business: "Tebis has massively sped up our programming times compared to our old software. It is really easy and simple to use and has a really user-friendly interface."

Speeding ahead

Now MHP is reaping the benefits of introducing Tebis to its trimming processes, it is looking to expand the use of Tebis into its machining operations on the tooling side.

"We currently have five CNC machines with capacity of up to 3 m x 1 m x 1 m and we are hoping to utilise Tebis on the machining side like we do the 5-axis side and cut machining times down" says Mark Hipgrave.

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The 2016 Olympic helmets produced by MHP for the British Racing Cycling Team



Reliable and efficient production with 5-axis flexibility

At the yearly press conference in Kirchheim unter Teck, Makino announced the launch of the latest addition to its family of 5-axis machining centres, the a500Z. Based on proven technologies of Makino's a1 series, the new 5-axis horizontal machining centre is tailor-made for complex-parts production.

The highly rigid machine structure and low inertia of the a500Z ensure the same efficiency of this 5-axis horizontal machining centre one would normally expect from a 4-axis machine. The one-piece bed casting, three-point support and slant-bed design offer stiffness and excellent stability. The symmetrical slant structure, applied in some of the a1 series machines, ensures a minimised force loop for greater efficiency. With Makino's innovative technology, the swivel table comes with minimal overhang and excellent rigidity.

Enhanced productivity

The a500Z has a high-torque 303 Nm HSK-A63 Makino spindle, similar to the a1 series machining centres. Premium job shops are faced with frequent model changes, tight re-programming times as well as numerous positioning and indexing operations as well as on-machine manual inspection times. The a500Z delivers high positioning accuracy thanks to the short distance between the A-axis pivot point and workpiece location. Minimisation of level differences at seams in index machining, and the ability to move heavy workpieces and enjoy fast acceleration and deceleration in simultaneous 5-axis machining further reduces cutting and non-cutting time.

The machining centre offers a 730 mm X-axis, 750 mm Y-axis and 700 mm Z axis stroke accommodating a workpiece of maximum size and weight of $\varnothing 630$ mm x 500 mm and 400 kg respectively. The standard automatic tool changer (ATC) can accommodate up to 60 tools and delivers a chip-to-chip time of 2.4 seconds. The machine's high-speed automatic pallet changer (APC) and horizontal loading function are additional efficiency-boosting features.



Operational accuracy and thermal control

Makino machines are renowned for their thermal control technology and the a500Z is no exception. A thermally symmetrical structure is combined with effective heat removal from the spindle, support structures like the ball screws and motors, to ensure the machine's stability and machining accuracy

during long hours of operation. The ball screws and nuts are core-cooled which prevent heat from building up and creating thermal distortion and subsequent errors. The direct-drive motors on the B/C axis are also fitted with cooling jackets to suppress heat generation.

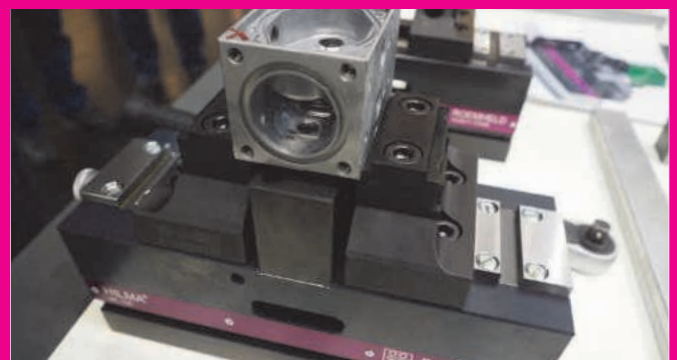
Excellent coolant management and chip evacuation

Effective coolant and chip management is an absolute necessity if a machine is intended for high productivity levels and consequently generates high volumes of chips per minute. Contrary to the conventional 5-axis trunnion table setup, the a500Z has a wide trough located beneath the table. A generous flow of coolant from the overhead shower, wall washing and terrace washing coolant system eliminates accumulation of chips ensures that chips fall directly in to the trough for an excellent chip evacuation. The pallet loading system (PLS) also has terrace washing and a very good flushing system to facilitate better chip evacuation.



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Lathe takes over production of prismatic parts from machining centres

One-hit turn-milling halves cycle time and eliminates inter-machine handling

Looking at the cuboid aluminium components produced for medical diagnostic equipment by subcontractor AES Precision Engineering one would think they were milled, drilled and tapped on a machining centre rather than a lathe. Indeed, they used to be, from sawn billet in two separate operations on a pair of 3-axis vertical-spindle machines in a total cycle time of 12 minutes.

Since April this year, they have been machined complete from round bar in one operation on an Italian-built Biglia B565-YS 6-axis turn-mill centre supplied by UK agent Whitehouse Machine Tools. Program run time has more than halved to 5.5 minutes, accuracy is improved and there is no handling between machines or work-in-progress on the shop floor, significantly reducing the cost of production. Only two turning tools are in the 12-station turret for facing the bar end and for parting off, the remainder being axial and radial driven tools.

Mark Wilson, a director of the family-run subcontracting firm, says: "We have been making these parts for years, during which time the volume has gradually increased to 1,000 per month.

"So we needed to find a more efficient way of machining them. From visits to trade shows we were aware of the powerful prismatic machining capabilities of the latest CNC turning centres.

"We asked four potential suppliers to offer a turnkey package based on production of the aluminium medical part. Whitehouse demonstrated the best process in terms of quality, capability and cost on a



Biglia lathe at its Kenilworth technical centre."

Key attributes of the twin-spindle, single-turret machine that secured the purchase are a full, rather than indexed, C-axis on the counter-spindle, essential for this particular job; and a genuine Y-axis, so there is no need for time-consuming and less accurate interpolation of the X and C axes to achieve the prismatic shape of the component.

Mark Wilson also made the observation that there are no bad machine tools these days, albeit some are more accurate and reliable than others, and that what really makes the difference is the level of service back-up from the supplier. In this respect, Whitehouse Machine Tools is judged to be exemplary based on its handling of the enquiry, applications engineering input to date and feedback from other users of machines it has supplied.

Production engineer Trevor Orman adds: "The quality of the Italian lathe is high for this class of machine, costing under £200,000 with tooling.

"Although tolerances on the medical part are fairly open at 0.1 mm, the Biglia repeats to within microns, which means we no longer have to chase tolerance all day as the temperature varies on the shop floor.

"The machine's accuracy will also be invaluable for production of more tightly tolerated components and its rigidity

means that tool wear is noticeably lower than on our other lathes."

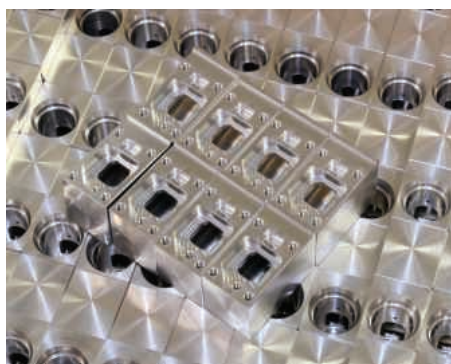
The existence of the turn-mill machine has already brought in a new contract for the manufacture of 316 stainless steel automotive components that AES Precision Engineering could not have quoted for previously.

The subcontractor intends to transfer jobs from other lathes to the Biglia to enable more economical production. It is also looking for further bar auto work to a maximum of 70 mm diameter by up to 560 mm long, preferably involving runs above 1,000-off, to fill the machine's capacity.



Founded in 1987 initially to manufacture components for the medical industry, AES Precision Engineering has since expanded into the automotive, leisure, marine, cosmetics and defence sectors, including the production of complex parts for drones and reverse-engineering of replacement parts for production lines. In 2004, it moved to the present, larger premises on the New Street Farm estate in Ashford, Kent and has invested heavily over the years in a range of new machining centres, including 5-axis models, and multi-axis CNC lathes.

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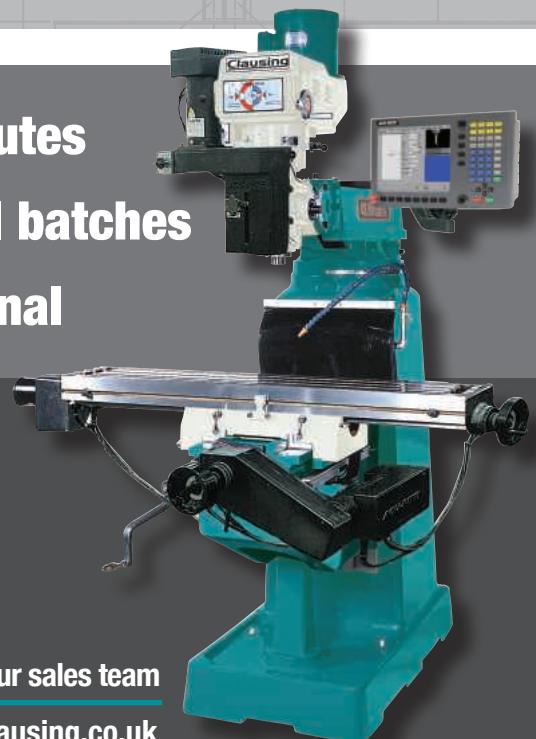


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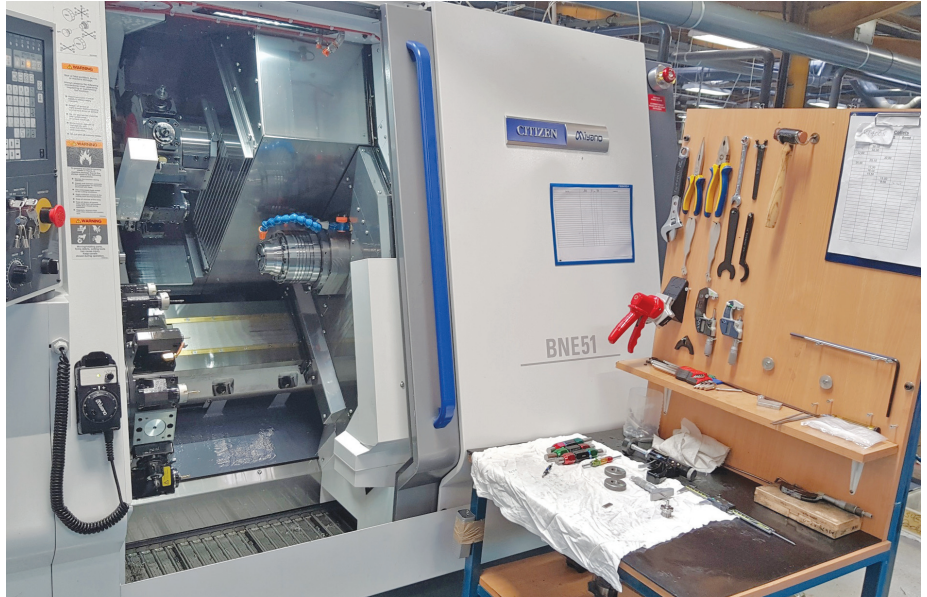


Citizen fits the bill for Roscomac

Some 1.5 million parts are despatched a year from Worthing-based precision subcontract machinist Roscomac, as it achieves record on-time deliveries of 98 percent that vary from completed assemblies and sub-assemblies to large machined castings and small turned parts. The complete operation of the 85-people company is driven by a philosophy of constant development of lean manufacturing techniques, supported by investment often exceeding £1 million a year and an 'open-liaison' people strategy which keeps the workforce up to date on the company and any issues arising.

Managing director Joe Martello says: "We invest in automation and the latest production technology which helps to overcome the shortage of skills we would require. However, it is so important that we still need to grow our own engineers through constant support and by training, in order to maximise our return-on-investment and so improve how we support and what we deliver to customers."

In the first six months of 2017, some £750,000 had already been allocated or spent which included the installation of the latest Miyano BNE-51MSY multi-axis turn-mill centre. Two further CNC sliding head turn-mill centre machines have also been ordered and soon to be delivered, again like the Miyano, each is from Citizen Machinery UK. The two machines, a Citizen L20-VIII LfV, LfV featuring low frequency vibration cutting technology, and a top-of-the-range M16-V will bring the total



Citizen installations to 14 machines as two earlier Citizen machines are being sold.

Cell leader Sean Keet says: "The levels of operational flexibility in the Miyano BNE has enabled us to significantly reduce machining times and most important, improve overall productivity." He explains how the new machine has replaced existing 3-axis machines and outlines how a family of 10 aluminium parts has seen four previous turning and a separate milling operation reduced to just one turn-milling cycle. A massive bonus is that average total cycle times per part has been cut from 13 mins to just 2.5 mins. A further complex stainless steel component which had three operations taking 11 mins is now reduced to a single, four minute cycle.

The flexibility of the BNE-51MSY is key to what cell supervisor Warren Harris, responsible for the machine, is achieving. It was specified with high pressure coolant, Kid 80 bar feed, a hybrid chuck and the latest Citizen UK developed Wizard programming aid. The machine is capable of single cycle cutting with three tools simultaneously overlapped at both ends of a workpiece at the same time created from up to 51 mm bar size.

The fixed-head 15 kW main spindle and two-axis 7.5 kW secondary spindle, both with maximum speeds of 5,000 revs/min, have the advantage of synchronised / superimposed control for both 12-station, all-driven turrets. Ideal for complex and heavier drilling and milling cycles, each driven tool position has 2.2 kW drive

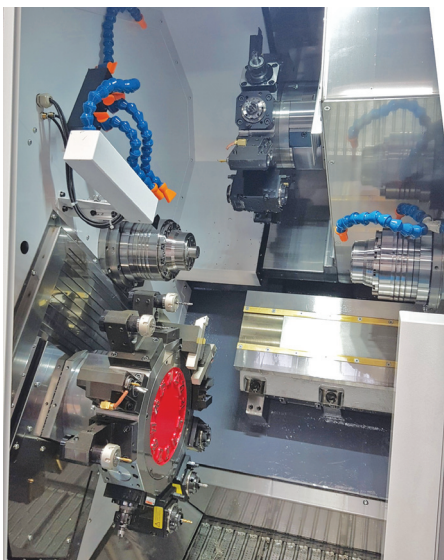
delivering 25 Nm of torque and speeds up to 6,000 revs/min.

The family-owned business of Roscomac was set up in 1976 on an industrial estate of 21 units owned by Joe Martello's father Fernando, who is still involved with the company. However, the company grew so fast that by 1999, subcontract production filled 20 of the 21 units.

The site was then sold and the current 43,000 ft² factory on a two-acre site in Worthing set up and the philosophy of lean manufacturing and continuous investment in automation established. Indeed, with planning permission granted, in 2018 a 3,800 ft² extension will be added and a complete new roof installed over the facility. As part of the drive to maintain quality, AS9100 approved, and improve the working environment, climate control has recently been installed across the factory which is set to maintain a constant 22°C.

Today, some 50 CNC machine tools are installed including 13 Citizen CNC sliding head turn-mill centres and a large 104 pallet flexible manufacturing system. There are also 17 machining centres in the plant involved in supplying medical, 20 percent of £6.5 million turnover, aerospace, 12 percent, vacuum technology, oil and gas, motion and hydraulics and nuclear sectors involving the processing of a wide range of materials from plastics through to alloy steels such as Inconel. Parts are also exported to France, Germany and Czech Republic.

Joe Martello adopts the same working



relationships with machine tool and equipment suppliers as most of his long-term customers maintain with him and his team. This means his key equipment is only bought from a small group of 'partnership' suppliers for which Citizen Machinery UK, formally NC Engineering, has participated since 1990 and in that time installed 16 sliding head and two Miyano fixed head turn-mill centres plus the further two Citizen machines now on order.

Joe Martello says: "As our relationship with customers is built on support, quality and on-time supply, suppliers such as Citizen are in the same category with the added capability to be consistent in

providing us with leading technology developments that will keep us competitive and enable us to properly service our customer base. Our coming installation of the Citizen L20-VIII LFV is a classic case in providing a level of technology that will take us into another sphere of manufacturing that few competitors will be able to match for some time to come."

Current batch sizes range from 30 to thousands of parts plus a prototype and process development / design support service that is available to customers.

Roscomac also maintain stock for key customers which also provides a major benefit to the subcontractor for tailoring batch work to economic quantity levels and helps to achieve its 98 percent on-time delivery target. As a result, this has been improved over the last four years from levels of around 60 percent. Indeed, with productivity targets now running at 200 percent of man/hours available this has been aided by setting up five overlapping shifts during the

five-day week in order to maximise machine utilisation and spindle uptime.

In order to help maintain momentum of production with the workforce, every 3 months the workforce is taken aside to a conference room for presentations made by Joe Martello and key employees for a business update which encourages open communication. These sessions are backed up with live screens around the factory area showing current workloads and status of workflow, target and actual delivery dates achieved.

Citizen Machinery UK Ltd

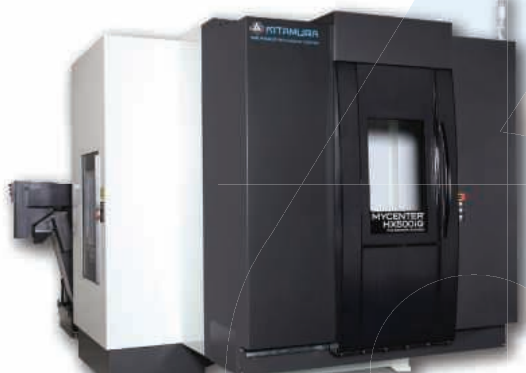
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In-house machining leads to business growth for D&D Engineering

When Gordon Robinson formed D&D Engineering (Hull) over 30 years ago to design, develop and manufacture bespoke conveyor systems for the food processing industry, he had no ambition to machine parts in-house. His reliance on local subcontract manufacturing companies to provide the components needed worked perfectly well in the company's formative years. This was to change when Gordon was joined in the business by his son, and current managing director, Mark Robinson. With Mark Robinson on-board plans were developed to grow the business and, within seven years, D&D Engineering outgrew its original premises so the decision was taken to buy land and create a purpose-built factory.

Mark Robinson says: "It was a risk when we mortgaged to buy our current premises, but with the business growing it was a calculated one, and one which paid off quickly, with the 25-year loan being repaid in 12 years." The growth of the company had come not only from increased sales of conveyor systems, but also from the decision to begin bringing machining in-house for its own production, this then developed into a full subcontracting business. And with Hull's economy expected to benefit from its year as the City of Culture, and new manufacturing

businesses setting up in the area, this growth looks set to continue.

D&D Engineering's first machine tool investment was to bring in some turning capacity in the form of XYZ SLX ProTURN lathes with the ProtoTRAK control. Mark Robinson says: "We found the ProtoTRAK control so easy to use as a first step into CNC machining. Not only that, but the ethos of XYZ Machine tools and the support and enthusiasm from everyone there reassured us that we were making the right decision." With this initial investment satisfying the turning requirement at the time, attention turned to milling and, the positive experience of the ProtoTRAK control meant that choosing XYZ ProtoTRAK controlled SMX bed mills was an easy decision.

Mark Robinson continues: "ProtoTRAK is such a wonderful control for producing contours, pockets, holes and a host of other features on the parts for our conveyor systems, with programming being very straightforward."

With experience of ProtoTRAK turning and milling and business still growing, both for its own products and increasingly supplying customers from the wind power, offshore oil & gas, petrochemical and food industries, D&D looked to develop its machining capability further. This next step saw two XYZ MiniMill 560 vertical machining



centres installed with fourth axis attachments. This new capacity brought in larger batch sizes from customers and the versatility of the Siemens control system, which Mark Robinson describes as 'perfect for our business' made programming at the machine easy. The business generated by having the MiniMills meant that D&D Engineering could invest further, with XYZ 1020 vertical machining centres joining the capacity list, closely followed by turning centre capability in the form of an XYZ Compact Turn 52 and an XYZ 250 TC, with larger diameter turning catered for with the arrival of an XYZ XL 1100 lathe with a 2 metre between centres and 1100 mm swing over the bed.

With these machines in place new opportunities arose for D&D Engineering and it expanded its support of the food and drinks industry, with one customer from that sector providing in the region of £20,000 of subcontract business every month. With that level of work machine reliability was vital for Mark Robinson, here he cannot fault the XYZ machines and the service support that he gets, if needed.

Mark Robinson says: "Many of our machines are running 18 hours a day so we ensure that they are regularly serviced, with the highest dependency machines being on XYZ service contracts, which provide excellent value. On top of that, the service





engineers always seem willing to spend time and discuss things with us, which reflects the high level of support we get from anyone we talk to at XYZ."

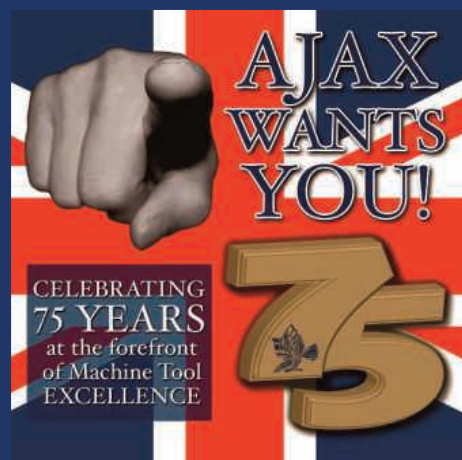


While both the ProtoTRAK and Siemens control make programming at the control a relatively simple procedure thanks to their conversational languages, D&D Engineering has also invested in offline programming through XYZ Machine Tools and, once again, this is opening up new opportunities, especially in the injection moulding sector. With this mould tool work came a further need for investment, this time in larger capacity vertical machining centre capability. This was addressed with the arrival of an XYZ 2010 HD VMC. Part of XYZ's heavy-duty range of machines the 2010 has 2000 mm of X-axis travel, 1000 mm and 800 mm in Y and Z. Developed for large components, such as mould tools, the machine features hardened box slideways, with six slides alone on the Y-axis. At D&D Engineering they utilise the 30 position toolchanger to maximise run-time, with the machine running unmanned overnight on long cycle time work, then switching to shorter runs during the day.

Mark Robinson concludes: "The XYZ machines and XYZ itself has served us very well and I can't recommend them highly enough. One knock on effect of our investment in XYZ machines has been the requirement to develop our skills set. This led to us starting an apprentice scheme several years ago and we currently have five apprentices out of a workforce of 28, this is something that we are very proud of. More positive is that many of those that we have trained have stayed with us and gone on to operate and program the XYZ machines."

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It's a wrap

New Doosan DNM 6700 ticks all the right boxes for packaging specialist

Thermoform Ltd, the Ashbourne-based design and manufacturer of bespoke vacuum and pressure formed plastic packaging solutions, has recently invested in a new large-capacity Doosan 3-axis Fanuc-controlled vertical machining centre supplied by Mills CNC.

The machine, a DNM 6700, was installed in the company's in-house toolroom facility in July 2017 and, just a couple of days following its delivery, was being put through its paces machining complex, high-precision prototype and production-ready aluminium mould tool parts.

These mould tools, when completed, are used by Thermoform to manufacture at its adjacent 24/7 production facility bespoke, high-volume 'thin gauge' plastic trays, clamshells, blisters and hinged containers for a diverse and growing range of customers operating in the confectionary and bakery, meat, fruit and vegetable, pharmaceutical, toiletries, electronics and DIY sectors.

Thermoform manufactures some 70 million plastic parts annually and demand for its products, fuelled by organic growth and new contract 'wins', has grown exponentially in recent years.

This upsurge in demand was putting pressure on the company's toolroom: in particular its in-house CNC machining capacity and capabilities.

Following a review of its machining resources, undertaken at the start of the year and conducted as part of a company wide continuous improvement programme, it was determined that additional CNC machining capability was required sooner rather than later.

Matthew Perks, Thermoform's managing director, explains: "From April to December we experience significant demand for our products, driven in the main by our confectionary customers as they gear up for Christmas, Valentine's Day and Easter.

"The seasonal nature of our business, combined with significant year-on-year growth in sales per se, means that we need new mould tools to be designed, developed, tested and approved in double-quick time to meet our own in-house production schedules and our customer delivery requirements.



"One of our company's Unique Selling Points (USPs) is achieving fast turnaround times and we realised that if we did not invest in additional CNC machining capability in our toolroom - this could be compromised."

In Spring 2017 the company began an extensive search into the market investigating not just different machine tools and their availability, but also the strengths and capabilities of individual machine tool suppliers.

New machine tool search criteria

The new machine tool required by Thermoform needed to tick a number of boxes. These included: capacity; power and cutting capability; availability; service and support.

Doosan DNM 6700 capacity

Matthew Perks explains: "We are no strangers to CNC machine tools or CNC machining and, since 2001, have invested in three high-speed vertical machining centres."

"However, although these machines continue to perform well and deliver excellent component accuracies when machining 'smaller' mould tool parts, they were found wanting when machining larger mould tool components i.e. aluminium base plates."

Prior to investing in the DNM 6700, these aluminium plates had to be machined in a number of setups on the company's existing machines.

Because the size of the parts exceeded the machines' table and travel capacities, the machines were having to be stopped to enable parts to be moved and to allow the required re-fixturing/re-clamping operations to be performed.

This clearly had a negative impact on productivity and cycle times and created machining bottlenecks in the toolroom.

Having to reposition parts also affected part quality and accuracy and often resulted in the creation of unwanted tooling 'step' marks when machining continuous mould tool features, such as strategically positioned cooling and heating channels etc, that ran across the width and height of the plates.

The DNM 6700 machine is a large-capacity machine quipped with a generous-sized work table, 1,500 mm x 670 mm, and impressive axis travels of X-axis: 1,300 mm x Y-axis: 670 mm x Z-axis: 625 mm.

Matthew Perks says: "The investment in the DNM 6700 enables us to machine large, as well as multiple smaller, parts in one setup. Consequently, cycle times have improved and bottlenecks have been eased."

Doosan DNM 6700 cutting capability

Powerful, high-torque spindle capability was also a key consideration for Thermoform in its machine tool search, as was the machine's ability to perform high-accuracy and repeatable rigid tapping operations.

Matthew Perks says: "High precision machining capability was a particular requirement. We machine mould tool components from solid aluminium and, from a productivity perspective, a machine that could achieve and deliver accurate high-volumetric removal rates was a 'must' for us."

The DNM 6700 is equipped with powerful high-torque 118 N-m direct-drive spindle technology 18.7kW/12,000 rpm. This technology makes the machine ideal for high accuracy roughing and finishing operations, and for fast and reliable rigid tapping.



Doosan DNM 6700 availability

To meet the demand from its production facility for high-quality mould tools Thermoform needed the required machine to be installed in its toolroom as quickly as possible.

The Doosan DNM 6700, one of Mills CNC's staple vertical machining centres, was available immediately from stock from Mills' Technology Campus facility in Leamington, and was delivered, installed and commissioned in double-quick time.

Matthew Perks says: "Installation was smooth and trouble-free. After only a couple of days we were up and running and cutting metal."

Doosan DNM 6700 service and support

A key selling point of Doosan machine tools in the UK and Ireland is

the pre- and after-sales service and support provided by Mills CNC. Matthew Perks says: "We were impressed by Mills' approach and our experience in dealing with Mills, and its machine tool sale, delivery and installation, and training, has been positive."

Although still early days Thermoform's investment in a new Doosan DNM 6700 vertical machining centre is already paying dividends.

A recent example of the power and performance of the DNM 6700 has seen a massive reduction in cycle time when machining a specific mould tool component, down from eight hours to just 48 minutes.

Mills CNC Ltd Tel: 01926 736736

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Feeler's FTC heavy-duty turning centres lighten the load

Now available in the UK and Ireland from official importer, sales distributor and sales agent, TDT Technology, is the Feeler range of FTC turning centres and slant bed CNC turning centres. Aimed at machine shops tasked with heavy-duty machining operations, these advanced machines offer an extremely competitive cost-to-performance ratio.

The Feeler FTC range comprises three models, the FTC-10, FTC-20 and FTC-30. Between them, the machines cover a swing-over-bed of 520 to 600 mm diameter, a standard turning diameter of 180 to 310 mm, a maximum turning diameter of 240 to 450 mm, and a maximum turning length of 255 to 621 mm, making them ideal for most heavy-duty turning applications across industry.

All three FTC turning centres feature a spindle equipped with high-precision, dual-direction, angular-contact thrust ball bearings to meet the needs of demanding cutting operations. A special heat-dissipation headstock design eliminates elevated temperatures from the



spindle bearings, thus prolonging life and promoting reliability.

Featuring a host of optional automation options, such as tool setting and part measuring, as well as automated loading and unloading of parts, the Feeler FTC series is designed for unmanned operations around the clock. Maximising productivity and profits are the ultimate aims.

Machines in the Feeler FTC series of slant bed CNC turning centres are designed for rigidity, efficiency and versatility. Kicking off the range is the FTC-300, which features a 6000 rpm spindle, 6" chuck and 52 mm diameter bar capacity. Moving up, the FTC-350, 350L, 350XL, 350LY (Y axis) and 350SLY (twin spindle) offer a 4500 rpm

spindle, 8" chuck and 52 mm diameter bar capacity (66 mm option). All feature a 30° slant bed that provides operational safety, accuracy and easy chip control.

For an even more robust structure, the FTC-450 and 450MC, C axis and driven tools, provide a 45° slant bed, a maximum turning diameter of 450 mm and a maximum turning length of 650 mm.

For the ultimate power and rigidity, the FTC-640 and 640L again feature a 45° slant bed, which is matched with a 15" hydraulic chuck, 117.5 mm bar capacity, 22/26kW spindle motor and A2-11 heavy-duty spindle.

Among the principal features of these machines are the use of oversized linear motion guideways on the X and Z axes. Linear guideways provide a reduced co-efficient of friction along with increased speeds and feeds.

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Why fluid lubrication is critical for padded reaming

by Scott Pardel, metalworking lead product manager

Padded reamers are utilised throughout the manufacturing industry to generate the final hole geometry and meet demanding surface finish tolerances. Some examples of padded reamer applications are automatic transmission valve channels, engine valve guides and engine crankbore/ cambores. Since the reaming process is one of the last manufacturing steps prior to assembly, it is extremely important to optimise the process to reduce costly scrap.

As the name implies, the padded reamer differs from a fluted reamer in that the padded reamer has a cutting surface and guide pads that ride on the diameter of the hole to put pressure on the cutting surface which generates the hole size and geometry. The guide pads also act as a burnishing tool to help provide a smooth surface finish. Since the pad forces are "riding" on the inside surface of the hole, significant lubrication is necessary in padded reamer operations to eliminate scratches on the hole surface and maintain the required surface finish.

Lubrication is especially critical for the first guide pad after the cutting surface. Therefore, metalworking fluids play a very critical role in the optimisation of padded reamer applications for a number of reasons.

Metal adhesion to the reamer pads is one of the primary routes to failure and loss of surface finish. Inadequate lubrication of the padded reamer may result in scratches in the bore from aluminum pick-up on the guide pads leading to surface finish issues. The primary purpose of the metalworking fluid is to supply a sufficiently thick film to maintain low friction between the workpiece and the guide pad surfaces. This film prevents metal adhesion and subsequent surface finish degradation.

Fines from the cutting operation have been shown to be a significant mechanism of failure in the padded reaming operation.

Chips and fines need to be efficiently carried to the filtration system for removal from the machining process. Significant fines build-up will be carried into the guide pad/metal interface and negatively impact the surface finish.

Optimal metalworking fluids for padded reamers need to provide lubrication of the

■ Cutting Insert

■ **Guide Pads:** For stabilization of the tool, and for achieving polished finish of workpiece surface



- » Usually occurs on lead of guide pads
- » Occurs first on guide pad immediately after cutting insert
- » Metal transfer on tooling occurs on guide pads, not on cutting edge

guide pads but also carry the fines from the point of cut. These properties are inversely related in the fact that more lubrication means an "oilier" emulsion and this typically carries more fines. A "tighter" emulsion typically carries fines more effectively but lacks the lubrication necessary at the pad/metal interface.

Inadequate cooling at the point of cut can result in non-conforming hole geometry and premature reamer wear.

Many reamer applications utilise through-the-tool coolant systems that require a metalworking fluid to operate at higher pressures without foaming. Excessive foaming will adversely affect the coolant pumps and reduce the coolant delivery to the point of cut.

Although proper setup up of the padded reamer is one of the most critical steps in the success of the reaming process, the proper selection of a metalworking fluid is crucial. Padded reaming requires a metalworking fluid that offers the necessary lubrication properties to give sufficient film thickness and emulsion properties that will efficiently

carry fines, help minimise defects, maximise throughput, and increase tool life. Quaker's high-performance semi-synthetic fluid technology designed for critical reaming applications, QUAKERCOOL® 7450, provides excellent tapping performance in heavyduty machining operations such as on automotive and aerospace aluminum alloys. This fluid delivers significant improvements in reaming applications at product concentrations lower than typical soluble oil technology. QUAKERCOOL 7450 offers the following benefits to your operation:

Unique formulation provides the necessary lubrication at the pad/metal interface for critical surface finish requirements while also maintaining extremely efficient fines handling for enhanced padded reamer performance. It contains excellent foam and emulsion stability properties for high pressure through-the-tool coolant reamer applications and insures proper metalworking fluid delivery to the point of cut. It can be run at water hardness ranges from 0 ppm to 500 ppm and is very stable

with increasing magnesium hardness from machining aluminum castings. Enhanced biostability package resists bacteria and fungus, extends sump life, and has minimal plant odours, whilst Formaldehyde and boron free technology improves residue and meets HSE compliance.

Since 1918, Quaker has been establishing and maintaining long-term relationships with leading customers in primary metals, metalworking, and other basic process industries all over the world. Today, it has a global presence in 21 countries and 40 locations, with over 50 percent of 2015 net sales outside the U.S. It is also well positioned for growth in key emerging markets such as China, India and Brazil.

Quaker's corporate headquarters is located in Conshohocken, Pennsylvania, with regional headquarters in Uithoorn, The Netherlands, Rio de Janeiro, Brazil and Shanghai, China. The company is publicly traded on the New York Stock Exchange, under the ticker symbol KWR, and has a long track record of financial consistency and strength.

While working hard to meet customers' needs, it also feels a strong sense of responsibility to its associates, to the



communities in which it operates and to the natural environment.

Its efforts in quality have been acknowledged by the International Organisation for Standardisation, with ISO 9001 ratings at its own facilities, as well as at customer sites where it delivers services and products directly. Many of its facilities are also ISO 14001 certified and rated by accredited companies such as Lloyd's,

British Standards Institute (BSI), and Det Norske Veritas (DNV).

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Award winning lubrication supplier

German lubricant manufacturer Zeller + Gmelin has once again won the Bosch Global Supplier Award under the category "Indirect Purchasing."

Zeller + Gmelin develops individual and holistic solutions from one source, starting with research and development, and production. At its Eislingen site, 20 percent of its more than 500 strong workforces are employed in development and laboratories. The independent, medium-sized chemical company employs around 900 people worldwide and has more than 800 high-performance lubricants available.

Siegfried Müller, marketing and sales at Zeller + Gmelin, says: "We are extremely proud to be the only lubricant manufacturer named among the prize-winners. Receiving the new award underlines once again that our concept of being an innovative partner and solutions supplier to our customers is a complete success."

Hans-Joachim Schenk, key account manager for Zeller+Gmelin, says: "Many German and international Bosch plants have now switched over to this innovative cooling lubricant. Our strength is to develop individual solutions for the worldwide use at our customers."

Bosch has awarded a total of 58 suppliers from eleven countries. With this award, the company recognises outstanding performance in the production and delivery of products or services, particularly in the areas of quality, costs, logistics and innovation. With this award, Bosch hopes to honour its business partners. Bosch business partners are considered as development and innovation partners.



Higher efficiency in machining of modern materials

Zeller+Gmelin presented powerful cooling lubricants for difficult machining processes at last month's international metalworking exhibition EMO 2017 in Hanover. Highlights at its booth included, among others, innovations of its product line Multicut. The non-water-miscible cooling lubricants are suitable for the most severe machining tasks and a multitude of processing materials. Further focus is on Zubora, the company's water-miscible cooling lubricant line: Zeller+Gmelin's cooling lubricants impress by economy, performance and individuality. Thanks to these strong points, the Eislingen based company has already been distinguished for with several Bosch Supplier Awards.

The Eislingen expert for lubricants, printing inks and chemicals has, since its establishment in 1866, consistently

developed itself into one of the most reliable solution partners of the metalworking industry. At EMO 2017 the company presented a wide range of innovative water-miscible and non-water-miscible cooling lubricants for different processes and areas of application.

Thorsten Wechmann, product manager at Zeller+Gmelin, says: "We want to provide our customers with an efficient value chain by being a reliable system supplier, innovator and solution provider at the same time."

Customer-oriented solution partner with own research

Zeller+Gmelin has long been a close partner for solutions that develops products according to the specific requirements of its client companies.

Thorsten Wechmann says: "We always strive to set new standards to achieve best results for our customers, which is why around 20 percent of our employees in Eislingen work in research and development. We also offer consultancy on lubrication and machining technology, laboratory analyses of the performance of our products in customer applications as well as help with disposal issues."

Zeller+Gmelin GmbH & Co. KG was founded in 1866 and is a medium-sized, globally active company with 16 subsidiaries worldwide. The high-quality products of the lubricants, industrial chemistry and printing inks divisions internationally take a leading position on the market and are distinguished by many years of experience in research and development.





be research and development or production and sales, all the processes in the lean organisation are perfectly interlinked. Your individual requirements are fulfilled in a creative and flexible manner. New discoveries and ideas are rapidly implemented and the industrial lubricants are always aligned with the latest economic and ecological standards.

Leading automotive groups, steel plants as well as small and medium-sized businesses have placed their trust in industrial lubricants from Zeller+Gmelin for decades.

Zeller + Gmelin UK Ltd

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Collaboration with research institutes and universities creates the strength to develop solutions which satisfy customers' demands. The company attaches importance to individual and holistic solutions and offers research, development and production, all from a single source.

In close cooperation with customers, Zeller + Gmelin is developing answers to questions which we will only face tomorrow and which are based on the highest standards.

The company considers innovation a core competence. At its headquarters in Eislingen alone, around 20 percent of the employees work in research and development. Zeller + Gmelin is constantly striving to further develop and permanently optimise its products and to place new innovations on the market. It is a basic principle of the company to bring in line economic, environmental and health aspects with the development and manufacturing of new products. The company strives to ensure a consistent high quality.

Zeller+Gmelin is certified according to DIN EN ISO 9001:2008 as well as DIN EN ISO 14001:2005, environmental certificate.

Zeller+Gmelin was awarded the quality seal "TOP 100" several times with which the innovation success in the market was rated by means of the four areas of innovation management: innovative processes and organisation, climate for innovation, innovation marketing as well as a top management promoting innovation.

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TRIM metalworking fluid saves costs and assures quality

For the German CNC expert, K&P Frästechnik, investment in new machinery to meet increased demand for its prototyping and short run metal machining was not the early success the company envisaged. The metalworking fluid it had used for years soon proved unable to maintain production quality at the higher speeds and coolant pressures. Not only did this result in a big downturn in efficiency but also a lot of expense. The race was on to find an alternative but ultimately TRIM® MicroSol 519 from Master Fluid Solutions provided the answer.

Whether in special-purpose machinery manufacturing or at the Deutsche Tourenwagen Masters, high-quality parts made from titanium, vanadium steel, tungsten, aluminium or plastic produced by the experts at K&P Frästechnik are used to meet the greatest loads.

Having commissioned the new CNC machining centres to produce quality parts quicker, coolant problems became evident immediately. The higher speeds and overall pressure, as well as internal film cooling, caused the emulsion to split into oil and water. The old coolant was pumped out and the machines filled with an alternative but within a matter of weeks, that too started to fail.

A huge quantity of scum was produced that attacked aluminium, causing black marks to appear on the material. And the machine itself became heavily contaminated with oil. After further cleaning and refilling, additional biocides were added with the aim of preventing fungal attack. But all efforts proved futile and the problems remained.

Escalating costs

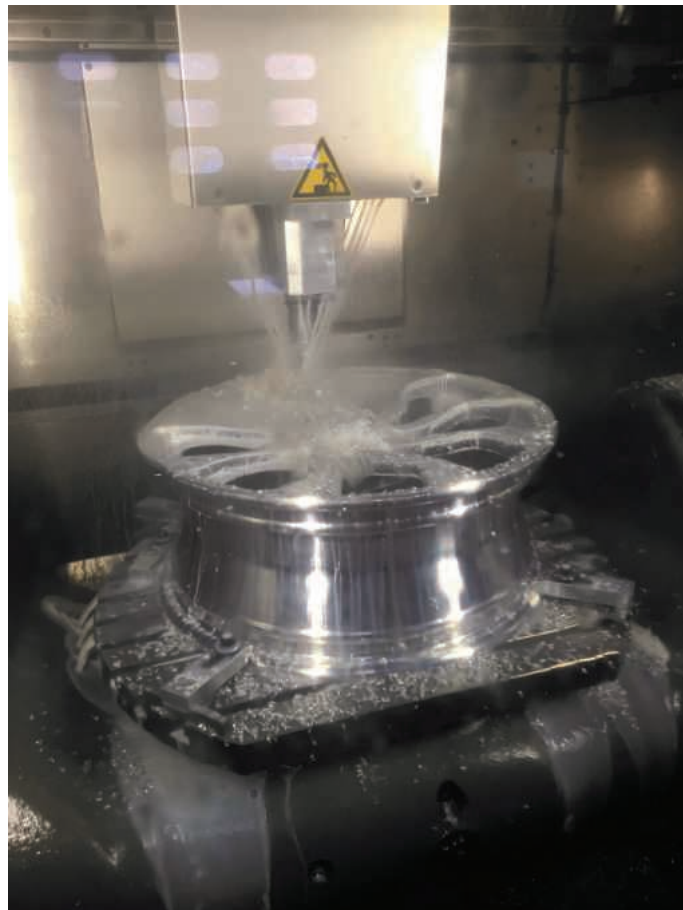
Not only was product quality being severely compromised, the coolant failure was costing the company dearly. Coolant was exchanged no less than five times incurring machine downtime costing around 7,500 Euros (£6,500), coolant disposal at 3,500 Euros (£3,000) and refilling at 5,000 Euros (£4,500). In addition, there were costs for the biocide and associated non-productive time. In total, the cost penalty of unsuitable coolants came to nearly 16,000 Euros (£14,000).

Looking back, co-owner Michael Paulick explains: "We were under unbelievable pressure regarding costs and quality. If we had known about Master Fluid Solutions earlier on, we would have saved a great deal of money and many sleepless nights."

In a last-ditch attempt to solve the problem, K&P Frästechnik contacted the metalworking supplies company Graushaar, based in Frankfurt, and this move proved an important turning point. Master Fluid Solutions TRIM MicroSol 519 was recommended and trialed. Unlike all the others, this coolant remained biostable without the need for any additives, kept the machines clean and, most importantly, assured the quality of the end product.

"Our machines have been running absolutely perfectly for two years now using the Master Fluid Solutions metalworking fluid," adds co-owner Ralf Kusch. "Through long maintenance intervals alone, we are saving several thousand Euros per year."

The TRIM range from Master Fluid Solutions, developed in the company's laboratories in Needham Market, are ideal for the German market largely because of their performance and health



and safety attributes. TRIM MicroSol 519 is a classic example of the company's latest generation products, a general-purpose metalworking fluid that is both boron- and formaldehyde-free. It provides medium to high levels of lubrication without the need for chlorinated or sulphurised extreme pressure additives.

For K&P Frästechnik, TRIM MicroSol 519 is not only cost-effective because of its long sump life and stable performance. Very little of the product is lost on workpieces and swarf and when topping up the fluid, just one percent is sufficient, where previously between two and four percent was required.

In total, K&P Frästechnik, require just one barrel of TRIM MicroSol 519 per year. When compared to the consumption of previous metalworking fluids, this represents a saving of two barrels over the same period.

Michael Paulick concludes: "The Master Fluid Solutions product provides the perfect combination for entrepreneurs – costs that are significantly lower with product quality that is consistently high."

Master Fluid Solutions

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Getting ready for Industry 4.0 using new software

The EfficiencyManager from Klüber Lubrication for transparent process planning

In the age of Industry 4.0 manufacturing companies have to deal with increasingly complex machinery and maintenance procedures. Tighter schedules and optimised maintenance intervals are to be met as well as legal regulations and documentation requirements. All this calls for more efficient processes and optimised planning.

Klüber Lubrication now offers a software which enables manufacturing companies to efficiently align increasingly complex structures in the networked plant: the EfficiencyManager. It provides companies with an overview of all the machines, appliances and equipment relevant for the production process.

Fritz Bischof, manager digital transformation at Klüber Lubrication, says: "The EfficiencyManager offers many options to increase efficiency in production. It provides companies with a transparent overview of their potential for optimisation.

Potentials for increasing efficiency can be ideally multiplied, e.g. in the form of energy efficiency projects, the optimisation of spare parts life or the reduction of defects and hence maintenance activities."

Companies can use the EfficiencyManager online and enter all the information required for a trouble-free production. This includes for example data on relubrication and maintenance, deadlines for calibrating scales or inspecting fire extinguishers.

Fritz Bischof continues: "Thanks to accurate documentation of all details perceived by the customers as significant, our EfficiencyManager has become an important, indeed vital source of information. It also provides valuable support for preparing and conducting audits, for example.

Via the cloud-based EfficiencyManager multilocation companies can exchange Best Practices and ensure transparency across all locations. A dedicated authorisation system



makes sure that each user can only see the relevant section and perform the activities for which he/she has been authorised. The data concerned are stored securely on a server in Germany. User guidance is browser-based.

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Hangsterfer's environmentally-friendly lubricants

Manufacturer Hangsterfer is dedicated to providing high performance machine lubricants without compromise to health, safety or environmental concerns. As a family-owned 4th generation company, the company only make products that it is comfortable for its friends and family to use. The factory is situated on an active farm where it raises cattle and grow vegetables for the local community since its incorporation in 1937. Because of this, compassion for nature and the environment is part of Hangsterfer's corporate culture. The company's founder, Dr. Hangsterfer, even developed a whale oil substitute back in the 1950s. To this day, the sole research, development and manufacture of non-toxic environmentally-friendly lubricants proves that industry and environment can successfully coexist.

The term "environmentally friendly" is often loosely defined and easily misunderstood in most industries, including manufacturing. When Edward Jones, COO of Hangsterfer's, was asked about what factors make a lubricant "environmentally friendly," he suggested that ingredients must be judged on the basis of whether or not they are "Persistent, Bioaccumulative, and Toxic (PBT). It is essential to eliminate suspected or known bioaccumulative ingredients like medium and short chain chlorinated paraffins from the manufacturing process. Hangsterfer's does not use any PBT additives or bioaccumulative ingredients. For chlorinated products, Hangsterfer's only uses the safest long chain and very long chain chlorinated paraffins.

Eliminating hazardous materials from metalworking processes is not only beneficial for people and the environment, it is also increasingly required by law. The primary chemical regulations for the European Union fall under the classification, Labelling, and Packaging regulation known as CLP. It came into effect in 2009 for all EU member states, as well as the UK. Of course, the Registration, Evaluation, and Restriction of Hazardous chemicals regulation better known as REACH has been in force since 2007. Although it originated as a European regulation, many countries outside of the EU have begun to adopt REACH.

Although it does not regulate chemicals in and of itself, the Globally Harmonised

System, or GHS has standardised the labelling of chemicals. GHS began as early as 1992 and has yet to be fully implemented in all countries.

However, as of 2017 many countries have legislation that essentially enforces the adoption of GHS and companies that do not adopt it may be subject to fine and other penalties. The standardised product safety data sheets of GHS include universally understood pictograms to denote hazardous chemicals. Unlike most lubricant companies, Hangsterfer's promotes labels and safety data sheets that do not contain any hazardous pictograms.

Unfortunately, many fluids on the market still contain ingredients like boron, formaldehyde, and secondary amines. Formaldehyde was officially classified as a carcinogen under the CLP regulation in 2016, yet it is estimated that more than 30 percent of fluids contain formaldehyde condensates.

Hazardous chemicals including formaldehyde condensates are commonly used as biocides. They are either incorporated into the formulation of the product itself or sold as additives for the machine tank. Instead of relying on harmful biocides, Hangsterfer's has developed the latest "bio hard" technology. Bio hard means that the product is designed to be



The Hangsterfer's estate

harder for bacteria to digest by using branched (as opposed to linear) molecules. However, the product can still be easily waste treated. Bio hard products equate to less maintenance, less machine downtime and greater savings.

Adopting environmentally safe technologies does not mean compromising on performance. On the contrary, Hangsterfer's has developed metalworking lubricants that improve tool life and increase efficiencies without using hazardous ingredients. For example, vegetable oils have been engineered in a way that actually makes them perform better than petroleum oil, yet they are still biodegradable.

In addition to being safer for machine operators and the environment, non-hazardous lubricants tend to have less pungent odours and they are easier on the skin. They also leave machine walls much cleaner than traditional lubricants, improving overall factory appearance.

The regulation and restriction of hazardous chemicals is essential for human health and the environment. When engineered properly, these lubricants can also outperform traditional formulations. Switch to Hangsterfer's environmentally friendly lubricants today and enjoy a cleaner, safer work environment.



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Freddy launches new 'Micro' coolant recovery system

Recognised as the most widely used and well-established coolant vacuum range in the world, Freddy Products has now added to its product line-up with the arrival of the new Freddy Micro.

As the name suggests, the new Micro is a compact coolant recycling system that has a 50-litre tank capacity with a 37-litre perforated basket. Designed and manufactured in the UK; the new Micro is manufactured to the remarkably high standards and specifications that has made Freddy a trusted name for decades.

Extremely versatile and mobile, the new Micro has compact dimensions of just 670 mm by 430 mm by 980 mm (LxWxH). The small footprint is a powerful single phase 2 kW motor that offers the option of 240V or 110V power source. The motor generates an airflow rate of 3,000 m³/hr with a water in-flow rate of 238 litres per minute and an out-flow rate of 100 litres per minute. The fluid is filtered through a filterbag, which are available from 1,000 µm down to 5µm to ensure the Freddy Micro captures all contaminants from your machine tool.



The powerful and efficient motor, the compact lightweight design, and the robust build quality makes the new Freddy Micro the only choice for small businesses and machine shops that only have an occasional demand for coolant filtration. Additionally, as the smallest vacuum system in the Freddy range, the Micro is the most cost-effective unit available as an entry point for

customers. The Micro is well suited to companies currently not utilising a fluid recycling system that may be looking to reduce coolant consumption, prolong fluid life, reduce the health risks associated with poor fluid management and even improve machining performance by eradicating the use of rancid coolant.

The new Freddy Micro is finished with a hard-wearing powder coated paint. This durable paint combines with a robust design and high-quality components manufactured in the UK to make sure your new Freddy will last for a generation and beyond. Complete with a 38 mm hose and gulper tool as standard, with the option to upgrade to a 51 mm hose if required as well as a 24 month warranty, the new Micro is a cost effective entry point for coolant recovery.

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Nanol's additive proven to reduce hydrogen wear of metals

Originally designed for fuel saving, Nanol's additive now enters completely new areas of use.

The renowned Fraunhofer independent research institute in Germany has demonstrated that Nanol's lubricant additive has some completely new performance features. The patented lubrication additive, based on nano technology, was originally developed for fuel saving and wear protection in marine engines and industrial applications.

The latest testing now shows that the additive has additional positive properties as well, as it can prevent so-called hydrogen embrittlement. Hydrogen embrittlement is the process by which metals such as steel become brittle and fracture when in contact with hydrogen.

The testing that demonstrated the new effect of Nanol's additive was conducted by a leading manufacturer of ball bearings. Further testing was also carried out at Fraunhofer Institute by Professor Dr Matthias Scherge.

Professor Dr Matthias Scherge, who has



previously conducted several other laboratory tests on Nanol's additive, says: "The latest research has added new features to the scientific picture of Nanol. Nanol must be considered a package with multi-functional properties including viscosity index improvement, friction modification, anti-wear properties as well as protection against hydrogen embrittlement."

Hydrogen embrittlement is a serious issue in several applications, and the newly demonstrated property opens completely new areas of use for Nanol's additive. So far, the additive has mainly been used by

shipping companies in marine engines and power plants.

Johan von Knorring, Founder and CEO of Nanol Technologies, says: "We are now starting to penetrate new customer segments. Hydrogen embrittlement is a severe problem in for example wind power turbines. By using Nanol, the lifetime of components can be extended and service intervals prolonged."

Several other technologies are available to deal with the hydrogen embrittlement problem, including for example various coatings. According to von Knorring, Nanol's solution is both more reliable and effective in comparison.

Lubrication pioneer Nanol Technologies Ltd was founded in 2010 and is headquartered in Helsinki, Finland.

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Kraft & Bauer UK expands to meet fire safety needs on machine tools

Coventry-based, 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 the storage facilities in Coventry and in Cork.

Thomas Nicholls, manager at Kraft & Bauer UK, advises that having invested in further service personnel to support its growing number of UK and Irish customers. An extra-long bed van was selected and then had it racked out to create a mobile workshop in order to better be able to carry out installation tasks in the field. This allows not only the carrying of much more stock but also to more easily adapt our fire extinguishing systems on-site to create truly bespoke systems to suit any specific machine tool.

As more and more new machines are fitted with Kraft & Bauer's systems then naturally the global annual servicing of those systems increases. However, 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, says:

"Every year here in the UK we see around 50 incidents whereby our systems are activated to protect machines and operators from serious injury and more and more companies are now understanding that many machine tools are classified as a fire risk and that there are large penalties, including unlimited fines and even prison, if those responsible have failed to take adequate action to prevent harm coming to employees. Machines that are understood to pose a direct fire risk include any machine that uses oil, or any kind of potentially flammable liquid, such as an oil based coolant.

"Examples include turning machines, milling machines, machining centres and grinding machines. Any machine that produces a spark or similar such as an EDM machine or a laser machine must also be considered as must any machine that although being used "dry" (without coolant) is machining a self-combustible material such as titanium or magnesium alloys. Most fire incidents are caused by the generation of incandescent chips, high-energy sparks or hot surfaces, which act as ignition sources. Root causes included broken or worn milling cutters, drills, turning inserts and grinding wheels. Technical developments concerning machine tool feeds and speeds, together

with the trend towards low-viscosity metalworking fluids used at higher pressures, have dramatically increased in recent years and the industry must take that risk into account."

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 and 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. It should also be understood that even if end users are eventually successful in making a claim that 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 and will most likely simply go elsewhere and therefore important contracts can be lost, in some cases forever.

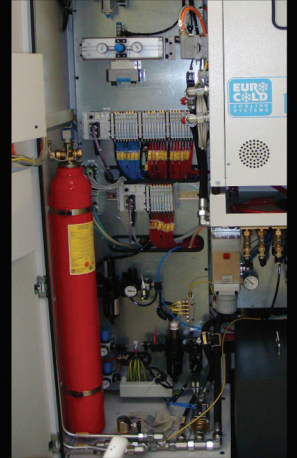
Machine tools commonly employed in the aerospace and medical industries that machine titanium or magnesium materials are protected by argon gas based systems whilst the majority of systems use Co2, which is adequate for extinguishing most fires. In both cases the systems, which do not damage machines, ensure that production can be up and running again within minutes of an activation. For those customers that do not keep spare cylinders on-site, Kraft & Bauer offers a same-day bottle exchange or a next day re-fill service for the most common sizes of cylinders.

For more information, contact:

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Machining monitoring adds extra value to manufacturing

by Adir Zonta, product manager Process Monitoring and Machining Analytics, Sandvik Coromant

To paraphrase Harvard University's Gary King, while data is plentiful and easy to collect, the real value is in what you do with it.

Collecting data and using it to make improvements has been recognised in many industry sectors over several years as a means of adding value and the technology is well-established in the manufacturing industry in terms of process/machining monitoring. However, it is through connectivity and being able to visualise and share that data with other users that the technology can be taken to a new level.

It has been possible to monitor individual machines used in metalworking production for some time, but the next stage in this journey is to monitor and share with other interested parties precisely what is happening in the machining process. Now we can 'listen' to the machine tool, collect data, interpret it, visualise what's happening, asking questions such as "is the cutting tool wearing out, is the process too fast, too slow or deviating from what is expected," then send that data straight back to the machine. In this way, errors can not only be detected but corrected immediately and the machining process improved again and again until optimal

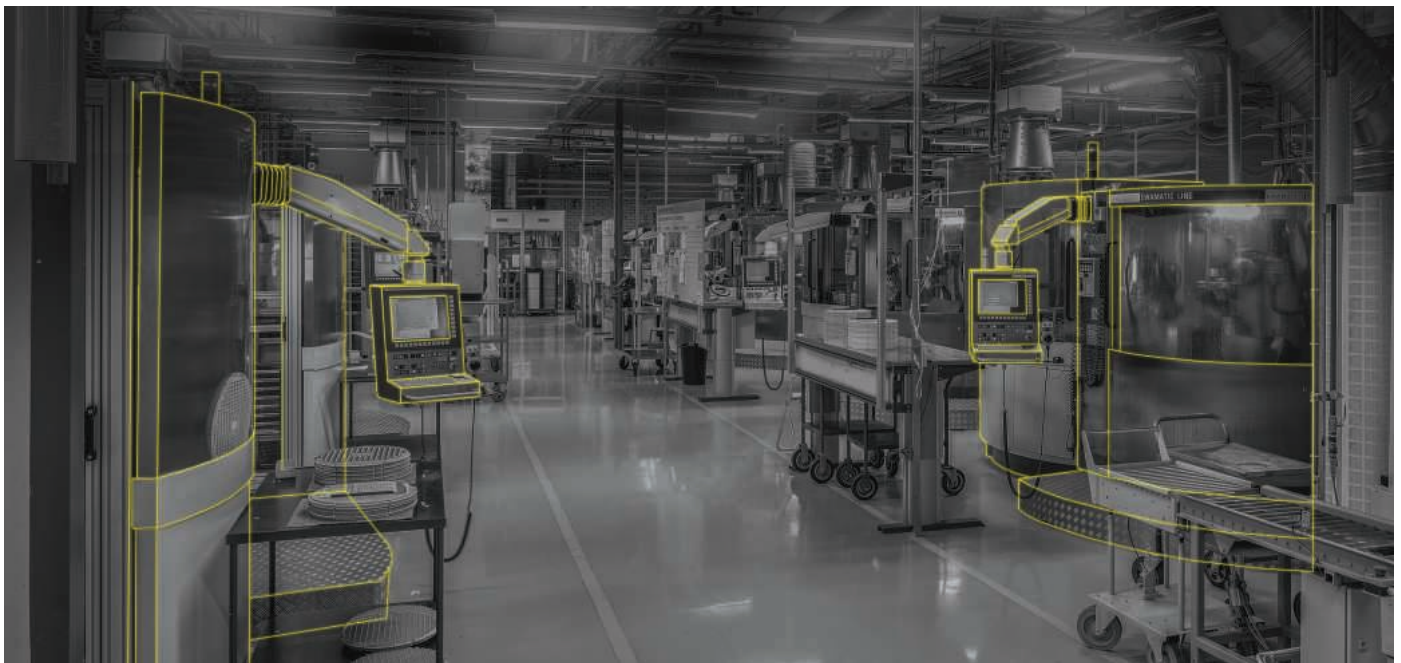
efficiency is achieved. Previously, a silo-based approach saw a single process monitoring system dedicated to a stand-alone machine with no connectivity and no possibility of upgrading when required. However, Sandvik Coromant believes it is essential to connect machines and that machining monitoring plays a vital role in interacting with the machine tool. With machines connected, updates to algorithms and software can be installed via the cloud or the company network and any upgrades can be delivered seamlessly.

With this degree of connectivity, this ability to share data, this scalable approach to machining monitoring, manufacturers have the solution to many of their problems. Benefits include reducing unplanned downtime caused by unexpected collisions, minimising tooling and repair costs by monitoring tool overload or tool breakage, and cutting idle machine time caused by missing tools. At the same time, users can now make significant increases in productivity and achieve consistent quality of the component while being able to have more precise setup limits for tools. These capabilities will benefit future users of cutting tools and machine tools and add value to traditional process monitoring.

Varied technology and different manufacturing systems

In order to increase productivity, security and quality via process/machining monitoring, the user must work with a wide range of technologies to monitor the many different aspects of the machining process and to connect to multiple systems. This could involve various network devices, the Cloud, several kinds of software and much more. Such a high level of machining connectivity requires either total standardisation of connections, which realistically may still be a long way off, or a significant level of integration.

Whether it will ever be possible to achieve completely error-free production processes, cutting tool and tooling systems specialist Sandvik Coromant has been pushing the boundaries governing this field and developed systems and solutions that enable manufacturers to gain a competitive edge through machining monitoring and effective use of data. In terms of setting and monitoring cutting tool limits or cycle limits, Sandvik Coromant has such vast experience in cutting tool technology that it can bring extra value to the machining monitoring process, eliminating the need for users to set the limits themselves.



Connected machines at Sandvik Coromant's GIMO factory: With machines connected, software and algorithm updates can be installed seamlessly via the cloud or the network



Armed with powerful machine level process monitoring data, users of connected machines can predict and avoid collisions while improving maintenance control for extending the working life of machine tool parts

Key differentiating factors in the highly competitive manufacturing industry are who has the most accurate and rapid response times combined with the least number of false alarms during production. Halting the machining process for no reason incurs huge costs and used to be all too commonplace in metalworking when there were no algorithms capable of interpreting the signals that a machine generated. A great deal of competence is needed in collecting signals and interpreting them within milliseconds and traditionally it is the user who has had to do this. However, while such expertise is capable of taking process monitoring to the next level, understanding what these limits are requires decades of knowledge.

Real-time monitoring and sustainability

An added value of machining monitoring is the ability to utilise tools fully, which in turn increases the quality of components and shortens lead times. Another vital benefit that machining monitoring brings is that it reduces energy consumption, making it an environmentally sustainable technology while cutting costs by putting greater control in the hands of the user.

Without such a high level of control, it is easy for the user to be plagued with a wide range of disturbances in the machining process that can waste energy and resources. These can include incorrect tool offsets, incorrect work offsets or improper tool change position. Other issues might be a loosely clamped part, incorrect

component orientation, improper program selection, undetected tool breakage or improper tool setting. Clearly, if one of these issues can be eliminated, productivity will inevitably improve, but imagine the quantum leap in efficiency if all of these problems could be solved.

Likewise, continuous process control does away with low process security, suboptimal component quality and under-used tools. A machining monitoring system makes sure a tool is not only present but also not broken and that a process is running within its correct parameters. The system takes corrective action if necessary, sends warning messages to avoid wear and breakage taking place, and stops the machining process if a tool breaks or is missing. This also reduces scrapage which is very important in such sectors as the aerospace industry where materials are expensive.

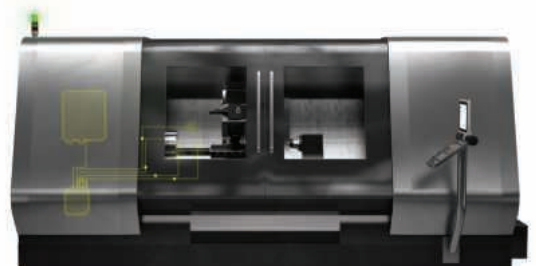
Armed with powerful machine level process monitoring data, users can predict and avoid collisions while improving maintenance control for extending the working life of machine tool parts. In the same way, monitoring at the component level helps to achieve consistent quality of the part produced. Likewise, tool level monitoring can deliver superior tool utilisation, better prediction of cost per component, correct tool inventory levels and markedly higher machine utilisation.

Conclusion

In metalworking, the days of low process security, sub-optimal component quality and under-utilised tools are on the way to being eliminated. Lack of control leads to increased costs but continuous process control through machining monitoring brings greater efficiency and, therefore, reduces costs. Also, tool level monitoring gives optimal tool utilisation, correct tool inventory levels, more accurate prediction of component costs and higher machine utilisation.

With the Sandvik Coromant approach to machining process monitoring, the aim is that machine utilisation levels can become as high as 85 percent, due to the elimination of unplanned machine stops. At the same time, metal removal efficiency could come to reach as high as 95 percent with Sandvik's machine learning process, compared to the 80 percent available with conventional manufacturing.

Like many other manufacturing processes, machining has its own major causes of instability. However, these are countered by machining process monitoring being able to 'listen' to what is happening in the environment, check if everything is going as it should and correct any deviations.



Universal turning centre with connections to a monitor can help the user to deliver optimum tool utilisation

By bringing instability down to an absolute minimum, machining process monitoring can be the catalyst for significant change in the manufacturing industry.

Find out more at:

www.sandvik.coromant.com/en-gb/campaigns/pages/coroplus.aspx

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Solid carbide milling – always the right choice from WNT

The right cutter for the right job makes perfect sense and, with WNT's extended range of solid carbide milling, getting that choice right has never been easier. Customers have an initial choice between WNT's Mastertool series and Standard series cutters.

Cutters from the Mastertool series are premium quality tools for high performance. They have been designed for specific applications and generate exceptional performance as a result. Customers that operate under challenging conditions that place high demands on production and quality should consider the Mastertool series as a starting point. For more conventional, less demanding, applications where high quality cutting tools are still important, there is the WNT Standard series. WNT's Standard series is the default for the majority of its customers faced with standard applications, but who still require guaranteed optimum performance.

The WNT Mastertool series of solid carbide cutters includes the CircularLine and BlueLine ranges. CircularLine cutters deliver shorter machining times and longer tool life and are the 'go-to' choice for trochoidal milling where extended tool engagement and consistent average chip thickness are key. The design of WNT's CircularLine cutters ensures optimum and effective machining processes. The latest addition to the range, the CircularLine CCR-UNI is available for universal trochoidal milling as a 4 x D end mill and a 3 x D end mill with a shorter chip breaker, to provide maximum

chip evacuation dependent on application.

The WNT BlueLine range has been developed for hard machining up to 65HRC and includes a mix of end mills, ball-nosed end mills and torus cutters with a variety of flute lengths. Also included in the BlueLine range is a series of micro end mills and ball-nosed end mills from 0.2 mm to 3.0 mm diameter.

Included in the WNT Standard series are the renowned HPC cutters. These high-quality end mills and ball-nosed end mills provide high levels of productivity and process security. WNT has recently extended the range to add even greater choice and flexibility when machining more standard parts and materials, with a wider choice of diameter/length combinations and cutters with specific corner radii available to machine steel and stainless steel as standard.

The WNT sliding head tooling catalogue to make UK premiere at Star Open House

Visitors to the Star GB Open House on 10-12 October will be among the first to witness the new sliding head tooling catalogue from WNT (UK). Unveiled at EMO this catalogue contains over 11,000 items, 5,000 of which are brand new to the WNT range and offer significant advantages to those using sliding head machine technology. Customers can register to attend the Open house at <https://www.stargb.com/open>

Among the new products featured are, solid carbide slitting saws, new grades for DECO-style tools, an extensive range of guide bushes and collets. Also of particular interest is the new XHeadClamp system of interchangeable tools, that allows inserts or styles of tool to be changed in less than five seconds, with guaranteed positioning of the cutting edge, saving valuable production time. WNT's System SOGX series of turning



inserts provide four cutting edges tangentially mounted in the holder to provide an extremely stable process under extreme cutting conditions, with the option of application-oriented coolant supply.

In addition to the new catalogue, WNT will also be demonstrating its latest tool vending solution, the Tool-o-Mat 840. The versatile vending system can stock up to 840 individual items and provide detailed reporting on usage and stock levels. Star GB will give the UK premiere to its Star SR-20JII Type B, as well as demonstrations of its innovative High Frequency Turning software for better swarf management, along with live demonstrations on eight machines.

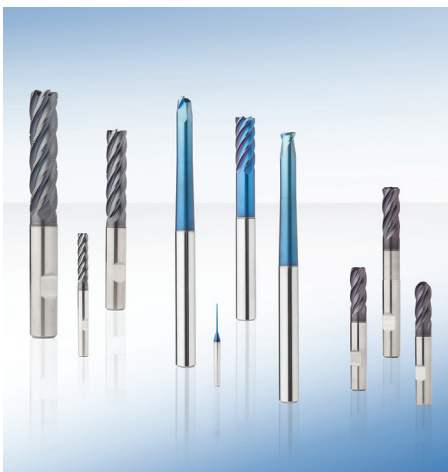
An added incentive to attend is that the first 50 customers that place an order for £100 of tooling from the WNT sliding head catalogue at the event will receive an additional £100 worth of tools of their choice, free of charge. They will also be presented with a WNT/Star GB branded Mitutoyo digital caliper.

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Xpress tool service lets aerospace customers tackle titanium in style

The saying 'good things come to those who wait' no longer means extended delivery times for Walter GB's aerospace customers who require special-purpose tool designs to tackle the upsurge in titanium machining, as well as the machining of aluminium workpieces.

Walter's Xpress service now offers customer-specific solid carbide tooling within a maximum of three weeks.

The increasing use of titanium, especially for structural components such as doors, and door frame surrounds, landing gear supports, undercarriage struts and landing flap tracks, is placing further machining demands on the aerospace industry, says tooling expert Walter GB. These challenges include: the material is more difficult to machine; its high chemical reactivity leads to chips/swarf being fused at the cutting edge during machining; its poor thermal conductivity allows temperatures at the cutting edge to be significantly higher, which means the chips/swarf are often extremely tough and abrasive.

Together with material solidification in the machining zone, this all combines to reduce tool life, especially at low cutting speeds.

However, Walter's ongoing tool development work is providing answers to all these problems and in some cases extending tool life by more than 100 percent.

For example, the Prototyp Ti38 Z6-10 solid carbide milling cutter with newly-developed substrate and PVD coating can operate at cutting speeds of up to 140 m/min. Multi-tooth solutions with up to ten teeth allow the feed to be increased by up to 50 percent.

The result is an increase in metal removal rates of up to 50 percent compared to conventional solutions.

In one case, tool life on a titanium window frame having a tensile strength of 1,250 N/mm² has been raised by 154 percent, from 175 minutes to 444 minutes, when semi-finishing and finishing using a Prototyp Ti40.

Using a Prototyp HDC Ti38 L for finishing the outer contour, extended tool life by 116 percent. In addition, cutting speed increased by 25 percent and machining



Increased metal removal rates and extended tool life are being achieved with Walter's Prototyp Ti38 (above) and Ti40 milling cutters (below)

volume rose by 23 percent. Also, the use of Walter's CVD coating technology for its WSM45X indexable insert cutting tool material, which for instance is used in the Walter Blaxx M3255 porcupine milling cutter, means that cutting speeds can reach 65 m/min and tool life can be extended to up to 130 minutes in the machining of titanium structural components.

These are typically machined using a combination of full slotting and climb milling at a cutting speed of 45 m/min and a feed of 0.12 mm. A further option is to increase the cutting speed to 65 m/min with a constant tool life of around 60 minutes.

Finish milling can also be carried out with PCD (polycrystalline diamond) cutting edges, which are among the hardest materials known.

However, appropriate coolant strategies must accompany the use of such tools, to

keep the machining temperature at the cutting edge under 600 °C, adds Walter GB. The cooling medium must be applied as directly as possible into the working zone, which is facilitated by special coolant-through holes in the tools. The application of coolant at 70 bar and cryogenic cooling are also especially relevant here.

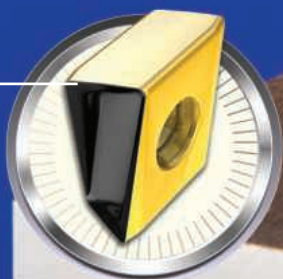
Customers of the Xpress tool service can use the my.Walter software to design the tool online. This is followed by an email quote for the purpose-made tool along with a 2D drawing and 3D model within an hour!

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Cored holes: direct tapping with no tool breakage

Yamawa has introduced the new family of ACHSP taps that enables significant reduction of production time in the manufacturing of aluminum workpieces that require threading of cored holes. The time reduction is possible because ACHSP taps allow tapping directly, skipping the calibration phase and at the same time eliminating the risk of tool breakage.

ACHSP taps feature a special frontal cutting edge enabling calibration of the cored hole, bypassing the need for an intermediate drilling phases and reducing drastically the risk of tool breakage, usually very frequent because of the reduced or irregular dimensions of the cored holes.

Besides the frontal cutting edge ACHSP taps performances are enabled by a few more innovative design features, including: a specific frontal cutting edge geometry; through coolant and the combination of an ultrafine grain carbide substrate with a film of special coating to reduce to minimum both tool wear and chipping; reinforced shank to improve tap rigidity.

ACHSP taps allow stable machining even at very high cutting speed (30÷50 m/min). High cutting speed, together with the elimination of the calibration phase, translates a significant reduction of machining time for each component produced, without impacting the quality of production or process stability.

This new type of tap provides the ideal solution for aluminum parts machining in areas with mass production requiring a high number of threads, for example the automotive industry.



"The continuous research for solutions enabling productivity increase and production process stability are more and more a priority for manufacturers of a segment particularly competitive such as the metalworking industry," explains Alessandro Sorgato, CEO Yamawa Europe.

"Answering this key requirement, Yamawa has developed the ACHSP range, specifically designed to optimise the production cycle of an application which is becoming increasingly common in mass production segments," he adds. "The development of this range is another important step taken by Yamawa to reinforce its approach to listening and addressing customers' needs. We start from specific needs and we end up with solid and specific solutions."

ACHSP taps are immediately available starting with size M6x1, M8x1.25, M10x1.5 and M10x1.25.

Headquartered in Tokyo, Yamawa is a world leader in threading tools manufacturing with 4 highly specialised factories all located in Japan. With a monthly production capacity of over 1,600,000 taps, Yamawa differentiates itself for focusing entirely on threading solutions, massive R&D investments and its excellent Quality Control process, built over a rigorously defined protocol including triple quality control on 100 percent production and the regular control of the machines' calibration.

The Yonezawa Plant is the main manufacturing plant within the Yamawa group, features a fully-equipped testing centre, while the Fukushima Plant, in addition to the manufacturing of cutting tools, features the R&D centre for the products of Yamawa group, as well as a machine shop where grinding machines for Yamawa group are manufactured. The plant is equipped with a central oil supply system as well as the most modern heat treatment



facilities. Designed for mass production and equipped with the most advanced machine tools, the Aizu plant set a reference for its fully-automatised process. The output of Aizu plant comprises taps, centre drills and carbide taps. Finally, the Tsutsumi Plant is the latest plant to become operative, delivering blanks to all the plants belonging to the Yamawa group.

Yamawa threading solutions are known worldwide for their excellent quality and precision resulting in customers' overall lower cost per thread and reliability of production processes.

Founded in Japan in 1923, in January 2016, Yamawa started operations of Yamawa Europe, based in Mestre-Venezia, Italy, in order to make the whole potential of Yamawa product range and know-how easily and more rapidly also available to customers in Europe.

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 **mitsubishi MATERIALS**

New diamond-tipped boring tools

Diamond-tipped Supermini and Mini tools with internal cooling directly to the cutting edge are the latest additions to the products Horn offers for boring, profiling and grooving.

The new ranges of insert tooling are well suited to machining aluminium, sintered carbide, ceramics and plastics. The tools are also designed for tackling non-ferrous materials that are either very abrasive due to their high silicon content or have a tendency to exhibit chipping problems and form built-up edges.

Supermini tools with CVD-D or PCD cutting edges are available in diameters

from 1.5 mm and with three different geometries to suit the application. H0 geometry with a rake angle of zero degrees is for machining hard, brittle materials such as carbides, pre-sintered ceramic materials, graphite and short-chipping brass.

H5 geometry with a rake angle of 5 degrees is used to machine abrasive and soft materials, including aluminium alloys with a high silicon content, fibre-reinforced plastics and other plastics with abrasive content. Diamond is also used successfully as a cutting material without chipping problems when working with precious metals and non-ferrous heavy metals such as platinum, iridium, gold, tantalum and titanium, as well as sintered metals like tungsten copper.

The specially developed, active HF chip breaker geometry solves virtually all machining problems caused by uncontrolled, stringy swarf. It is intended for use on long-chipping,



non-ferrous metals such as all wrought aluminium alloys, and also copper and its alloys such as bronze and both lead-free and low-lead (long-chipping) brass.

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Floyd jets out more innovation

Floyd Automatic Tooling has introduced further innovation with its new VARIO-Jet automatic coolant nozzle from Hirt Line. With the UK's first retrofitted and freely programmable coolant nozzle with automatic data exchange via the tool offset of the machine, Floyd Automatic is certain to keep the coolant flowing to the cutting edge with this unique innovation. The challenge for manufacturers running machine tools with multiple cutting tools used on a single component is how to keep the coolant flowing directly to the cutting edge with continually changing tool lengths and diameters.

For example, coolant hoses can be directed at the cutting edge of a tool protruding 60 mm from the spindle nose. However, the next tool from the carousel may have a protrusion of 100, 150 or even beyond 200 mm. The result is the coolant jet will not remain targeted at the cutting edge due to the ever changing tool length parameters. Insufficient coolant supply can create excessive heating of the contact area,

poor swarf clearance, diminishing tool life and consequently inconsistent tool life.

To enhance tool life, machining performance, surface finishes and even prolong the life of the fluid, the VARIO-Jet guarantees that coolant is always directed at the cutting area. It can be retrofitted to any machine tool with a tool offset. As standard, the VARIO-Jet is available with 20 bar pressure and an optional system is offered with 80 bar.

The VARIO-Jet has a data exchange system that operates via the tool offset RS232 or through a similar interface on the CNC control. With a brushless DC motor and encoder, the VARIO-Jet is a maintenance-free system that is available with a complete line of replaceable flat or circular coolant nozzles. The nozzles can rotate at up to 35 degrees, so coolant is optimally delivered to the cutting edge of tools of all lengths and diameters.

Only requiring a 'one-time' input of the parameters to complete the setup operation, the VARIO-Jet can also be



activated via Wi-Fi through a web browser or App that is compatible with smart-phones, tablets, laptops or PCs.

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The case continues for packaging experts

Craig North, managing director and Jo Buck, marketing manager, of rose plastic UK discuss innovation and progression with Engineering Subcontractor's John Barber

John – "Looking back on the last year or so, how has business been for rose plastic UK?"

Craig – "We have seen some strong growth in 2016. Our financial year runs from January to December and it's been healthy, which generally we see year on year. We are a growing business within the UK but also globally as well. The value of the Euro has obviously impacted on what we do and it's down to us to take steps to lessen the impact on the business. Overall, we have seen encouraging growth within the cutting tool market, engineering markets and industries such as medical."

John – "The company was first formed in Berlin, Germany 64 years ago. What do you feel are the key reasons behind its ongoing success?"

Craig – "It's a family business with an entrepreneurial spirit. The key factor that drives the group forward is innovation. We are constantly looking at the market to see where there is a weakness, and to fill that gap in the market with innovative products. That's been the successful strategy for the last sixty four years and is the direction the group will continue in."

John – "rose plastic offers impressive plastic packaging solutions in a number of shapes and sizes and serves key industries. Could you explain some of the key benefits for customers using your plastic packaging?"

Craig – "There are a number of benefits to our packaging. With over 3,000 line items in the catalogue, we have a huge choice for the customer that can cover many different products. Our experience sales team can give advice on the most suitable packaging for the customer's product looking at every aspect of their requirement; size, protection, cost, quantities etc."

"From experience, I have learnt that many companies spend a lot of time and investment on R&D (Research and Development) of the product itself and packaging generally comes last on the agenda. With our expertise, we can ensure they get the right packaging to suit them."



"The protection of the product is a key factor, it needs to be strong, robust and it needs to perform. It needs to be fast to assemble and with our packaging it will be a tube or box and you can pop a product in, stick a label on and it's done. Time saving in assembly is a huge benefit with our products."

John – "How important is your brand in the marketplace?"

Craig – "rose plastic is the number one brand within the cutting tool market. We are world leaders in what we do and have a very strong brand."

"The rose plastic brand is known globally and has a strong presence within the engineering market."

"The Medical brand is an up and coming key area of focus for us and it's our intention in the coming years to make the rose plastic medical brand as strong as both the cutting and engineering brand."

John – "The packaging options that you offer are vast and incredibly versatile. How has the packaging developed over the years?"

Craig – "Within the cutting tool industry, in

particular, the packaging is evolving all the time. The overall concept remains very similar. A telescopic tube is still a telescopic tube, however it's important that we improve on that creation. It is sometimes very difficult to try and re-invent the wheel, but you can certainly make improvements."

"We have seen that in, for example, the QuadroPack. It is the number one global seller for square, telescopic tubes within the cutting tool market. Back in 2013 rose plastic developed the new BlockPack system. BlockPack is the latest design and innovation which has improved performance, materials and is constantly evolving. We are always looking at new designs and new materials, how they perform and how they perform in different temperatures."

John – "How important is sustainability to a range of packaging products?"

Craig – "I think it depends on which markets. In some markets the product needs to be packed for its full life especially for engineering components. More and more clients are looking at re-usability. Taking the products, using them and then recycling them within the production facility itself."

John – “You offer over 3,000 standard products and work with customers to develop their own unique packaging. Could you explain how this process works?”

Craig – “Our success has always come from offering standard products. Standard products account for the majority of our sales globally and it gives the customer the chance of having a rose plastic product off the shelf without having heavy investment, large lead times or design costs. This accounts for a large majority of the work that we do and we do have a number of larger clients like Sandvik and Bosch who require a complete, bespoke solution.”

Jo – “The standard ranges can be adapted to give the customer a bespoke feel. Ideally, the customer would provide us with a photo or a drawing of what they are trying to pack and then we can look at the range, with our knowledge, and provide them with options. We can then advise on colour choices, if they require foam inserts and if they want them branded. There are lots and lots of different options.”

John – “What can customers expect from rose plastic when it comes to service?”

Jo – “They can expect to get a high standard of customer service. We try to meet our customers’ needs within the best timeframes and to work to their lead times as much as we can. If there is a problem we will work with the problem to rectify it, adapt or even change a product to suit what they need. From the customers initial contact our support is ongoing and we always do our best to achieve the requirement.”



Craig – “The key in today’s fast moving market is to have a fast, off-the-shelf solution ready for them. That is something we pride ourselves on in the UK. We have the largest stock of any cutting tool packaging supplier in the UK in order to meet our customers’ requirements. Our staff are all fully trained and many have been with us for a number of years. We can also offer customers a complete review of their current packaging and advise ways they can improve in order to save time and money in order to improve their processes. This is one of the key benefits that we offer. It is vital that products are properly protected. Customer service is key to us and is a priority.”

John – “What are some key markets for rose plastic uk?”

Craig – “We package a huge variety of different products within the cutting tool, motorsport and marine and aerospace industries to name a few. We deal with many well-known names such as McLaren, Red Bull and Mercedes for component protection. The packaging concepts that we create are very versatile and can lend themselves to a variety of different markets.”

Jo – “Some of our recent bespoke projects include packaging for professional mountain bike parts and mountaineering equipment.”

John – “Are there any markets that are particularly buoyant for your products at the moment and do you see new ones emerging?”

Craig – “Cutting tools and engineering remain our two core markets. The Engineering market continues to grow year on year for us. We want to replicate the success we have had globally in cutting tools and engineering in the medical field. We have just invested heavily in production in Germany and also in Brazil and China. We now have the capability to manufacture packaging to ISO 13485 which is the recognised, medical standard for cleanliness. Medical is emerging market for us and will be a key focus in the UK in the coming years.”

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TaeguTec provides tooling savings for FB Chain

Since employing a new managerial team, FB Chain has undergone a transformation in the last five years that has seen the Letchworth company move to a new 15,000 sq/ft factory and invest over £1 m in new plant and equipment. The manufacturer of leaf chain anchor bolts has been growing annually with support for its lights-out production facility and help from TaeguTec.

Part of the growth strategy has seen the company invest in a series of new Doosan machining centres and turning centres with Halter robotic loading systems from ETG that incorporate fully integrated FANUC robotic arms. All aimed at delivering lights-out machining and cost-efficiencies, the continuous improvement program is heavily supported by both TaeguTec and local cutting tool distributor CNC Tooling.

The strategy is paying dividends, as the Hertfordshire company has more than trebled its turnover in the last couple of years. This is on target for meeting the mid-term goal of taking FB Chain beyond £10 m by 2020.

FB Chain is part of the Scandinavian Addtech Group of companies which comprises about 120 independent companies that sell high-tech products and solutions to customers chiefly in the manufacturing and infrastructure sectors in

around 20 countries. FB Chain is a world leader in the production of leaf chain anchor bolts, used in industrial lifting sector.

In the latest chapter for the company that was formed in 1985, FB Chain initially coped with growth by adding staff and introducing an extra shift pattern to increase output. Whilst initially successful ongoing growth soon filled this extra capacity, the agent of change was the arrival of operations manager Nigel Eames. He changed the mindset of the production department and set about working faster and smarter to increase productivity further whilst reducing costs and shaving inefficiencies out of processes. This heralded the arrival of a Doosan Mynx 5400 machining centre and the UK's first Halter robotic loading system. The immediate success soon brought about the second Halter robot loading system which was added to Puma 2600 turning centre.

Nigel Eames says: "We had one man running two machines but we acknowledged that continuous production was fully reliant upon the staff. By introducing robots, we have increased productivity on one machine from less than 100 bolts a day to over 300 without increasing labour. This wasn't an overnight achievement. With the machines and automation giving us a level of unmanned machining, we realised that we had to turn our attention to our tooling suppliers to achieve true 'lights-out' production. Initially, we wanted to extend tool life, consistency and reliability with the eventual aim of also improving productivity and reducing costs."

It is here that TaeguTec stepped into the fray. Typically, FB Chain produces steel leaf chain anchor bolts from M10 to M52 in lengths from 75 mm to 550 mm, with the bolt heads incorporating varying slot widths and features on the heads that extend to 120 mm diameter.



The first opportunity for TaeguTec to prove its expertise arrived on the Doosan Puma 10C turning centre. The existing supplier of turning tools was witnessing uncontrollable swarf issues on 817M40T steel. Unable to break the stringy swarf, TaeguTec offered a solution with its TurnRush indexable turning line.

The chip breaker geometry on TaeguTec's TT8115 grade CNMX TurnRush instantly freed the operator to undertake setting or loading tasks on other machines without constantly untangling swarf from the work envelope or disposing of stringy swarf from a single machine. From a performance perspective, the four-edged TurnRush inserts enabled FB Chain to increase tool life from two parts per-edge to three, giving a total of 12 parts per insert as opposed to the previous two parts. Additionally, the feed per revolution was increased from 0.3 mm to 0.38 mm, resulting in a 20 percent cycle time improvement as well as a 20 percent cost saving of over £900 per batch of 1,000 bolts. This successful first step gave TaeguTec and CNC Tooling an opportunity to trial more tools.

Also in the turning department, engineers from TaeguTec and CNC Tooling turned their attention to a Doosan Puma DC2100 turning centre that was also suffering from excessive downtime caused by swarf wrapping around the parts and tools as well as the consequent swarf clearance. Applying a single edged T-Clamp part-off tool



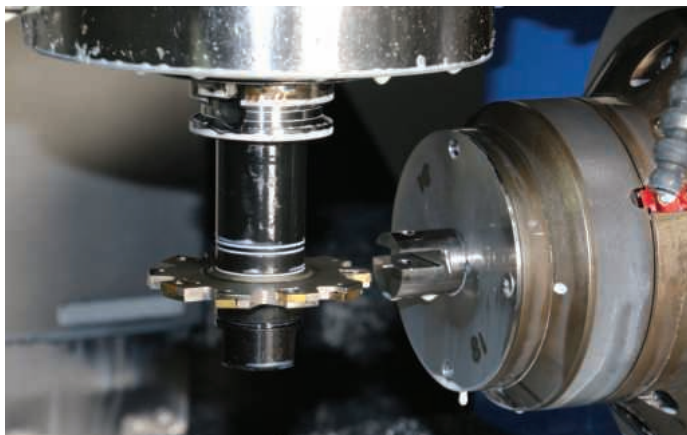
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running at a machining depth of 24 mm on a batch of 10,000 anchor bolts. TaeguTec delivered a huge improvement with its 3 mm wide TT9080 grade insert. Not only did the new TSC 3 insert extend tool life to achieve 120 parts per edge from the previous 50, the T-Clamp also increased machining parameters from 0.04 mm/rev to 0.08mm/rev, returning a significant productivity improvement whilst reducing the cost per 10,000 batch of anchor bolts by a staggering £2689.

Since this initial success, 30 employee FB Chain has now implemented the 3 and 4 mm wide T-Clamp inserts and toolholders on all its turning centres. Nigel Eames says: "We have achieved some spectacular cost reductions through trialling TaeguTec's T-Clamp and Quad Rush. However, the underlying bonus is the ability to confidently run our turning department unmanned without being concerned by swarf management issues and inconsistent tool life. We can now set our turning centres at the end of a shift and they will run unattended until the barfeeders are empty and this is often 6-8 hours of trouble-free unmanned production."

Making its first venture into the milling department, TaeguTec initially trialled its indexable head DrillRush, which was set against an industry leading drill manufacturer. Applying the 8.1 and 9.7mm diameter indexable drills, TaeguTec's DrillRush processed over 800 holes before requiring a head change. The previous vendor was using a solid carbide drill to attain an inconsistent tool life of 400 to 600 holes.

Keen to instigate further costs savings and productivity gains, TaeguTec trialled its highly regarded Top-Slot milling range for processing slots on the end of the bolts. Comparing its 10 insert 100mm diameter slotting tool against a like-for-like rival, TaeguTec engineer John Handley doubled the parts per insert edge from 300 to 600, resulting in over 2400 parts for each set of the four-sided inserts compared to the competitors paltry 1200 parts.

Additionally, the Top-Slot increased the feed rate from 0.07 to 0.11mm/tooth, reducing the cycle time from 1 minute per part to 32 seconds. On a regular batch of 5,000 bolts, the Top-Slot has reduced the insert cost per batch by over £240 while the improved cycle time has resulted in a total saving of £1400 per batch, a 38 percent improvement.

"Compared to a competitor tool that was obtaining a tool life of 120 minutes production, the Top-Slot is achieving 250 minutes per insert edge and this is what we need for lights-out production," continues Nigel Eames.

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New series of cutting materials for the milling of cast iron grades

The extensive MAPAL portfolio of ISO tools for milling operations has now been extended with the addition of a new range of cast iron insert grades that cover the bandwidth from GJL and GJV to GJS.

The new inserts provide a significant increase in tool life and a consequent result of improved cost-effectiveness. Moreover, the new product line facilitates higher cutting speeds that will maximise productivity. The insert series is based on a

mounted tangential indexable inserts that enhance the economic benefits of the new grades. For unprecedented levels of cost-effectiveness, radial eight-edged inserts can be allocated to MAPAL's 45 degree face mill cutters with an astounding cutting depth of up to 10 mm.

The flexibility to work with the numerous tool holder geometries is afforded by the availability of sintered tangential inserts with four, six or eight cutting edges that are

A special post-treatment has been developed for both the PVD coating and the CVD coating to ensure an extremely smooth surface. This improves chip flow and the evacuation from the work envelope, which minimises tribo-chemical wear. With the CVD coating, the post-treatment additionally sets a selective intrinsic stress in the coating, stabilising the cutting edge or increasing the ductility of the cutting material.



completely new series of carbide substrates. The structures of the carbides have been modelled in such a way that they provide an optimum relationship between ductility and wear resistance.

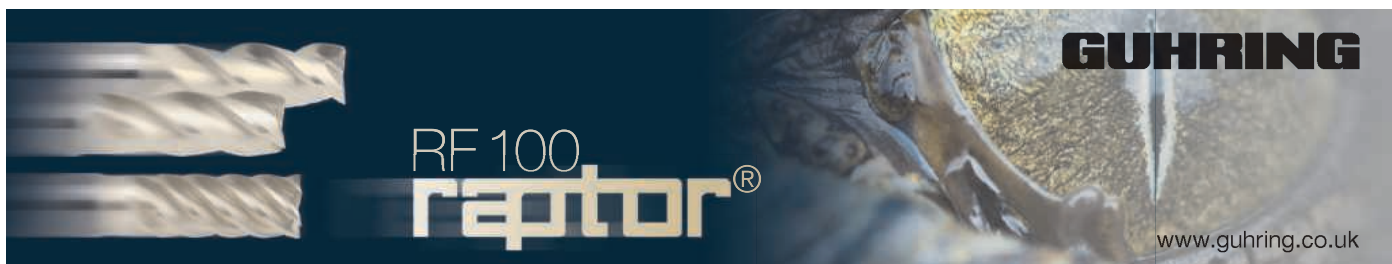
To maximise the scope of the new grades, MAPAL has engineered the new ISO insert lines to correspond with existing 75 degree face mill cutters, as well as MAPAL's renowned 90 degree tangential shoulder milling tools with a tight pitch designation for high feed machining. The new inserts can also be allocated to 45 and 88 degree shoulder milling tools with alternately

suitable for everything from heavy duty rough machining through to semi-finishing operations.

The insert series includes three PVD-coated carbides and two CVD-coated grades. The PVD coating consists of an optimised TiAlCrN with very fine structuring of the layers to create an optimum relationship between ductility and hardness/wear resistance. The CVD coating is based on an MT-TiCN with an alpha-Al₂O₃ top coat. This layer combination offers high wear resistance and good thermal stability.

The optimum cutting material for the milling of cast iron grades is therefore available for everything from dry to wet machining and for a very wide range of applications and machine conditions. So, if you want to benefit from a three-fold tool life improvement whilst generating higher cutting speeds and feeds - its time to look at the MAPAL cast iron milling series.

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Tungaloy expands DoFeed to include new grades

Tungaloy Corporation is continuously expanding its highly reputed DoFeed series. The latest addition includes inserts in the AH8015 grades.

DoFeed is a high feed milling cutter series with a close-pitched insert alignment, intended for various applications where an efficient removal of large stock is required, such as profiling and pocketing processes in die and mould shops. The ingenious double-sided insert geometry brings benefits in tool economy and productivity and has been earning customers' confidence in recent years.



The series already has an ample lineup of inserts and cutter bodies, intended for milling various materials including steel, stainless steel, cast iron, and heat-resistant super alloys. Backed by popular demands and market requests for machining hard materials over HRC50, a new insert line of the AH8015 grade now joins the product family.

AH8015 is a PVD grade with a coating composition of AlTiN. The multi-layered coating configuration with high aluminum content improves resistance to chipping and built-up edge, improving machinability for smearing materials typically used in the die and mould industry. An extremely hard sub-micron carbide grade is used for the substrate for vastly improved wear resistance.

Features and benefits include: high insert density enables milling at high feed rates for maximum machining efficiency; AH8015 boosts the insert's resistance to wear and built-up edge, optimising it for milling hard materials, as well as steel, cast iron, and heat resistant super alloys.

Tungaloy is one of the world's leading manufacturers of carbide cutting tools, friction materials, wear resistant items, and civil engineering products.

Headquartered in Japan, it provides solutions to customers all over the world in the automobile, construction, aerospace, medical, power generation, infrastructure and heavy industries.

Continuous improvement of production technologies, combined with large investments in research and development, allows Tungaloy to offer high-quality products that help manufacturing companies in a wide variety of industries increase their productivity.

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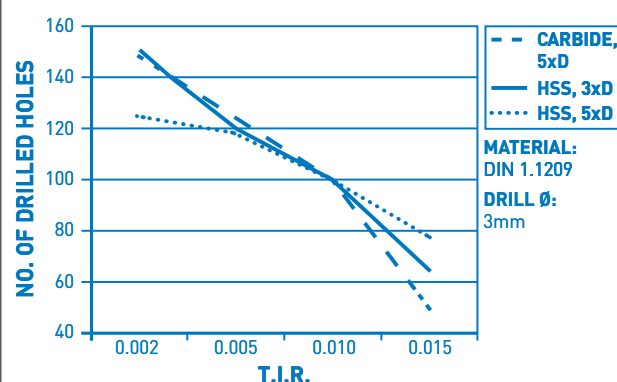


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Compact high-speed chamfer cutter from BIG KAISER

Now available from Industrial Tooling Corporation (ITC) is the new BIG KAISER C-Cutter Mini, an ultra-fast compact chamfer cutter for improving productivity, precision, surface finishes and tool life.

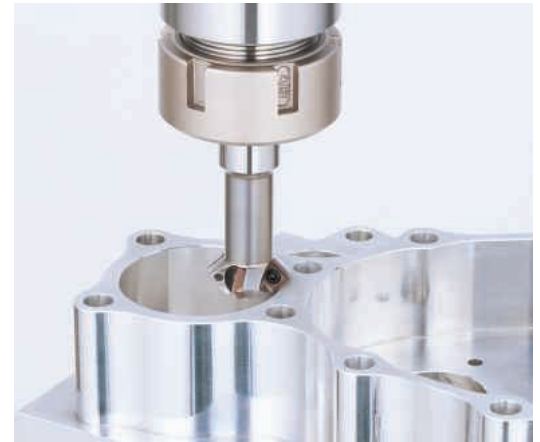
Designed and developed by BIG KAISER, a global leader in premium high-precision tooling systems and solutions for the metal-working industries, the new C-Cutter Mini is designed for multi-functional cutting tasks, including chamfering, back chamfering and face milling.

Compared to competitor products, the tool's market-leading speed and feed rate capability has the potential to slash machining times by up to 85 percent. This remarkable productivity improvement is credit to the tool's innovative design that reduces the cutting diameter down to the lowest limit. This enables impressive ultra-high spindle speeds and feed rates. Cutting speed is further increased by the new wear-resistant inserts with multi-layer Physical Vapour Deposition (PVD) coating.

Available in single insert and four insert configurations, the C-Cutter mini provides

additional flexibility for the customer. Increasing the number of inserts from one or two per cutter to four, multiplies the feed rate and this significantly speeds up operations and improves productivity. The new C-Cutter Mini that is available in the UK from ITC also marks the introduction of the world's smallest hex insert, with a diameter of 3.97 mm. This particularly small dimension enables highly-efficient back chamfering from a 6 mm starting hole diameter, whilst the three-corner insert design reduces costs.

Giampaolo Roccatello, VP Sales at BIG KAISER, says: "The new C-Cutter Mini delivers a 'triple effect', essentially compounding the benefits of the four inserts. It delivers faster feed rates and the reduced diameter raises the spindle speed whilst the new PVD coating enables higher cutting speeds. This tool is a prime example of how BIG KAISER's focus on innovation consistently delivers tangible results to our customers."



For further details on how the new BIG KAISER C-Cutter from ITC will enhance your machining performance and productivity, contact:

Industrial Tooling Corporation (ITC)
Tel: 01827 304500
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www.itc-ltd.co.uk

High precision smaller workpiece machining with AC1030U turning inserts

AC1030U is the latest turning insert development from Sumitomo Electric Hardmetal targeted at high precision small workpiece machining that covers a wide range of material types where improved levels of surface finish are required. This is achieved by embracing a special high precision grind to the cutting edge and the incorporation of Sumitomo's Absotech Bronze multi-layer coating, which not only helps resist micro-chipping problems but contributes to extended levels of consistent production.

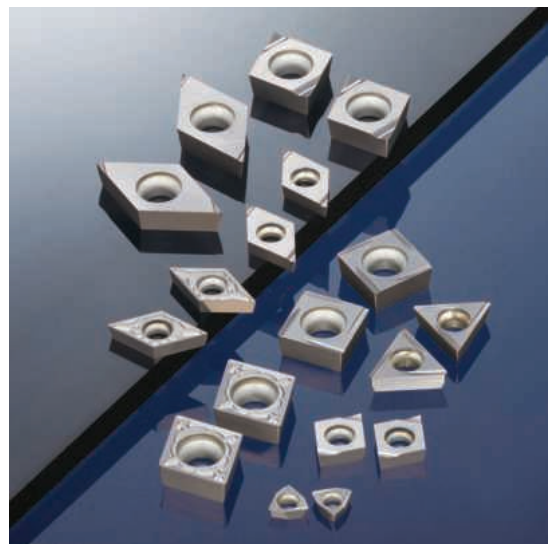
The new turning insert grade combination of Absotech Bronze physical deposition coating (PVD) and Sumitomo's latest precision ground FYS, a narrow breaker width G-class chipbreaker development to aid chip control and help to ensure a stable operational strategy.

AC1030U inserts can be used for both turning and grooving of smaller inner diameter bores on workpieces produced from alloy, stainless and heat resistant

steels, pure iron, mild steels as well as non-ferrous materials where chip control is difficult to manage.

The advanced Absotech Bronze technology comprises five alternate layers of TiAlSiN and AlTiSiN coatings which are applied to a special tough carbide substrate that has double the fracture resistance of more conventional substrates. The coating has excellent heat and oxidation resistance with high orders of adhesion strength and resistance to peeling-off as it has improved boundary control between the coating and the carbide substrate.

Inserts are available in triangular negative plus GNDS grooving types with cutting widths of 1.5, 2 and 3 mm. Positive inserts range across 80-, 55- and 35-degree diamond, as well as square, triangular and trigon types. All inserts have a selection of different nose radii available.

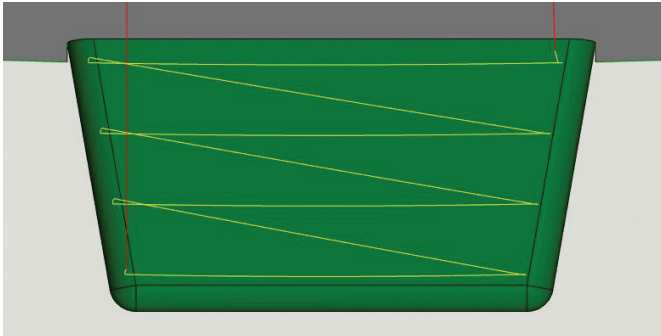


Sumitomo's AC1030U turning insert is targeted towards high precision small workpiece machining where high orders of surface finish are required

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End mill innovation provides quick solution for material removal

The rise of innovative 5-axis machining strategies from leading CAM vendors that focus upon maximum material removal rates has seen cutting tool manufacturers slip behind the curve with respect to tool geometry developments for such strategies. That was until Quickgrind launched its ground-breaking Eliminator Series of end mills.



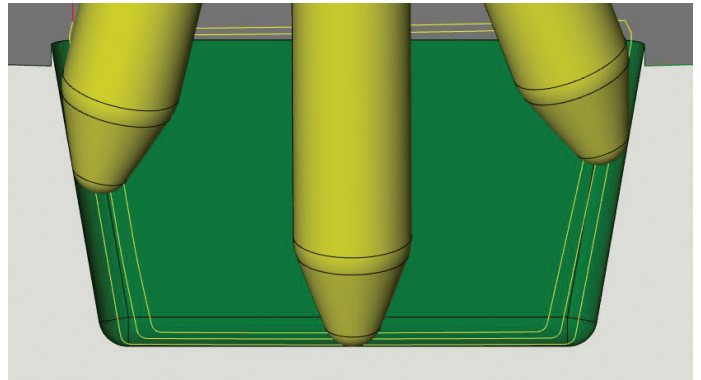
Referred to as conical barrel tools, the new series of Eliminator end mills for 5-axis machining incorporate a conical or tapered form that will deliver a cycle time reduction of up to 95 percent. This bold claim is substantiated by the ability of the Eliminator to significantly reduce tool path distances whilst utilising the full flute length to increase the step-down rate and the subsequent material removal rates.

The new Eliminator conical barrel tools are suited to semi-finish and finish machining processes on a wide range of components and materials that span the mould & die, motorsport, medical, oil & gas and particularly the aerospace sector and turbine blade production. The solid carbide end mills are available uncoated or with Quickgrind's Type D geometry with an MX coating for the machining of low and medium alloy steel, tool steel, cast iron and hardened steels whilst the Type S end mills are XRED coated for the high-performance machining of high temperature alloys such as Inconel, Hastelloy and titanium, as well as the complete range of stainless steels.

To benefit from such huge cycle time reductions, manufacturers must first be utilising 5-axis machine tools and Quickgrind recommends that secondly, machine shops are implementing ground breaking machining strategies from leading CAM vendors. To investigate the best exploitation of machining strategies, Quickgrind can offer support through its QuickCAMPro engineering service.

The highly flexible conical barrel tools can be used as a direct replacement for ball nose and standard end mills that are used for scanning, profiling, pocket milling and machining hard to access surfaces. This multi-purpose solution offers customers complete side machining as well as ball nose cutting. The tool paths and step-over rates will deliver unparalleled benefits whilst the ball and side cutting geometry will reduce tool inventory requirements for end users. Furthermore, the unique Quickgrind Eliminator geometry reduces the potential for thermal deformation, dissipating the heat from the cutting edges with maximum efficiency. This extends tool life drastically and simultaneously improves surface finishes and the consistency of the end mill performance.

The Eliminator series is available as a 3 or 4 flute tool. The three-flute and four-flute end mills are offered with a shank



diameter of 6, 8, 10, 12 and 16 mm that respectively tapers down to a ball nose diameter of 1, 2, 3 and 4 mm with a flute radius of 250, 500, 1,000 and 1,500mm. These end mills are provided with an overall length from 58 to 93mm with a tapered flute length from 9.5 to 31 mm. Quickgrind prides itself on offering the best tool for the job and offers a quick turnaround for bespoke tools designed to suit the customers application. Quickgrind can also offer tools with two flutes or a flute radius of 15,000 mm and have produced tools of 1.80 mm diameter with R0.80 ball nose.

Quickgrind Ltd Tel: 01684 294090

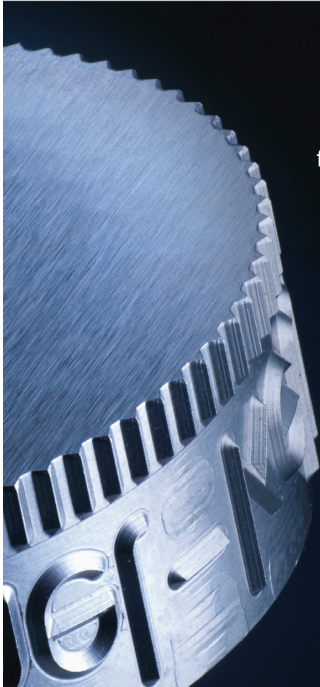
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World's first DG-UV certified gripper

SCHUNK, the world-wide competence leader for gripping systems and clamping technology, recently demonstrated why its product range is the industry benchmark at two leading events. At the Birmingham NEC, the German manufacturer showed a host of new and established Gripping, Toolholding and Workholding product lines to international visitors to Advanced Manufacturing and subcontract exhibitors at Subcon.

SCHUNK used the exhibition as an opportunity to show-off its SVH 5-finger-hand. This crowd generating product is the world's first gripper that has been certified and approved by the German Social Accident Insurance Association (DGUV) for collaborative operation. By obtaining this certification, the SCHUNK SVH 5-finger-hand has given SCHUNK a decisive step forward on its way towards safe human/robot collaboration.

The SCHUNK SVH 5-finger hand grips nearly as perfectly as the human hand. The electronics are completely integrated into the wrist and this allows the SCHUNK SVH 5-finger hand to simulate nearly all human hand movements. Incorporating a total of nine drives, various gripping operations and movements can be executed with high sensitivity. The elastic gripping surfaces ensure a reliable grip on all types of objects. The SCHUNK SVH can be connected to industry-standard robots and lightweight robots via defined mechanical interfaces. This impressive hand was particularly busy at the exhibition greeting stand visitors with countless handshakes and gestures.



Another industry first presented to the visitors at Advanced Manufacturing and Subcon, SCHUNK also introduced the TENDO Slim 4ax, the world's first hydraulic expansion toolholder in standardised heat shrinking contour.

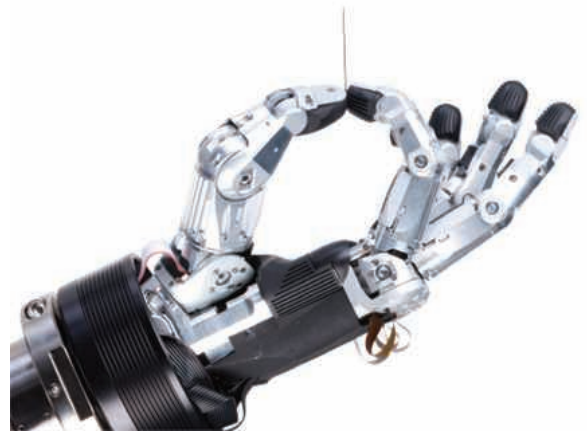
The SCHUNK TENDO Slim 4ax hydraulic expansion toolholder combines the complete outside geometry of heat shrinking mountings according to DIN 69882-8 with the impressive qualities of the SCHUNK hydraulic expansion technology. The SCHUNK vibration-damping hydraulic system ensures a high surface quality, protects the spindle, increases tool life and subsequently reduces manufacturing costs.

The TENDO Slim 4ax has a robust base body that delivers the ideal shape accuracy by means of excellent radial rigidity. The TENDO Slim 4ax was designed particularly for axial operations and demonstrates its strength and performance when drilling, countersinking, reaming and threading on 5-axis machine tools. By means of plug & work configuration, the TENDO Slim 4ax can replace heat shrink mountings without reprogramming the external contour. Another benefit is the rapid tool change using an Allen key.

SCHUNK makes chuck jaws performance promise

The SCHUNK standard Chuck Jaws range is recognised as the world's most comprehensive series, comprising over 1,200 different jaw types. Now, the leading provider of gripping systems and clamping technology is promoting this extensive range with the SCHUNK performance promise.

With more than 16 million Chuck Jaws sold worldwide and over 60,000 customised Chuck Jaw solutions available, SCHUNK is not only the competence leader but the performance and market leader. To rapidly locate your desired solution, SCHUNK has developed its Chuck Jaw Quickfinder on-line product locator. The Quickfinder enables customers to easily access the required product with easy-to-navigate drop-down menus, which includes top jaws,



quick change systems, base, plastic, monoblock and complete pendulum jaws.

Part of the performance promise is the popular SCHUNK PRONTO. The PRONTO can be retrofitted on all fine serrated lathe chucks and quick-change chucks in the sizes 200, 250, and 315, regardless of the manufacturer. This innovative system can reduce setup times by up to 95 percent. The PRONTO consists of special supporting jaws that can be combined with different quick-change inserts. These inserts allow expansion of the clamping diameter by up to 55 mm for soft jaws and by up to 45 mm for claw jaws, without having to move the base jaw.

Even more prominent is the rise of the QUETNES series of plastic jaws from SCHUNK. Developed for sensitive clamping applications, the QUETNES plastic jaws provide impressive clamping forces with maximum surface protection. The glass-fibre composite permits a high coefficient of friction and prevents clamping marks on the workpiece surface. Generating a high level of stability through its aluminium supporting structure, the lightweight and stable design makes the popular QUETNES suitable for high speed machining whilst proving a cost-effective system for low-deformation clamping of machined parts.

The SCHUNK Chuck Jaws Performance Promise guarantees that you will always receive top-notch products and the most competitive prices.

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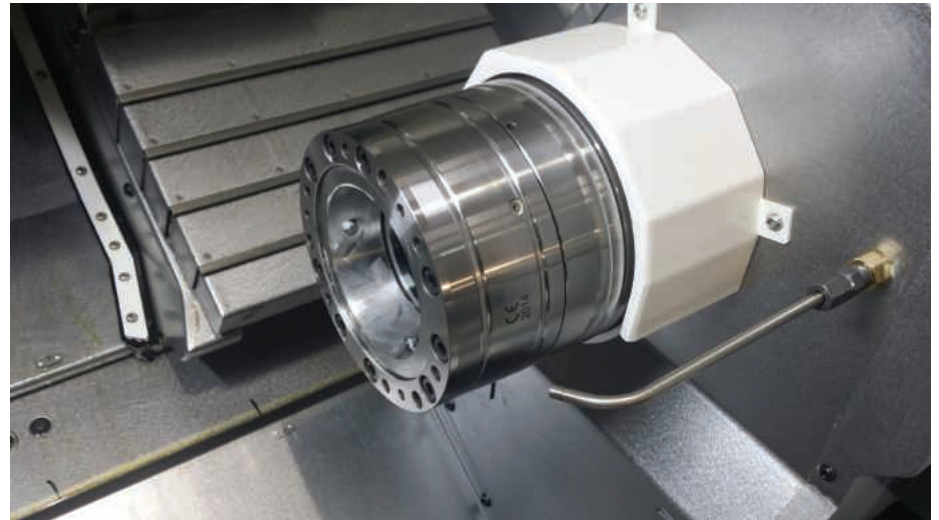
Prior takes a scientific approach to workholding

As part of a global group that designs and manufactures a wide range of scientific instrumentation such as microscope automation and optical microscopy, Prior Scientific is the epitome of precision manufacturing. The Cambridge company manufactures components on its Matsuura and Mazak machine tools that are delivered directly to its assembly department, so precision and quality in the machine shop is critical.

Manufacturing components from a range of materials that include brass, aluminium, stainless steel and PTFE, gripping the parts with sensitivity and precision whilst generating significant clamping forces is why the company opted for the Spanntop workholding system from Hainbuch. The relationship with Hainbuch dates back over a decade when the manufacturer of geological imaging, pathology, neuroscience, microscopy, cancer screening and research equipment specified Hainbuch collet chucks for its Gildemeister twin-spindle turning centre.

With increasingly complex component designs and expanding capacity demands for turned parts from the ageing 3-axis Gildemeister centre, Prior Scientific recently installed a new Mazak QT250 twin spindle turning centre with both C and Y-axis capability. Immediately alleviating the second operation and capacity issues for Prior Scientific, the company was intent on buying its workholding equipment from Hainbuch.

Prior Scientific's Machine Shop manager, Roberta Harder says: "We manufacture parts from a range of materials, diameters

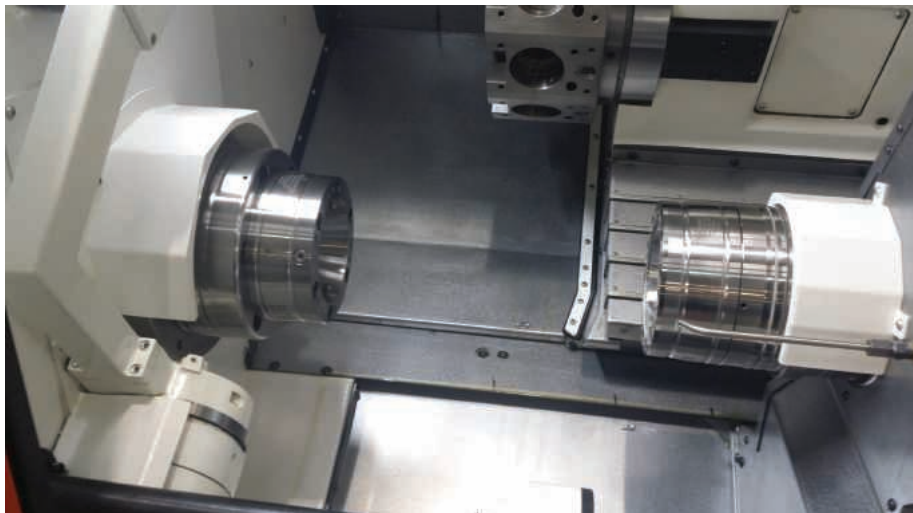


and lengths with quantities that can vary from 5 or 10 up to 200+. With frequent changeovers, we needed a quick-change system that would allow us to switch from a vast array of collet diameters up to 65 mm as well as offering the ability to clamp larger billets when necessary."

To achieve this, Hainbuch recommended its Spanntop collet chuck with the addition of its jaw module and mandrel system. By specifying the additional modules, Prior Scientific can rapidly change from a collet chuck configuration to a 3-jaw chuck with the ability to clamp billets up to 215 mm in a matter of just 30 seconds. With the Mazak QT250 being a bar-fed turning centre, the Hainbuch Spanntop system enables Prior to change from bar-fed production work that demands precision collet clamping to front loaded large billet machining with a 3-jaw chuck.

The uncompromising precision levels at Prior Scientific noted the company specifying a Hainbuch Spanntop pull-back collet chuck on the main spindle and a dead-length Spanntop collet chuck on the sub-spindle. This configuration guarantees consistent precision levels on both main and sub-spindle. To address any concerns over clamping forces and part marking, Hainbuch supplied a complete series of smooth and serrated collets. The serrated collets are applied to a vast array of component types that vary from heavy duty robust turning through to the clamping of brass that frequently causes slipping and consistency issues with oily residue and its outer skin.

Roberta Harder says: "We bought the Mazak to eliminate secondary operations which would subsequently improve quality. The other key factor was to increase productivity. The collet chucks play a vital role in both facets of our aims. Firstly, the wide range of collet and chuck options gives us great flexibility. Added to this, the fast changeover of collets and even the change from collets to the 3-jaw chuck configuration reduces non-machining times and supports our aims of optimising machine utilisation. From a quality perspective, precision clamping is assured through the zero-point configuration and the pull-back principle of the Hainbuch Spanntop Series."



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Motorised positioning tables now available in the UK

A range of new motorised positioning tables has been made available to UK engineers, after being heralded as one of the top 15 assembly technology and robotics products by a leading German expert.

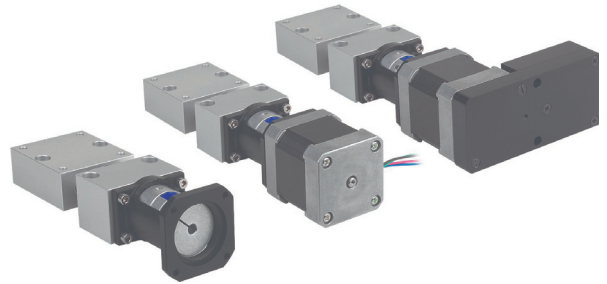
norelem UK has added the range to its BIG GREEN BOOK, a complete reference guide for design engineers, mechanical engineers, machine builders and toolmakers. Its electric-powered, low-noise, and low-maintenance motorised positioning tables are a convenient alternative to manual versions for bringing components, stops, limit switches, grippers, and even cameras into position to a hundredth of a millimetre. The range has proven effective when used in machine tools, fixture construction, handling systems and test and measurement equipment.

The new range offers engineers a vast range of options for many guiding and positioning tasks. Available in short and long-wheelbase versions, in sizes 8 and 12, the tables contain modules for motorised adjustment, suitable for traverse rates of up to 1.2 m/min, and objects weighing up to

10 kg. The components have been proven to be highly accurate, with the radial clearance of the guides less than 0.02 mm and the backlash on reversal less than 0.04 mm. Furthermore, norelem's motorised positioning tables can be used without a motor, with a stepper motor, and with stepper motor and integrated positioning control.

Key to the accuracy and adaptability of the products is their unique modular design, which allows them to be combined with other components of the same size. For example, the attachment of end position sensors can be done very easily, and proximity switches and their corresponding brackets are also very easy to integrate.

Marcus Schneck, CEO at norelem UK, comments: "The fact that our motorised positioning tables have been hailed among the top 15 standard components of German industry demonstrates their accuracy, adaptability and effectiveness. We took



great care in the design of these components to ensure they provide precise positioning, whilst also being easy to build into other components of the same size. What we have is a highly-commended range, suitable for most industrial automation applications including robotics, medical component laser machining, electronic manufacturing and other high-performance projects."

For further information, contact:

Norelem Ltd

Tel: 0121 222 5320

Email: info@norelem.co.uk

Pibomulti turns a full circle

New from Pibomulti is the 360° Auto Adjustable Angle Head, creating a highly innovative facility to implement 360° orientation of a right-angle head in either internal or external machining operations.

The 360° Auto Head has a pneumatic clutch mechanism built into the location device of the angle head. This allows the device to be unclamped and orientated to any radial position required by rotating the machine spindle. When the air is released, the angle head is then clamped and ready to start machining.

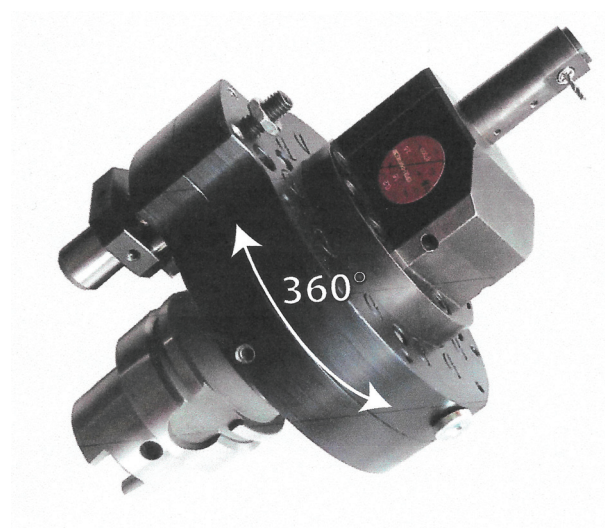
In effect, one 360° Auto Head replaces the need for additional heads set at various angles and enables drilling in any radial position. Advantages are reduced cycle times, fewer angle heads, continuity of process and high accessibility for machining in awkward locations.

Pibomulti specialises in all types of angle heads, spindle speeders, multi-spindle heads and turret heads with the extensive range available exclusively in the UK from Corsham based Gewefa UK Ltd.

Gewefa UK Ltd was established in 1990 and has rapidly established itself as the UK's leading independent supplier of toolholding and allied equipment.

Based in Corsham, Wiltshire, Gewefa UK is a subsidiary of Gewefa GmbH, a family owned business established 60 years ago in Burladingen, Germany.

As part of its development strategy, Gewefa UK has built strong relationships with leading like-minded organisations allied to its tool



The new Auto Adjustable Angle Head from Pibomulti enables 360° orientation of a right angle head when internal or external machining

holding expertise. As such, Gewefa offers its customers equipment such as angle heads, driven tools, power drawbars, collets, pre-setters and measuring equipment from some of the world's leading names, i.e. EWS, OTT-Jakob, Pibomulti, Nann and Rineck.

To view a demonstration of the Auto Head, access the Pibomulti website via **www.gewefa.co.uk** or contact:

Gewefa Tel: 01225 811666

Email: sales@gewefa.co.uk www.gewefa.co.uk

Exploiting the full potential of additive manufacturing

With consistent further development in the field of additive manufacturing by means of both powder nozzle and powder bed techniques, DMG MORI has bundled together the most important generative manufacturing processes under one roof.

Additive manufacturing has long proven its enormous potential in recent times. The annual growth rate of today's still small market is over 30 percent, even considerably higher in part in the field of metallic components. According to recent studies, additive manufacturing will grow by between 20 to 50 percent by the year 2020. In other words, the market will grow by the factor two to four. It is therefore only logical that as a leader of technology DMG MORI will be consistently involved in this development.

DMG MORI has already been operating successfully in the field of additive manufacturing with laser deposition welding with powder nozzle technology for four years now. With its recently acquired majority shareholding in REALIZER GmbH from Borchten, DMG MORI has also extended its portfolio to include powder bed technology. In this article, Patrick Diederich, at DMG MORI responsible for Advanced Technologies, explains the way that DMG MORI now presents itself as a full-service provider in the additive manufacture of metallic components:

Future-orientated and highly competitive branches are always on the lookout for innovative and cost-effective production opportunities. They are therefore often seen as the drivers of new technologies. This also applies to additive manufacturing, so it is not surprising that it is gradually being adopted in the aerospace and medical technology sectors. The USA, Europe, Korea and Japan in particular have become established here as core markets. Aircraft manufactures see great potential in the chance to reduce the weight of components. Additive manufacturing is already wide spread in medical technology production and dental laboratories, because it offers economical solutions for many different applications even with a batch size of one.

DMG MORI is established in these branches of industry primarily as a provider of metal cutting manufacturing solutions and, as a long-standing supplier for these and other innovation-driven branches, we of



LASERTEC 30 SLM: With its majority shareholding in REALIZER GmbH from Borchten, DMG MORI has extended its competence in the additive manufacturing of metallic components to include powder bed technology and already installed the first machines in the market

course always keep an eye on the future. That is why DMG MORI is also actively forging ahead with additive manufacturing."

For four years now, we have successfully combined laser deposition welding with a powder nozzle and 5-axis milling in a single setup in the form of the LASERTEC 3D series. The LASERTEC SLM technology stands for selective laser melting in a powder bed. Now, we offer both technologies under one roof and they complement each other ideally in our product range. The powder bed process has a market share of 80 percent where the additive manufacturing of metallic components is concerned.

The 5-axis LASERTEC 65 3D hybrid and the LASERTEC 4300 3D hybrid for 6-axis turn-mill machining are designed for manufacturing relatively large parts like complex turbine parts, for instance. Work areas of $\varnothing 500 \times 400$ mm in the case of the LASERTEC 65 3D hybrid and $\varnothing 660 \times 1,300$ mm for the LASERTEC 4300 3D hybrid speak for themselves, as do workpiece weights of up to 600 kg or rather 900 kg.



The build volume of the LASERTEC 30 SLM is 300 x 300 x 300 mm with a maximum loading capacity of 200 kg. Changing the powder takes only two hours.

The real revolution in the machine concept of the LASERTEC 3D hybrid series lies in the many diverse application possibilities.

In the first place, laser deposition welding and milling or rather turn-mill machining in a single setup mean that workpieces can be manufactured right through to finished part quality. Whereby the powder nozzle and milling head can be changed over at any time. Especially where complex geometries are concerned, areas can be machined that would no longer be accessible on the finished part. Such applications are called for especially in the aerospace, energy technology and die and mould branches. Added to this is the option of manufacturing components made of two or more materials.

With the powder bed technique very small, highly complex filigree parts can be manufactured by means of selective laser melting. The LASERTEC 30 SLM enables the flexible use of different materials in one machine, while an intelligent powder module concept allows the change of material in under two hours. This is where our strengths in metal-cutting production come into play. DMG MORI relies on its own milling machines for the post processing of workpieces from the powder bed. The key issue here is an expedient linking of the different technologies, both where the hardware is concerned and the software. Our development cooperation with Siemens NX for an end-to-end CAD/CAM solution will, of course, be extended to encompass the powder bed process. Integral processes are the overriding goal.

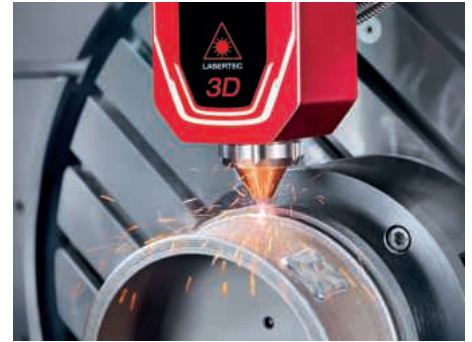
Industry 4.0 is of great importance for DMG MORI. Our 'Path of Digitization' with intelligent software solutions, including our intuitive user interface CELOS is a real driver in this field. CELOS is already used for the LASERTEC 3D hybrid machines and the industrial solution RDesigner, created by REALIZER especially for the powder bed, will also be integrated into a CELOS



With the powder bed technique very small, highly complex filigree parts can be manufactured by means of selective laser melting

interface in future. The capture and management of data and the utilisation of user-friendly apps offer a great opportunity for supporting work preparation and the production processes in their entirety. This means digitisation has a great impact on optimum utilisation of capacities and on the flexibility of a production. It enables a transition to individual mass production in industrial serial production. Spare parts, for example, no longer need to be held in stock worldwide. They can be printed virtually "on demand". Digitisation and additive manufacturing go hand in hand here and will tap great potential.

As a pioneer in metal cutting machine tools in combination with our decades of experience in laser applications, together with the expertise of REALIZER, we are ideally positioned to take on a leading role in the additive manufacture of metallic components. Added to this, in the fields of service, application and sales DMG MORI is present for customers around the world. In future DMG MORI will concentrate this expertise in the DMG MORI Additive Manufacturing Excellence Centers in Bielefeld, Pfronten, Tokio, Shanghai and Chicago. The experts there get involved in the development of the customers' products at an early stage of development. They learn together for the construction of



The powder nozzle and milling head of the LASERTEC 65 3D hybrid can be changed at any time, so that areas of complex geometries can be milled that would no longer be accessible subsequently on the finished part



future machines and components. Before the year is out, we will launch the LASERTEC 65 3D for purely laser deposition welding. The larger LASERTEC 125 3D hybrid is planned for 2018. The trend in powder bed processes is towards higher productivity, which we will achieve by means of both a larger build volume as well as with further linking and automation of the processes; in other words, with a reduction of idle times.

Design engineers will increasingly recognise the potential of additive manufacturing and will integrate the technology in their work. After all they will be able to realise workpieces in this way that they would not be able to produce with conventional manufacturing processes. That is why we view additive manufacturing as a revolutionary and expedient complement to traditional production methods. Our DMG MORI Academy also has several machines with the LASERTEC 30 SLM in Bielefeld and the LASERTEC 65 3D hybrid in Pfronten in order to give customers highly qualified trainings in ADDITIVE MANUFACTURING.



The LASERTEC 65 3D hybrid combines laser deposition welding and 5-axis milling in a single setup

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"Is your company ready to digitalise now?"

by Rob Powell, commercial director of Lantek Systems



Rob Powell, commercial director of Lantek Systems

We keep reading about digitalisation in manufacturing, but are we there yet? We might be closer than you think. Success relies on efficiency and productivity to drive down operational costs. Companies that are successful now, and will continue to be in the future, understand the role digitalisation plays in optimising efficiency and are transforming their businesses right now. The conditions for digitalising have never been better for successfully investing and making the transition. Besides the decreasing cost of many of the digital tools, there are a number of reasons companies need to digitalise now.

Digitalisation leads to connectivity. Connectivity leads to enhanced intelligence. With globally-connected factories, company leaders can have levels of transparency covering the entire operation, which have never before been possible. This vision includes better and real-time data on costs, resources and delays enabling better productivity and efficiency.

Technology has reached the integration point to facilitate digitalisation. Automation and robots take production out of human hands resulting in fewer errors. Sensors and software make data easier and cheaper to collect and analyse. This data helps companies keep their machines in better working order. Best of all, the prices on these tools are decreasing making them more accessible.

Big data can now guide companies to make better decisions when making global improvements. Software will be the key

selling point for machines when demonstrating how they solve customers' needs. However, people are a big barrier to getting higher productivity out of the technology. Workers need coding skills to program the machines. Companies need to train current workers and hire for the skills they can't train quickly.

Manufacturers may find that competitors are making the move to digitalisation. By waiting, they risk falling behind instead of gaining the advantage. That can cost in potential customers, and in attracting new employees. Plus, intelligence and technology continues to develop giving further big advantages and a wider gap between those that digitalise sooner and those that wait.

Research shows that digital laggards will be greatly affected by the digital transformation in just a few years. But, those that make the transition are already seeing the benefits. Specifically, Lantek has helped its customers optimise productivity and profitability, become more agile to deliver rapid solutions, minimise material waste, provide personalised services and to react more quickly to unforeseen circumstances.

But how do you know if your company is ready to digitalise? Companies that have made the transition share common characteristics that make them more likely to be successful:

Aspirational: the digital transition is a culture change with a need for new skills and a change in habits. Leadership needs to be front and centre championing the new vision and offering full support and motivation to get workers to buy-in to digitalisation.

Customer-Centric: every decision should consider the impact it has on customers. Faster production, enhanced customisation, personalised services and fewer delays are examples of what will make customers happy.

Innovative: new improvements and tools

are coming faster than ever. Manufacturers need to always be looking for ways to improve efficiency and productivity to maintain a lead over their competitors.

Data Driven: data is at the core of everything you will do in the digital world. Data needs to drive your decisions.

Collaborative: globally-connected factories open up opportunities for better collaboration. New points of view can spur innovations that wouldn't have been possible before. Connected tools (ERP, CRM, MES, CAD/CAM etc.) allow digital sharing of files that employees can access anywhere, including real time updates.

Continually Learning: as technology continues to improve, workers also need to



be continually learning. They will need to be able to learn new systems, adapt processes and keep up with new tools.

Agile: as new opportunities arise and competitors make sudden changes, company leaders need to be able to make quick decisions and react to those changes. Using the data will help them make better choices.

There is an opportunity to take the lead in digitalisation right now. By taking it, companies will have the advantage and avoid being overtaken by their competitors.

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MTC enhances 3D printing capability with UK's first HP Jet Fusion printer

The Manufacturing Technology Centre (MTC) will continue to drive the additive manufacturing revolution in the UK after it became the first centre in the country to install HP's latest ground-breaking 3D printer.

The Coventry-based centre has added the revolutionary new HP Jet Fusion 4200 to its extensive additive manufacturing armoury, which has been supplied by Europac 3D.

Recently crowned 'Innovation of the Year' at the inaugural 3D Printing Industry Awards in London, the printer will be housed in the MTC's National Centre for Additive Manufacturing, which recently agreed a partnership to be the benchmarking centre for the European Space Agency.

HP's new kit, described as 'a digital furnace of the next industrial revolution,' will transform 3D printing as it claims it can deliver components up to 10 times faster than current processes, improve print quality and do so at half the cost.

To showcase the speed, accuracy and quality of the HP Jet Fusion, the MTC and Europac 3D staged a successful industry open day on Thursday July 13, which attracted representatives from a number of high-profile organisations.

The machine will play a key role within the MTC and enable the innovation centre to further push the boundaries in this technology, as well as opening up new opportunities to promote its capability and usage across a range of industry sectors. The printer will be available to all companies interested in testing the technology and the capabilities of 3D printing.

Chris Ryall, operations manager, additive manufacturing at the MTC, says: "It's evident that the new HP Jet Fusion machines are set to revolutionise the 3D printing marketplace and bring real benefits to users. By housing one of the printers here at the National Centre, we are able to open the use of it to industry, allowing them to explore and test the latest technologies and see what benefits 3D printing may be able to offer their operations."

Europac 3D has increased its ability to raise awareness and knowledge of the capabilities of 3D printing by becoming the latest member of the MTC.



The Cheshire-based company is one of the UK's leading 3D printing, scanning and inspection businesses. Europac 3D has been appointed one of HP's Channel Partners for the sales and servicing of all of HP's 3D printing systems and accessories across the UK.

The company plans to play an active role in engaging with organisations to identify opportunities, ideas and share best practice in the world of 3D scanning and printing. It works across all sectors including motor, medical and engineering and has a proven 20-year record in 3D scanning, modelling and reverse engineering, as well as printing service and maintenance.

John Beckett, managing director of Europac 3D, says: "We could think of no better place to install the first machine than at the MTC, as it is at the forefront of manufacturing technology and provides an ideal location for organisations to see the machines and examine how they can be applied to reduce costs or improve production speeds."

Europac 3D, headquartered in state-of-the-art facilities in Cheshire, offers a

full spectrum of services from the supply of cutting-edge scanners, printers and accessories to installation, maintenance and training of staff in the usage of 3D hardware and software.

The Manufacturing Technology Centre (MTC) is inspiring British manufacturing globally by developing innovative manufacturing technologies and processes in partnership with industry, academia and other institutions. Founded in 2010, the MTC has some of the most advanced manufacturing equipment in the world, enabling it to provide a specialised environment for the development and demonstration of innovation to be used on an industrial scale. The MTC works collaboratively with companies of all sizes, from start-ups to global corporations in diverse industry sectors, including aerospace, marine, defence, construction as well as food and drink.

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A passion for quality, excellence and customer satisfaction

Northamptonshire-based precision engineering subcontractor G23 Engineering Ltd describes the PSL Datatrack production control system as "brilliant". The company believes that its investment in the system has been more than justified by underpinning the dramatic growth of the company over the last year, helping achieve ISO 9001 accreditation very smoothly and giving its customers fast and full component traceability and manufacturing history.

The family business, run by brothers Adam and Dan Green, was initially centred almost exclusively on the top-level motorsport and luxury automotive sectors. With many years' experience under their belts in precision turning and milling, the opportunity to expand the business using these acquired skills was very attractive.

They knew, however, that proper production control was of paramount importance for any transition and growth as the company's existing administration procedures would not be good enough.

"We knew simply recording and storing customer and production information on the company iPad would not be sufficient. We were already missing some jobs or sometimes not invoicing correctly. So, bearing in mind all the likely combinations of orders for different components, quantities and materials that an increased customer base was likely to bring, things had to change," explains Adam Green.

Another pertinent challenge was to acquire ISO 9001:2015 quality accreditation.

"As a company with a passion for quality, excellence and customer satisfaction, the credibility and status of gaining ISO accreditation was never in doubt," he adds.

As it turned out, it was the company's ISO consultant who suggested that PSL Datatrack production control software could be the solution for all their requirements, having already witnessed how other companies had benefited from it in their quest for ISO 9001.

Twelve months later and G23 Engineering Ltd now has many new customers on board from markets as diverse as aerospace, nautical, defence and the medical sectors to name but a few, in addition to its existing



automotive business. Using state-of-the-art machine tools, the company offers 3-and 4-axis milling on its vertical machining centres, complemented by 2- and 3-axis turning with live tooling to produce complex turned and milled components. Coupled with sophisticated CAD/CAM systems, the company can now take on a full range of prototypes, test pieces and full production contracts.

G23 Engineering Ltd now runs its entire business using the PSL Datatrack system. Having quickly gained ISO 9001:2015 accreditation, the company now has a system that can recall full documentation of every job for every customer instantly and ensure complete manufacturing traceability. The aim is always to quote for work within 24 hours and PSL Datatrack is enabling them to fulfil this pledge.

"Anything the inspector asked for, we could access immediately through PSL Datatrack. We can call up historic information quickly and quote accurately with consideration for variable stock holding, materials and manufacturing quantities in full knowledge that the quotations will be accurate and not over or under priced," says Adam Green.

Having already invested in a variety of PSL Datatrack modules from quotations to invoicing with sales and purchase order processing, component and materials stocks

together with gauge calibration the company can look to the future in a considered way in the knowledge that the PSL Datatrack investment can be extended exactly when needed and with minimum fuss.

Adam Green reflects positively on the decision to invest in PSL Datatrack: "It is the most flexible and fit for purpose production control system on the market. Having compared it to others, which left us cold, PSL Datatrack was focused on exactly what we needed: a simple, flexible system to which we can add extra modules and user licences as our plans for further expansion come to fruition. You get what you pay for. We invested wisely and the payback will be very quick."

Established in 2010, G23 Engineering Ltd has had continued success ever since, firstly in automotive and now in the contract engineering market. Its engineering capabilities in producing both simple and complex parts in a variety of batch sizes are now much more widely utilised and PSL Datatrack has added the stability and the credibility factor to support the company's continuing growth and plans for the future.

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New 3D printer can become a complete process chain

Thanks to an ingenious interchangeable cylinder concept and an industry-ready periphery, the new TruPrint 3000 3D printer from laser and laser system manufacturer TRUMPF is ideal for the large-scale production of complex metal parts up to 300 mm in diameter and 400 mm in height. When enhanced by complementary process stations, this new addition can also become a highly effective 3D printing cell.

This medium format machine is based on the laser metal fusion (LMF) technique, in which the laser melts metallic powder, layer by layer, in a production bed to produce parts. LMF is particularly suited to the cost-effective manufacture of geometrically complex and custom parts. Many sectors will benefit from this introduction, from dental and medical engineering to automotive and even jewellery manufacture.

Depending on the part in question, it may be made from any weldable material such as steel, nickel-based alloys, titanium or aluminium in powder form. Since the TruPrint 3000 is equipped with two supply cylinders, up to 75 litres of powder are available for each job, which is around two

and half times the construction volume. This is sufficient powder to complete an entire manufacturing process without having to stop for refilling.

Even if the powder were to run low, the ingenious tool change cylinder then kicks in. The TruPrint 3000 is designed so that the supply and overflow cylinders can be changed without interrupting the manufacturing process. This reduces downtime and increases the 3D printer's productivity.

To ensure efficient powder management an automated sieve station is available with the TruPrint 3000 that refines several hundred kilograms of powder per hour to ensure consistent quality. Grain size, grain-size distribution and flowability are all factored in to determine the laser output and process speed that will maximise powder performance. Before the powder is delivered, TRUMPF performs an internal check to ensure it meets the customer's quality requirements.

The TruPrint 3000 can also be specified as a complete process chain for additive manufacturing with the addition of an



external unpacking station for parts to be cleaned and detached from the substrate. Thanks to the station's safety gloves and sight protection, users don't come into direct contact with the powder during unpacking and cleaning.

Meanwhile, the TruTops Print with Siemens NX 3D design and production software is the first comprehensive software solution with a standardised user interface across systems. Industry 4.0 solutions can also be brought together for additive manufacturing via TRUMPF TruConnect

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Laser Lines becomes UK reseller for Desktop Metal

Laser Lines, a total solutions provider of 3D printers, 3D scanners and laser equipment, has announced that it has become a UK reseller of Desktop Metal's range of metal 3D printing systems.

Mark Tyrantia, sales director at Laser Lines, says: "We are thrilled to have signed Desktop Metal as a supplier. It is a dynamic company to work with as it is rewriting the rule book in terms of possibilities for metal 3D printing. For those that are producing parts or are prototyping, its machines are fast, great value and use a wide range of materials. Its printing process of Bound Metal Deposition (BMD) is similar to Stratasys' FDM technology, which we have been selling for over 20 years, so it is a technology that we are familiar with. Within the metal printing space, it offers exciting, new opportunities for our market."

Laser Lines will be selling and supporting the Studio series when it becomes available at the end of 2017, and the Production series when it is released in 2018. Mark Tyrantia continues: "The Desktop Metal series offers amazing functionality and great value. Companies can now have a complete solution of 3D printing machine and sintering unit that can be used with a huge variety of materials. The Desktop Metal Studio system is perfect for engineers looking for an in-house unit suitable for prototyping and creating sample parts."

The system has an extremely compact footprint and a build area of 300 x 200 x 200 mm. It can print 16 cm³/hr and has a layer height



of 50 µm. With dual, quick-release print heads and hot swappable cartridges, it has an automated sintering furnace.

Laser Lines has over 20 years' experience in the 3D printing and scanning sector, so is often the first point of call for customers who want to find out more about the realities of installing a system for manufacturing, rapid prototyping or reverse engineering. Customers wanting to find out more about the Desktop Metal range of products available from Laser Lines should contact:

Laser Lines Ltd
Tel: 01295 672599
Email: 3dworld@laserlines.co.uk
www.3dprinting.co.uk

Bakery feeds 400 percent turnover growth with 123insight

In 2004, Image On Food Ltd needed to move away from its collection of Excel spreadsheets and, after dismissing bakery-specific software as too inflexible, selected 123insight. The system was implemented at the same time as the BRC quality standard and, after going live, lead time accuracy was improved from two weeks to three days, eradicating stock level errors and reducing low shelf life stock by five percent.

Based in Market Drayton, Shropshire, Image On Food Ltd initially took 10 licences, after the series of Excel spreadsheets failed to provide good traceability, stock information and accurate lead time predictions, almost costing the company two major clients. At the time, managing director Tim Hopcroft evaluated a production system specific to the bakery industry, but found that it was not flexible enough for their business.

Since then, and despite a double-dip recession the company has grown significantly, although still subscribes to the same 10 licences as the number of admin staff has not needed to be increased.

Tim Hopcroft says: "Last year (2016) was just shy of £1.4m. I would imagine our turnover has quadrupled since we implemented in 2004. We have the same administration staff but the job roles have become more defined."



Although turnover has increased dramatically stock has increased by just 20 percent. Tim Hopcroft cites that in addition to only buying what the company needs, another reason for this is down to visibility of slower moving items: "If we have 20,000 pieces of ribbon that's not been used for a while we can choose to put it on a line instead of buying others."

The company has to comply with the BRC (British Retail Consortium) quality standard, but since implementing 123insight audits have never been a problem.

"We just had an audit last week. We were given four hours to do a full forward and backward trace on an item. We did it in 20

minutes, and that was taking our time as well."

123insight's monthly subscription model means that Image On Food always have access to the latest version without any software upgrade costs. A recent update included a new 'implode' feature, which Tim Hopcroft found extremely useful:

"The implode trace is just phenomenal. We can literally select a batch of dried egg whites that will last us three months and will be used in 300,000 products, and we now know each batch of gingerbread men that this batch of egg whites has gone into."

Tracking of customer conversations was something that Image On Food had previously stored in Outlook contact and notes fields, but a subsequent upgrade to 123 Insight's CRM+ means that everything is now in one place.

Gemma Williams, senior product manager says: "What that has meant for us is definitely speed. When raising quotes, it links directly into the customer contact, which automatically sets an action to follow up on the quote, and also provides us with any previous notes. We can quickly download a list of addresses for online mailshots or postal addresses. It's also very useful as it's no longer just stored in someone's head. That was the big problem before. Someone might be speaking to one member of staff one day and then speak to someone else a couple of days later who wouldn't know about the previous conversation. Now we store all notes about



previous conversations on CRM+ and anyone is able to access them."

The company has in-house SQL expertise and has expanded on 123insight's functionality by drawing live information from its databases along with its own and then reshaping it in Excel. This has helped them reach other targets, such as reducing the number of tools on the shop floor.

Tim Hopcroft adds: "Our works order list tool numbers, and we can run a query to list all of the tools required for the coming week. So whereas before we might have 200 tools in the bakery, now we only have what we need for the week, with the rest of the tools stored off the shop floor. As a result, the bakery now has more space. It was part of the full picture of clearing the clutter out of the production areas, cataloguing tools and only issuing what was needed for the day or week."

Gemma Williams adds that the possibility for human error has been reduced, as not only are there less tools on the shop floor but also works orders have a picture of the finished product, adding further clarity.

The company has revamped its previous bonus scheme, as a result of staff feedback, to be performance-based, and the Shop Floor Data Control provides all of the raw information required to calculate this.

Gemma Williams continues: "Staff felt frustrated that some people were working 150 percent and others at only 50 percent, yet getting the same rate of pay. In order to get the decorating bonus, they have to be able to decorate over 50 percent of the lines produced in the quarter and to be over the target times allowed for decorating that product. That's ensuring that everyone gets trained on every single line, everybody has a chance to decorate every line and expand their decorating skills base, and it also answers the staff issue of performance-related pay."

On Food receives a regular visit from 123insight Customer Care staff and this has proven extremely useful over time, with each visit helping them to identify new ways to use the software. Gemma Williams comments: "When they come in they see how we use the software and will often chip in to say 'did you know you can do this?'. It's just little things but it makes such a big difference. It's great being able to show them something rather than just via screenshots or over the phone."

Although the company has subscribed to 123insight for well over a decade, Tim Hopcroft still feels that he gets value for money over the traditional approach of purchasing a system: "When we first took the system on, the subscription model was good because we were getting a lot for our money but not outlaying much in one go. I think at the time 123insight was probably groundbreaking but now subscriptions are everywhere. It's the way of the world. Even if you buy the latest software, assuming you can still buy it, you still have to buy updates, support and everything else. You have to value that monthly payment and ask if it's adding value to the business. You haven't got to justify £35,000. You've just got to justify it month to month."

Since implementing 123insight, Image On Food has recommended the system to several other companies in the food



industry, with Tim Hopcroft believing that the system has helped to feed their growth over the years.

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Subcontractor makes picture perfect parts with hyperMILL

Previously working as an engineer in the F1 industry, it was the unsociable and unpredictable working routines that led Allan Carabine to set up his own machine shop in 2011. Working in the F1 sector taught the new business owner two valuable lessons; the first was to start with a 5-axis machining centre and the second was to implement leading CAM software to drive the machine.

For the Milton Keynes Company, this marked the arrival of a Hurco 5-axis VM10U and hyperMILL CAM software from OPEN MIND Technologies as the company's very first acquisitions. Commenting upon this selection that was to base the foundation of the company, Allan Carabine says: "Everyone can do 3-axis work, so when I started; I wanted to start with a 5-axis machine. The next thing I had to get was hyperMILL CAM software. I have worked for F1 teams as well as some of the most prestigious subcontractors in the F1 supply chain, all previous employers in the industry used hyperMILL as it is the only viable package for companies serious about 5-axis machining. I bought hyperMILL on day one of starting the business. OPEN MIND confirmed the post-processors were

compatible with the VM10U and from that point, the CNC controller became irrelevant as everything is modelled and programmed in hyperMILL."

The Buckinghamshire business started by machining steel mount components for a panoramic camera company, this soon evolved into 5-axis F1 work and six years later the small business has expanded to machining a complete range of rail, cryogenics and motorsport parts. Whilst the four employee business manufactures production runs for the defence industry, the average batch size ranges from 10 to 20 parts, machining materials from aluminium, stainless, plastic and nylon composites. Of course, to take on the additional work, MK Precision required more staff and machine tools. The acquisition trail brought the subsequent arrival of two 3-axis Hurco VM30's, a larger 5-axis VMX30U, a TM8i turning centre and a CMM for ensuring the conformity of F1 components. However, 40 percent of the company's work remains prototype business and this is where hyperMILL really benefits the company.

Allan Carabine says: "The programming time will be anything from 20 to 50 percent of the overall time spent on each job, something that obviously varies with the complexity of individual jobs. With prototype parts requiring up to four hours of machining, the programming time can be anything from 30 minutes to three hours. One of the main benefits of hyperMILL is the modelling and collision checking of the parts."

The growing workload for the small subcontract business recently noted an additional seat of hyperMILL arriving at MK Precision. The first seat has delivered remarkably short programming times; a necessity for a machine shop manufacturing low quantity, highly complex parts. The second seat is now underpinning this strategy of fast turnaround of complicated 5-axis parts.

Shop floor benefits with hyperMILL

From a cost perspective, hyperMILL has



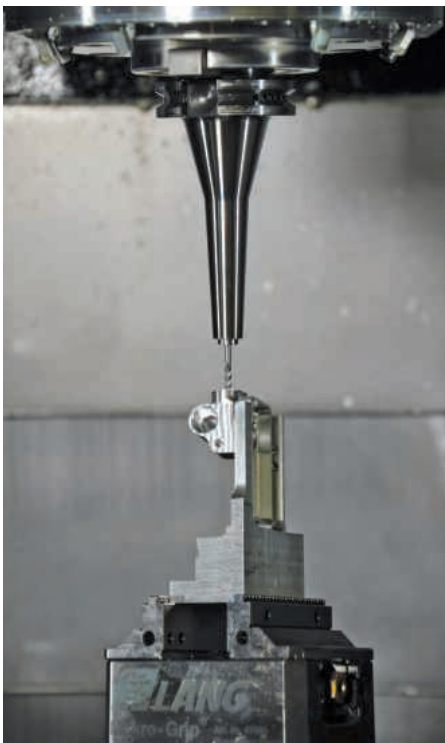
reduced tooling consumption by almost 80 percent and slashed cycle times by over 50 percent. These savings are credit to continually evolving strategies that are being developed by OPEN MIND Technologies. Some of the new strategies that are now being applied were unfamiliar to the company when it bought its first seat some 6 years ago. The staggering statistics are partially credit to innovative trochoidal milling strategies, something that is also generating a noticeable reduction on spindle load at MK Precision.

Another strategy that is prolonging tool life and improving consistency and process reliability for unmanned machining is the 5-axis optimised rest material machining strategy. The new cycle generates high speed cutting toolpaths for rest material machining based on the preceding roughing operation. It offers the ability to use shorter tools with improved stability for machining excess material from cavities and hard to reach areas.

Allan Carrabine says: "This feature has given us more confidence when machining parts with cavities. Previously, we would order extra tools in preparation for tool breakages in cavities, but the 5-axis optimised rest material strategy has given us confidence in the process, the cutting tool and the ability to run unmanned machining where necessary."

With customers that frequently require engraved components for traceability, MK Precision is making great use of the 5-axis contour milling strategy.

Allan Carabine continues: "There are certainly projects that we would never have won without the 5-axis contour milling strategy. It enables us to engrave parts on



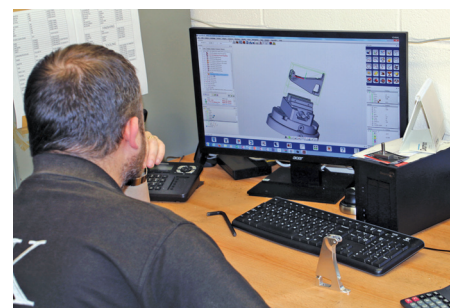
irregular and round parts. Easy to program, the strategy keeps the cutting tools perpendicular to the component face to generate simple and precise part marking. This has been a huge benefit when we have needed to engrave batches of parts with individual part numbers. Even when doing this, hyperMILL has a sequential feature that automatically changes the part number on each component."



Not just a powerful 5-axis package
MK Precision has a number of components that are turned parts, that often require second operation machining on one of the company's 5-axis Hurco machines. Referring to this, Allan Carabine says: "hyperMILL accommodates all our turning requirements and the multi-axis shape-offset module has the ability to trim tool-paths automatically to in-process stock, thereby saving manual tool edit procedures. This utility covers stock model generation where we can easily transfer the stock model to our 3 or 5-axis machines. This feature streamlines the transfer of parts from one machine to another whilst saving considerable programming times. It also reduces the machining times as it intuitively recognises what stock has already been removed."

In addition to the powerful hyperMILL CAM package, MK Precision is making good use of hyperCAD-S.

Allan Carabine concludes: "Whilst hyperMILL enables us to model and program parts extremely quickly, some customers, particularly in the rail industry only supply physical 2D drawings and not common electronic formats such as STEP, IGES, DXF and STL files. Using hyperCAD-S,



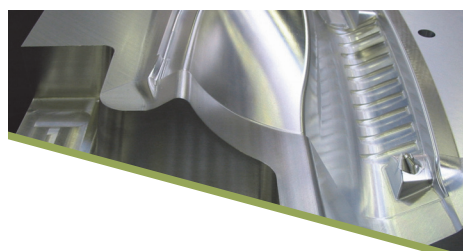
we can quickly generate component models from 2D drawings and these are rapidly expedited to create CAM programs. Additionally, we can accept customers' electronic files, drop them into hyperCAD-S, manipulate and edit the files where necessary and then generate part programs. Overall, OPEN MIND has delivered huge savings in programming times, shop floor production, tool life and it has also streamlined our processes to improve lead-times. I don't know how our business would survive without hyperMILL."

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vero
Software

Full steam ahead with Edgecam

Edgecam is helping a "toys for boys" manufacturer offer an important new service for model-making companies and private enthusiasts, and all within a few months of installing the software.

17d Miniatures produces a range of scaled working models of locomotives, carriages and wagons for three miniature railway gauge systems: 5", 7.1/4" and 10.1/4". The locomotives for the 5" gauge are to a scale of one-twelfth, at around six feet long, rising to approximately 12 feet for the 10.1/4" gauge. All the trains are sit-on, with enthusiasts actually being able to get inside some of the larger ones.

The family-run business is based in 2,500 sq ft premises at a converted mill near Matlock in the Derbyshire Peak District. Partner Tristan Dengate says customers range from private collectors through to commercial operations.

Now, after switching to Edgecam in early 2017, the company is looking to apply the techniques it uses for producing its railway-related models, to manufacture components for model cars, boats, lorries and aircraft. This will be a natural progression for the business, as it already offers a general machining subcontract service for other companies.

"Currently around 60 percent of our time is spent on machining components for our own products, with 40 percent producing items for other companies," says Tristan Dengate.

Edgecam has been the springboard for 17d Miniatures that promotes itself as the 'go to' company for individual enthusiasts wanting machined parts.

"A large number of hobbyists have spent 20 or 30 years making working steam engines in their sheds and are now finding that time is against them as they're getting older. So now they're looking for as many components as possible to be machined for them and Edgecam has given us the



opportunity to say - yes, we can machine that for you at a sensible cost," adds Tristan Dengate.

Thanks to Edgecam, 17d Miniatures is also starting to change how it manufactures certain parts. He says they use a lot of resin cast units for their bearing carriers: "These aren't as precise as they could be, but because Edgecam is so quick and accurate we can switch to machining them from solid block.

"The ability to move away from castings is really going to change how we work. The market is used to having castings for many components, but we're now starting to turn that on its head by showing that they don't actually need castings. The products can be machined from solid block which is far quicker, even though there's more material to remove."

Where specifically required, Edgecam does machine cast iron, both in round bar and block form.

Tristan Dengate says that the software's powerful game-changing Waveform Roughing Strategy is one reason it is so fast: "We were able to triple the feed rates, and have the cutter going in considerably deeper than we could with traditional roughing."

Amongst the mild steel and aluminium components milled with Edgecam are wheels, profiles, counter-balance weights, working cylinder block, valve gear components, chimney fitments and brake calipers. Everything it mills goes through Edgecam and is cut on their Bridgeport VMC 412x 3-axis machine tool. Around 80 percent of the components need to be high precision.

"For instance, when we're machining valve gear and cylinders it's crucial they're absolutely perfect, and we know that with Edgecam's NC code they always will be," continues Tristan Dengate.

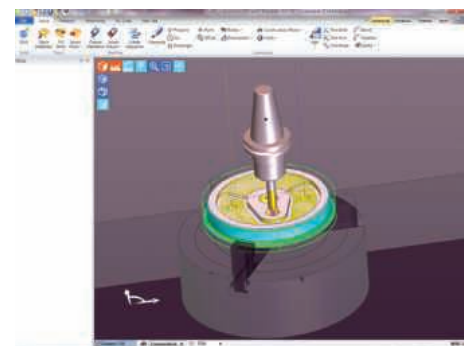
The company began its CNC journey several years ago and initially programmed the Bridgeport both manually and with a lightweight CAM software more geared towards hobbyists using bench-top hobby mills.

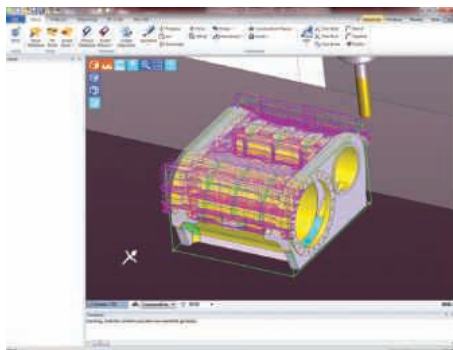
"I was having to work out the best way of machining, and then generating perhaps ten different cycles to achieve what I'm now achieving with one cycle in Edgecam,"

Explains Tristan Dengate. However, as he points out, he is not a time-served machinist, nor has he had any formal training on Edgecam, but quickly began to successfully program parts, and even set up a post processor.

"I've come a long way in a very short time and am able to produce reasonably complex parts swiftly and accurately, and am looking to produce even more complex components in future."

All of which stands the company in good stead for its plans to increase subcontract model-making.





"Edgecam gives the ability to produce working scale models, rather than just mock-ups. Many companies would benefit from having proper working models as a display piece or technical exercise. For example, we've produced a wheel and chassis bogey assembly for a company providing test rigs for testing full-size assemblies, and they needed a working model for exhibitions around the world."

He says that another benefit of Edgecam is that it enables them to give accurate costings to customers: "Being able to get an actual cycle from Edgecam means our estimates are as accurate as possible."

As a considerable amount of work is carried out in a chuck mounted on the machine tool bed, he says it is simple to load a customer's 3D CAD file and select the appropriate fixture from Edgecam's library.

"The facility to simply hit a button to put a



10" chuck on the virtual machine, for instance, is invaluable for tool collision detection giving greater confidence in the code, enabling me, with certain work, to load the material and hit go, without dry-running. Also, the standard stock fit option covers around 90 percent of what we're doing, so, again, it all saves time. It's also easy working with datums as we can reference it anyway we want to with just two or three clicks."

In conclusion Tristan Dengate says that it is easy to access the appropriate functionality in Edgecam to carry out any type of operation: "Once I've selected an operation it's simple to go back and edit it. I decided to purchase Edgecam after a one-month trial earlier this year and it's quickly become an integral part of our manufacturing process."

Headquartered in England, Vero Software designs, develops, and supplies CAD/CAM/CAE software radically

enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market. The company's world-renowned brands include Alphacam, Cabinet Vision, Edgecam, Machining STRATEGIST, PEPS, Radan, SMIRT, SURFCAM, WorkNC and VISI, along with the production control MRP system Javelin. Despite the diversity of application, these solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations in which they are deployed.

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VERICUT's show of Force at Kyocera SGS Precision Tools event

The developer of VERICUT CNC simulation, verification and optimisation software, CGTech officially launched its 'physics-based' CNC program optimisation module, VERICUT Force, in the UK with a series of nationwide seminars.

Held on 28th June, at KYOCERA SGS Precision Tools EU Tech Hub, Wokingham, the Force Roadshow half-day seminar was attended by over 20 of the leading aerospace, motorsport and medical engineering companies. Additional seminars were held at the Advanced Forming Research Centre, Scotland; Nikken, Rotherham, and the Manufacturing Technology Centre (MTC), Coventry.

As part of an ongoing technical partnership between the two companies, the seminar formed one of Kyocera SGS's 'Lunch and Launch' events, which have been developed to highlight potential productivity and efficiency improvements for existing customers, as well as any new businesses that might gain a competitive edge in the various global markets. Presentations of the virtual capability of Force were backed-up by actual cutting tests using the Grob V350 5-axis machining centre in the cutting tool company's technical centre.

Force is a software module within VERICUT that uses a physics-based optimisation method to determine the maximum reliable feed rate for a given cutting condition based on four factors:

maximum chip thickness, and maximum allowable feed rate. It calculates ideal feed rates by analysing tool geometry and parameters, material properties of the stock and cutting tool, detailed cutting tool edge geometry, and VERICUT cut-by-cut contact conditions.

Force excels in difficult to machine materials, and especially complex multi-axis cuts such as 5-axis flank milling. CGTech managing director, Tony Shrewsbury, says: "Force is founded on the basics, it is easy to set up and really easy to use. After materials have been characterised they can also be applied to a broad range of cutters and machines in other NC machining operation."



Initial users of this technology are already seeing productivity improvements of up to 50 percent. Each seminar will incorporate live software demonstrations and presentations to shine the spotlight on the features and benefits of Force. Tony Shrewsbury continues: "With these seminars we really wanted to demonstrate exactly



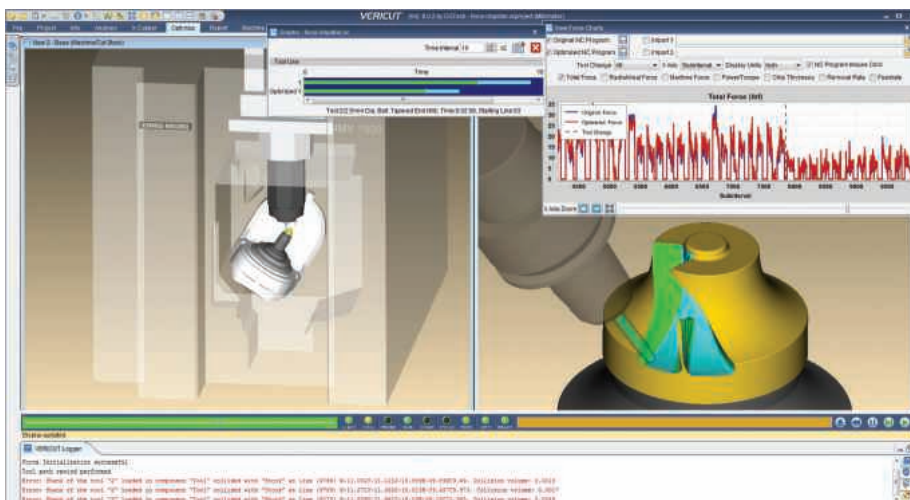
what Force can do and the benefits of using it, including reduced development time, shorter cycle times, less process variation, longer machine life and improved part quality. It can also prevent tool breakage due to deflection."

Tony Shrewsbury concludes: "Like Kyocera SGS, we provide the opportunity for manufacturing companies to improve their productivity and effectiveness. Both companies share customers that form the leading technical edge in their industry sectors, which includes aerospace, motorsport, marine, oil and gas, medical, power generation, and general precision engineering. Our technical partnership allows us to work together, for mutual benefits to both partners. And, demonstrating Force at the Lunch and Launch even has certainly provoked positive feedback from the seminar attendees."

Headquartered in Irvine, California, CGTech specialises in numerical control (NC/CNC) simulation, verification, optimisation, and analysis software technology for manufacturing. CGTech was founded in 1988. Since that time, its main software product, VERICUT, has become the industry standard. With offices worldwide, VERICUT software is used by companies of all sizes, universities/trade schools, and government agencies.

CGTech has partnerships with all major CAD/CAM companies. As a result, there is a VERICUT interface to all major CAM systems. CGTech understands the processes surrounding VERICUT and knows how to make it fit smoothly into your methods. CGTech has partnerships with many major machine tool builders to facilitate all aspects of VERICUT implementation.

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CIMdata ranks Mastercam first for installed seats

Mastercam is the world's most widely-used CAM software for the 23rd straight year, according to the latest analysis by CIMdata, Inc. With over 236,000 installed seats worldwide, Mastercam has almost twice the installed base of the closest competitor.

CNC software president, Meghan West says: "CNC Software is grateful to our constantly expanding and highly experienced global user base for their continued support. It's the feedback and input from the worldwide manufacturing community that has helped Mastercam stay at the forefront of manufacturing technology and productivity today,"

"The large community of qualified Mastercam programmers presents a number of opportunities. As a manufacturer, if you're looking to expand, you can find experienced talent, and as a programmer, you can always find a shop that uses Mastercam."

CIMdata also recognised Mastercam's global support network as the largest in the CAM world.

Meghan West says: "Our Mastercam

resellers continue to provide manufacturers with expert training, on-site support, and consulting to ensure production goals and deadlines are met.

"And with almost 25 percent of the educational market, CNC Software continues to demonstrate its commitment to the future of our industry, as well as the next generation of manufacturing professionals. We continue our commitment to all levels of learning, from secondary education and community programs to technical schools and universities. We have worked with our global support network to develop programs and tools that introduce students to the world of manufacturing at every age, and that teach the programming skills necessary for meaningful employment."

Mastercam gives your shop a powerful and integrated foundation of shop-tested CAD tools. From wireframe and surfacing to solid modelling, Mastercam ensures that you're ready for any job. Mastercam delivers: Full 3D live wireframe modelling; Powerful surface modelling and editing;



Solid modelling; Broad range of translators allowing you to open any CAD file; Associative dimensioning, analysis, and much more.

4D Engineering is dedicated to providing state-of-the-art software tools for CAD/CAM manufacturing markets. It has been the UK Mastercam distributor since 1990, and provides sales, training and bespoke manufacturing solutions based around the Mastercam range of products.

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Huron chooses ModuleWorks collision avoidance technology

Huron has chosen ModuleWorks collision avoidance software for its new PreciPROTECT collision avoidance system. The ModuleWorks components run directly on the Siemens Sinumerik 840D SL CNC control and enable Huron to provide real-time collision avoidance for its new K3X8-Five and 0KX50L 5-axis vertical machines.

The ModuleWorks software takes the real axis positions, machine geometries and workpiece position and uses the same motion data as the real servos to provide a fully integrated and visually realistic simulation of the machine kinematics, tools, jaws, clamps and fixtures as well as the material removal process. Collision detection and avoidance is available in both auto and jog modes using look-ahead motion data. If a collision is detected, the machining process is stopped before an actual collision occurs to prevent expensive machine damage and downtime.

Bernard Echevard, general manager at Huron, explains: "The ModuleWorks software enables us to offer a sophisticated, state-of-the-art collision avoidance system



that protects our new 5-axis machines from expensive damage. Our customers benefit from a more efficient and cost-effective production process with reduced risk of downtime and stock wastage."

Mark Foti, product manager for the ModuleWorks collision avoidance system, says: "More and more machine manufacturers are recognising the need to offer real-time collision avoidance systems for their milling and turning machines. It's great to see that ModuleWorks components are the solution of choice for industry-leading multi-axis machines."

ModuleWorks is a software component provider for the CAD/CAM industry. ModuleWorks' expertise in toolpath

creation and simulation is recognised throughout the CAM industry and its software components and development services are used by the majority of the leading CAM vendors for sophisticated industry focused solutions across diverse business sectors. ModuleWorks 5-axis and simulation software has been used in the manufacture of complex parts for over a decade and they have many users across the global CAD/CAM industry.

Huron Graffenstaden produces a wide range of milling and turning solutions dedicated to machining by chip-removal. Recent decades have been marked by the development and production of innovative machine tools which have forged the company's reputation after having established the name 100 years ago with the first universal 5-axis head.

Moduleworks GmbH
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www.moduleworks.com

FARO Introduces next generation FaroArm

Performance standard for manufacturing inspection and alignment

FARO, the trusted source for 3D measurement and imaging solutions for factory metrology, product design, construction BIM/CIM, public safety-forensics and 3D machine vision applications, has introduced the new FARO QuantumS FaroArm®. This introduction extends FARO leadership in value and performance in the manufacturing inspection process through best in class performance and durability, enhanced ergonomics and extreme portability.

Performance and durability

The QuantumS is certified to ISO 10360 -12:2016, the most rigorous international measurement quality standard in existence. This global standard, unlike the various regional standards such as VDI/VDE 2617, establishes the consistent, critical testing procedures that enable objective performance comparisons across any and all articulated arm coordinate measuring devices. Also, the QuantumS sets a new standard for ruggedness as it tests to the International Electrical Commission (IEC 60068 -2) standards for shock, vibration and temperature stress relief. Next, with the addition of the FAROBlu™ Laser Line Probe HD, the QuantumS continues the FARO tradition of delivering maximum measurement consistency for both

direct-to-parts contact and non-contact requirements in every working environment. Finally, FARO extends its leadership in improving end user productivity by enabling users to capture more, richer detail faster than any other comparable product on the market.

Usability

The advanced man-machine interface and enhanced ergonomics make the FARO QuantumS a virtual extension of the human arm and enables up to 15 percent less effort and fatigue for the operator with direct, contact only units. This dramatic increase in both comfort and portability increases operator productivity by facilitating continuous use over extended periods during the workday.

Portability

QuantumS advances the concept of true portability and ensures additional floor reach by up to 40 percent. Advanced wireless capability ensures that the reliability of cable-free scanning and probing is comparable to scanning and probing with a cable attachment. Furthermore, the availability of dual, hot swappable batteries supports continuous operation anywhere on the factory floor without the need for external power.

Simon Raab, Ph.D., FARO's president and CEO, says: "FARO takes great pride in its market leadership position in delivering a FaroArm that is 25 percent more accurate than any FaroArm to date, is our toughest FaroArm ever and adheres to the most exacting global quality standards. We continue to elevate the value/performance standard for large scale measurement applications by combining leading edge usability, best in class performance and value driven pricing. Next generation user interaction, enhanced portability and Super 6DoF compatibility significantly improves the end user experience from both a personal comfort and productivity standpoint."

FARO is a trusted source for 3D measurement, imaging and realisation technology. The company develops and markets computer-aided measurement and imaging devices and software for the following vertical markets: Factory Metrology, high-precision 3D measurement,



imaging and comparison of parts and complex structures within production and quality assurance processes; Construction BIM-CIM, 3D capture of as-built construction projects and factories to document complex structures and perform quality control, planning and preservation; Public Safety Forensics, capture and analysis of on-site real world data to investigate crash, crime and fire, plan security activities and provide virtual reality training for public safety personnel; Product Design, capture detailed and precise 3D data from existing products permitting CAD analysis and redesign, after market design and legacy part replication; 3D Machine Vision, 3D vision for both control and measurement to the manufacturing floor through 3D sensors and custom solutions

FARO's global headquarters is located in Lake Mary, Florida. The company also has a technology centre and manufacturing facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of our FARO Laser Tracker™ and FARO Cobalt Array Imager product lines. The company's European regional headquarters is located in Stuttgart, Germany and its Asia-Pacific regional headquarters is located in Singapore. FARO has other offices in the United States, Canada, Mexico, Brazil, Germany, the United Kingdom, France, Spain, Italy, Poland, Turkey, the Netherlands, Switzerland, India, China, Malaysia, Thailand, South Korea, Japan, and Australia.

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Hexagon releases PC-DMIS 2017 R2

Hexagon Manufacturing Intelligence has launched PC-DMIS 2017 R2, the latest edition of the world's most popular measurement software. This is the second of two major releases scheduled for PC-DMIS in 2017, with continued service pack updates to ensure maximum reliability of the platform.

PC-DMIS 2017 R2 introduces Slideshow for INSPECT software, allowing users to create unlimited customisable layouts with inspection results populated during measurement. INSPECT software was first introduced with PC-DMIS 2017 R1 in January 2017 as a simple front-end for PC-DMIS measurement routines. The optional Slideshow tab, additional licence required, can display multiple slides of dimensional and informational labels whenever users execute a measurement routine. The native mesh resolution is improved from import to visualisation. PC-DMIS 2017 R2 makes it easier to apply a colour map to the mesh data object and create annotation points, align mesh data objects to the CAD model or align a mesh to

another mesh object. The Vision Live View now displays which features have already been programmed without the need to swap to CAD view, and also offers an integrated focus graph.

PC-DMIS 2017 R2 improves the efficiency of vision features by reducing rechecks caused by contamination. The outlier filter has been improved to better handle noise on small arc segments and at the end points of a line, requiring less manual analysis and rechecks from the programmer. New AICON Optical Scanner support allows for seamless automation of sensor acquisition and PC-DMIS measurement and analysis. CAM models from Vero Software's VISI can now be directly imported into PC-DMIS, complete with identified 'control points' that can be automatically converted to measurements. CAD file import is now multi-processor aware, providing faster importing and better experience overall. Also, a new virtual machine dialogue is now organised in the tree view arrangement for easier machine selection, with an added Table Only category so programming can



be completed even when the exact machine is not known. And a new CAD toolbar puts all the tools needed for CAD import and GD&T selection in one place.

PC-DMIS 2017 R2 is available to download immediately. More information is available through local Hexagon commercial operations and dealers.

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SICK's OD1000 goes the extra distance for precision

The SICK OD1000 displacement sensor sets new standards in high-precision distance measurement with its extremely long 1 m scanning range and a resolution down to 450 µm. Developed by SICK to achieve high consistency and linearity in measurement results on many different surfaces and colours, even at high production speeds, the OD1000 goes the extra distance for performance and value.

Many automated industrial processes such as the metal forming and automotive industries, depend on such precision measurements, for example for on-belt positioning, metal sheet edge counting and diameter checks on spools or coils for unwinding tasks. The OD1000 offers new levels of precision and range at an affordable mid-price point. With intelligent measurement filters incorporated in the firmware, objects with virtually any surface or colour of object can be reliably measured.

Neil Sandhu, SICK UK's national product manager for measurement systems, says: "The OD1000 delivers excellent results over a wider distance range than has ever been

achievable previously. The OD1000 simplifies machine integration and is easy to install and commission.

"Users welcome the fact that it is a compact, low-cost, single unit device that's easy to install. It is very easy to mount and set up, with an on-board OLED display. Using the SICK SOPAS parameterisation software, with its innovative new menu structure, allows easy distance visualisation and teach-in."

The OD1000 incorporates SICK proven IO-Link communications to enable set process parameters to be uploaded and saved, making commissioning and device replacement swift and error-free. IO-Link also provides opportunities for enhanced data handling and diagnostics.

A choice of outputs is available including switchable, scalable analogue (MA/V) and push-pull. The OD1000 represents good value for its performance and capabilities as part of the SICK OD range of laser scanners, which represent a comprehensive selection of performance and value to suit measurement applications.



SICK (UK) Ltd is based in St Albans, Hertfordshire and has been the UK subsidiary of SICK AG (Germany) since 1973. It has a wide network of sales engineers, service engineers, distributors and resellers throughout the UK and Ireland. As an experienced system partner for many major projects, SICK not only offers a wide range of leading edge products but also a comprehensive package of vital know-how, service and support.

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Infosys and Renishaw announce partnership

Infosys, the world-leading engineering and IT services company and Renishaw, a world leader in metrology and additive manufacturing technologies, have announced a strategic partnership to offer an end-to-end product development service using metal additive manufacturing (AM) technology.

The two companies are combining their engineering expertise and global resources to help customers accelerate their deployment of AM, also known as 3D printing, for volume production of end-use metal components.

Infosys will apply its efficient engineering processes and design for AM knowledge to manage product development projects from concept through to launch. Renishaw will support Infosys through its global network of Additive Manufacturing Solutions Centres, which provide access to the latest Renishaw metal AM technology, backed by application engineering expertise, post-processing capability, and metrology.

While additive manufacturing is changing the way that components are made, its bigger impact is on the design of products themselves. AM enables products that are lighter and more efficient in their use of resources, that facilitate exceptional heat transfer, that are integrated with fewer joints for greater reliability or that are customised to adapt perfectly to a specific application. These gains in product capability are transforming AM into a mainstream manufacturing technology, used in series production of high performance parts for aerospace, medical, automotive, oil & gas, mould & die and consumer products.

"Additive manufacturing enables us to design and make innovative products with spectacular gains in performance and efficiency," says Sudip Singh, global head, Engineering Service at Infosys Ltd. "Infosys has developed a rich knowledge base of AM design best practices, coupled with powerful design tools to analyse and optimise product designs, so that we can take full advantage of the flexibility that AM offers."

Infosys provides end-to-end product development and sustenance services to clients of multiple industry segments across the globe. These services include concept/preliminary/detailed design, design, analysis, optimisation, design for manufacturing and product costing. Infosys is able to bring its cross functional and technical expertise in providing value engineering services. Infosys is currently focusing on AM as part of its Industry 4.0 journey.

When adopting any disruptive new manufacturing technology, firms will go through a rigorous assessment process to understand the potential benefits, and to prove the reliability and capability of the production process. The investment in time, resources and equipment to achieve this can be significant.

Renishaw's network of Solutions Centres, located across Europe,



North America and Asia, lowers this entry barrier by providing cost-effective access to machinery, facilities and AM expertise. Equipped with the latest AM machines and staffed with knowledgeable engineers, the Solutions Centres provide a confidential development environment in which firms can explore the benefits that additive manufacturing can bring to their products, and quickly build their knowledge and confidence in AM as a production technology.

Each Solutions Centre features Incubator Cells, private development facilities containing an AM machine and all the ancillary equipment needed to set up, build and refine a new product design. Renishaw can also provide pre-production capacity where the productivity and capability of the AM process can be established. Support is provided in the form of operators and applications engineers, as well as access to a range of machining, finishing, treatment and metrology processes.

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High accuracy length gauge for use in harsh environments

A new, incremental length gauge for high precision measuring and in-process control applications in harsh environments has been introduced by HEIDENHAIN. It is ideal for use in the working area of grinding machines, lathes and other metalcutting machine tools and produces results accurate to $\pm 1 \mu\text{m}$ over its 30 mm measuring range.

Called SPECTO ST 3087RC, the unit has a special housing to protect its precision mechanism. A built-in spring keeps the plunger, surrounded by a rubber bellows, retracted behind a guard and splash cap when the gauge is in its rest position. Extension of the plunger to the measuring position is actuated by compressed air, normally with the coolant switched off.

A significant increase in productivity and a reduction in floor-to-floor time result from not having to transfer components to a measuring station external to the machine tool, or to a quality control department. Should rework be necessary after metrology functions have been completed, in-process gauging preserves accuracy by eliminating the need to set the component up again for

a second operation. High accuracy positional values over the full stroke of the



The pneumatically actuated SPECTO ST 3087RC length gauge from HEIDENHAIN is ideal for high accuracy in-process measurement and control applications in machine tools

gauge allow diverse components to be measured from the same fixture. Internal photoelectric scanning of plunger position by means of a DIADUR scale grating with a $20 \mu\text{m}$ period, together with the use of an especially durable ball-bush guide, permit consistent repeatability of probing even when measuring oblique or curved surfaces.

The ST 3087 RC has an IP rating of 67, so it is totally protected against ingress of dust and is unaffected by high pressure coolant jets and even short periods of immersion. It is also tolerant to extremes of temperature, vibration and shock. The 1 VPP interface opens up many possibilities for feedback to a machine tool control, as well as for logging measured results and processing them for statistical analysis.

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GB Precision improving communication and saving metrology data

Birmingham-based precision engineering firm, GB Precision has expanded the benefits it is obtaining from its toolmakers' microscope by equipping it with a microscope camera which transmits the image from the microscope directly, in real time, to an attached PC screen.

As director, Paul Turner explains; "This has greatly increased the advantages we gain from the toolmakers' microscope, transforming it from solely an inspection tool into a flexible communication device that helps us solve engineering problems and so improve the engineering solutions we provide to our customers.

One of the issues with using a microscope on its own, is that, naturally, only one person at a time can view the image. That's inconvenient when you want to discuss a specific feature, angle or geometry with members of the team.

Using the camera attachment, the image is displayed directly on the PC screen, so several people can simultaneously see the component under discussion, and if the viewing angle, position, magnification



needs to be altered, again, all parties see the change immediately."

Another significant benefit is the ability to automatically store data directly to the PC, so maintaining a detailed record for future use, a growing requirement of customers in many advanced engineering sectors, such as aerospace, medical and pharmaceutical.

The camera provides built-in mouse control, allowing the user to interact directly with on-screen menus to record photos of the microscope images, as well as measurement functions including the ability to draw freehand lines, measure perimeter and area of enclosed features.

Last, but by no means least, viewing the images on the large PC screen is a much more ergonomic process than looking down a microscope eyepiece, making detailed image scrutiny more comfortable, and therefore likely to be more efficient and effective.

GB Precision was established in Birmingham in 1968. Its current factory of 8,000 square feet has been significantly extended to accommodate new equipment and to cope with increased demand.

The company invests in the latest, high quality machining technology in order to offer customers a comprehensive range of precision engineering services, engineering complex geometries to tight tolerances through multiple machining steps all in-house.

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Component traceability takes off in aerospace manufacturing

Advances in marking technology can help the supply chain to implement traceability procedures to the manufacture of their aerospace components, according to Alastair Morris, sales director at Pryor



Traceability is an everyday issue for anybody who takes a commercial airline flight in which your luggage tag (and a sophisticated back office system) helps to ensure that you and your bags are reconnected at your destination.

However, the issue of traceability is also critical in aircraft manufacturing. In this case, the issue is about the quality of components, and passenger safety. In most cases of faulty component manufacture, a replacement part is simply shipped and replaced. In the aerospace industry, it is much more serious, going beyond a business problem and into one that is potentially a matter of life and death. As a result, traceability has long been a vital element in aerospace manufacturing to ensure reliability and enable the identification of the root cause of potential problems.

Traditionally, it was a luxury affordable only by firms at the top of the supply chain, which had the capital and capabilities to implement the complex, costly technology required to track components. Now, unique-part identification and traceability has become more affordable and accessible to the wider aerospace supply chain thanks to the dawn of Industry 4.0, advances in networking and the introduction of sophisticated and cost-effective solutions.

The result of all this is a manufacturing industry in which businesses of all sizes and production scales can benefit from enhanced inventory management through better traceability.

Industry 4.0 describes the manufacturing industry's move towards the 'smart factory,'

through factors such as improved data gathering, increased digitalisation and the ability to connect devices together.

In the case of traceability, the immediate availability of digital data means that parts can be 'tagged' with every aspect of their history. This extends beyond factors such as the simple date and location of their manufacture and could include which machine they were made on, down to the exact production run.

This information could be vital in preventing accidents. For instance, identifying a 'rogue' production batch could ensure that other suspect parts in the field are replaced, or at least tested, before they have the chance to fail.

Small firms, big benefits

Much of the focus of these types of systems is on how life-cycle traceability can pinpoint the source of quality problems. However, they can also help to improve the manufacturing processes in a single plant, through the use of marking and tracking systems, which are relatively inexpensive to introduce.

Small firms in particular can reap big benefits, including enhanced profitability, by ensuring that every component can be individually identified.

Implementing a system that enables unique identification at the component level goes beyond dealing with product recalls and knowing what is already out in the field. It allows companies across the entire supply chain, however large or small, to monitor production data and use it to find manufacturing efficiency savings, while cutting costs and material waste.

For example, if individual parts are marked with an ID tag early in the manufacturing cycle, they can be scanned repeatedly at reading stations as they pass each stage – building up a log of essential information about production processes. This data can then be analysed against other parameters and used to detect trends and possible areas for operational improvements, as well as pinpointing quality concerns before the component leaves the factory.

Making the most of marking

Effective marking is essential to any successful traceability system. If parts cannot be distinguished from one another, it is impossible to track them. There are many different ways to identify components. Traditional methods of tagging parts, such as a sticky barcode label or human readable serial numbers, are still widely used, and



serve their purpose up to a point, but they are not truly permanent, and come with a number of faults.

For instance, sticky labels can peel away if they come into contact with moisture or grease, or are placed in challenging environments. Printed IDs can become illegible over time. However, machine-readable Data Matrix 2D barcodes are quickly becoming an industry standard for a number of reasons.

Firstly, the storage capacity is much higher than it is with other codes, as a huge amount of information can be held in small, unique Data Matrix identifiers. This enables large data banks to be built up containing details of manufacturing parameters, the origin of a part, how long it takes to travel between production line stations, or even the ambient temperature of the factory. This increases the intelligence that can be retrieved when looking for possible performance improvements.

Data Matrix codes are ideally suited for marking directly onto a part. Because they can be extremely small, there have been applications in which they have been laser etched smaller than 0.2 mm² so they can be used on the most compact components.

One of the most effective marking methods in aerospace is Dot Peen. It is the go-to option for a number of important reasons: for starters, it is low stress, but since it can be applied with a controlled and repeatable force it also delivers an unrivalled level of consistency.

Perhaps most importantly, Data Matrix marks feature built-in redundancy: if they get damaged, scratched or worn away, they can still be scanned and the data accessed without any loss. This level of consistency is crucial for life-cycle traceability if the parts are to be scanned in the field and traced back to the supply chain.

Implementing part traceability

Reaping the maximum benefits of traceability is heavily dependent on the systems and software that are used. The latest developments are moving towards performing marking, vision and data management in one fully integrated solution as part of a highly automated smart factory. Pryor, for example, has introduced complete systems that comprise marking and reading devices along with sophisticated data management software to enable firms implement traceability simply and effectively.

The developing Industrial Internet of Things means that the systems and captured data can become an even more powerful production tool when connected with existing technologies within a factory, such as manufacturing execution systems, and networked and controlled on a central server. At the most basic level, it can check the part IDs to ensure each component has a unique mark and that there are no duplicates.

In production monitoring, the specialised software can prevent potential quality problems by flagging up bottlenecks and issues in real time. The software will immediately highlight any issues, allowing manufacturing and maintenance engineers to intervene quickly, remedy the fault and eliminate the risk of downtime.

Beyond connectivity within a single facility, advanced traceability software systems can be networked between global aerospace manufacturing sites to allow for remote knowledge sharing, whatever the scale of the operation. If there is a quality issue beyond distribution, for example when the product is either in the assembly stages



or out in the field, it will be possible to drill down into the system data to identify the specific faulty component. This way, only one needs to be recalled, rather than an entire batch.

Competitive advantage

The main benefits of traceability are in line with those from other attempts to automate the processing of information in manufacturing. For instance, improved data accuracy reduces the chance of human error and can handle much larger volumes of information. There are also multiple opportunities to boost productivity, from supplying replacement parts automatically to avoiding product recalls. At the same time, collecting data automatically frees up staff to concentrate on more productive tasks.

Superior levels of process control and traceability are becoming the industry norm in the aerospace sector. Original equipment manufacturers expect their contractors and suppliers to provide this degree of production activity intelligence as standard, and it can be the deciding factor when awarding contracts.

Ultimately, traceability helps firms across the supply chain to improve productivity and business performance, as well as significantly enhancing the quality of parts and aircraft safety.



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Vision-based laser marking reduces risks on automotive recalls

Instances of recalls in the automotive industry seem to have increased somewhat in recent years as vehicles become more complex. These occurrences cost volume carmakers dear, with millions of vehicles from different manufacturers being recalled across Europe the USA and other regions including China.

Although some recalls are for minor issues, there are cases where the recall is safety critical. One in particular relates to defects in brake hoses and it is in these instances where accurate product traceability is absolutely paramount. Laser-based part marking is the solution preferred by many manufacturers within the automotive supply chain, as the process is ideally suited to many of the diverse materials used within the industry.

Andy Toms, director of Bromsgrove-based TLM Laser, the UK and Ireland distributor for FOBA Laser, explains how the combination of machine vision and laser guarantees component quality, enhances traceability and increases competitiveness for component manufacturers:

The permanent marking of safety-critical parts, such as the brake hoses mentioned is an essential requirement within the automotive industry. In order to be resistant to a multitude of external influences during manufacture and use the marks produced on automotive parts they must be indelible and also resistant to temperature, light and lubricants.

The high marking quality and consistency delivered by lasers ensures optimum levels of legibility and secure traceability. Of even greater importance however, is ensuring that the correct marks are applied in the right position, on the correct part variant and on a non-defective part. Achieving these objectives ensures that scrap levels are drastically reduced and both productivity and efficiency levels are increased significantly.

As a result of increased risk of recalls, there are growing demands within the supply chain on quality management procedures. Combine this with the ever-present cost challenges within the sector, and it is clear that these can be



Automotive component with traceable laser marked code, produced using FOBA's unique closed loop marking process

significant factors in influencing competitive advantage for component manufacturers.

Closed loop laser marking enhances safety and traceability

A unique and innovative closed loop machine vision and laser solution from FOBA contributes to product safety and helps to reduce the risk of recalls. Provided as a completely integrated solution within the laser system, the patented vision system IMP (Intelligent Mark Positioning) ensures consistent and correct marking with pre- and post-mark optical validation, as part of a three-stage closed-loop marking process.

Prior to marking, the system performs a part validation check to ensure that the part to be marked is the correct variant, followed by a part verification check to ensure that the part has not been marked previously. The automatic mark alignment function is used to check the position of the mark relative to the position of the to-be-marked component. It is important to note that the part does not have to align to the mark, as the mark position is automatically aligned accurately to the part.

Only once these checks are completed satisfactorily is the laser mark produced. The post marking verification stage validates

that the laser marks are where they are expected, checking for positioning, alignment and size. Optical character verification (OCV) then validates that every character marked by the laser matches the content expected. The contents of 1D and 2D Datamatrix codes are also read and compared to the content expected.

This unique three stage marking process, combined with the patented vision system (IMP), ensures the highest levels of process reliability and most importantly, zero defect marks. This is a crucial contribution to guaranteeing quality assurance and helping to ensure a "no fault forward" manufacturing process. The code reading option is especially important for documenting production and component data, and for the subsequent fast and accurate identification of a product in the event of a recall situation.

Whilst laser marking in itself cannot influence recalls due to mechanical or electrical failure etc., FOBA's unique closed loop process can eliminate issues that may



FOBA M2000 and M3000 Laser Marking Systems are the ideal solution for many automotive component marking applications

be attributed to incorrect part types or variants being used and also ensure that if traceability is required, that the marks will be in the place expected and readable.

TLM Laser
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Longer battery runtime due to new 5.2 Ah battery

Hand-held marking system FlyMarker® mini is now optional available with a powerful 5.2 Ah rechargeable battery.

The battery operated hand-held marking system FlyMarker mini is mainly suitable for durable markings of big and unmovable work pieces directly on-site.

As well as the two 18V-Lithium-Ion-batteries with 2.0 Ah which are integrated in the standard scope of supply, there is now an optional powerful 5.2 Ah battery available. With this powerful battery, a working period three times longer compared to that of the standard battery is possible.

The portable marking system is suitable to mark several materials with a hardness of up to 63 HRC. A quick and reliable technology and the easy operation characterise this battery-operated marking unit. The housing consists of glass fibre reinforced plastic and is therefore break resistant. Next to characters and numbers, it is also possible to mark logos, test symbols and Data Matrix Codes.



For the transportation to another construction site or a different hall, the practical carrying case can be used. The complete standard scope of supply as well as the optional available 5.2 Ah battery can be stored in this carrying case.

Depending on the material and the customer requirements, the marking force and with this the marking depth can be adjusted individually.

The clearly designed software is very easy to understand and enables an intuitively operation of the hand-held marking system. Thanks to the use of latest processor technologies, a fast navigation and quick access times to the marking files is possible.



Several hundreds of marking files, fonts and logos can be stored and administered in the internal memory of the marking unit. There are many language versions available.

To find out more about the FlyMarker Mini hand-held marking system, contact:

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Continuous improvement drive leads to export boom for ACE

A leading Shropshire precision metal specialist is setting its sights on international expansion after boosting its export work by 10 percent in the first seven months of 2017. Advanced Chemical Etching Ltd (ACE), which employs 50 people at its state-of-the-art facility in Telford, has secured three big projects in aerospace, communications and the medical sector, taking overseas trade to 38 percent of its £5 m turnover.

It comes after the company embarked on a continuous improvement drive that has increased on time delivery and right-first-time performance, two crucial factors in securing the recent contract wins.



"Our export activity has been steadily growing year-on-year since 2010, but the last seven months have definitely seen a spike that we're hoping to sustain," explains Ian Whateley, managing director of ACE.

"There may be an element of the pound slipping making us more competitive. However, a lot of the projects we are winning are extremely technical and not many firms around the world can deliver the complexity of components the customer requires.

"Interest has come from all over too, for example from Germany, Luxembourg and United States of America. We've even had orders from customers in Australia, New Zealand, South Korea and Thailand."

ACE's scope of activities is far and wide and can include anything from safety critical components for aircraft and cars to simple washers, electronic connectors and ornate clock faces.

With the latest production machinery and a culture of ongoing investment at its 25,000 sq ft facility in Telford, it ensures it

can make products in materials, including stainless steel, nickel alloys, copper, beryllium copper, phosphor bronze, brass and, thanks to ground-breaking new processes, aluminium, titanium, molybdenum, nitinol and elgiloy.

The latest continuous improvement exercise has been in operation for six months and has involved collecting data on current operating parameters and reviewing what is working well and what could be improved.

This has seen the firm alter its chemistry settings and the introduction of twice daily process control checks, which have already resulted in a two percent increase on right first time figures and the potential for a 10 percent boost in throughput on certain products.

Ian Whateley continues: "We are really pleased with the results of this latest exercise and we now have daily improvement meetings to ensure all work instructions and operating procedures are being reviewed.

"It has also allowed us to create a robust new product introduction system with technically challenging jobs and new processes for exotic materials never before etched."

Advanced Chemical Etching, which is working towards the AS9100 aerospace quality standard, has made a number of key appointments to cope with recent expansion, including a new technical sales specialist and business development expert.



Located in the centre of the UK's manufacturing heartland, Advanced Chemical Etching Ltd (ACE) is constantly stretching the boundaries of innovation in delivering solutions to some of the world's biggest names.

The company specialises in the manufacturing of precision photo etched metal components for customers involved in aerospace, automotive, electronics, medical, fuel cell, telecommunications and more. ACE's unrivalled ability to offer prototype components to pre-production and small volume fulfilment has seen it increase its market share in aerospace, F1, fuel cells and medical - all industries that demand safety critical components and parts made in a full range of materials and tolerances.

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Technifor launches new range of direct part marking equipment

As the world's largest manufacturer and supplier of permanent marking, Technifor has renewed its complete range of engravers and markers with endless innovative features included in each system.

With four different cutting-edge technologies: Fibre, Hybrid, CO₂ and Green lasers. Technifor's laser engravers and markers can be used with a wide range of materials. This complete range enables the marking of virtually any material from metal to plastics as well as organic.

The successful F-series Fibre laser range is ideal for high speed metal engraving. Its compact head, connected electronics and IP rating make the Fibre its integration onto production line simple as well as safe. This is particularly suited for use in the harsh industrial environments with an IP54 rated head-sealed and protected from dust and water projections.

Fibre technology is ideal for fast or deep marking of metal, whereas Hybrid provides increased versatility enabling the marking of a wider range of plastics and metals, including precious metals and alloys. This



series has a 'one-box' construction designed for both plastic and metal marking. Its modern precision laser has one of the most competitive price points of any on the market today.

Green lasers, often referred to as 'cold marking,' are the lesser-known type of lasers. Designed primarily to tackle difficult to mark plastics, the 15µm beam diameter produces extraordinary detailed or fine intricate marking.

Finally, CO₂ lasers are predominantly used on organic products such as wood, glass, rubber, ceramic and many plastics. Advanced features include programmable and automatic focus, 3D and on-the-fly

marking and a wide range of accessories for both benchtop and integrated systems.

Dot peen makers have also seen a renewal in the range, with the introduction of several new systems. The ultra-compact XE320 marker is a portable system designed to mark components too large for a benchtop engraver. With a total operating weight of only 2.7 kg combined it enables the portable system to achieve deep marking into metal.

Another addition to Technifor's dot peen and scribing range is the Impact benchtop marker featuring a large tactile LCD interface screen, allowing users to operate the machine with minimum training. The new range of markers is now also supplied at no extra cost with a Windows™ based software enabling easy to use, off-line programming of marking templates.

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One of the largest ever Prima Power FMS installed in UK

Prima Power has delivered one of its largest ever Flexible Manufacturing Systems (FMS) to be installed in the UK. The highly-efficient FMS now provides the well-known refrigeration manufacturer, Epta UK with unmanned, lights out fabrication production capabilities.

Founded in 1928 in Bradford, West Yorkshire as George Barker and remaining a major employer in the city, the business was purchased by the Epta Group in 1999 and this year was rebranded as Epta UK. Today, the company is renowned in the UK and beyond for its in-depth knowledge of, and its vast experience in the design and production of custom-made refrigerated units.

Epta UK is an important part of the EPTA Group, providing industry leading product management, system design and a range of manufacturing capabilities that result in the delivery of advanced refrigeration solutions. Since its absorption into the EPTA Group, Epta UK has continued to enhance its process' in terms of technological know-how and manufacturing skills.

The company's impressive, Bradford based production facility was renovated and expanded in 2007 and now covers 19,500 square metres. Ever increasing levels of demand for the company's refrigeration products recently prompted Epta UK's staff

to search for a highly-efficient, automated system that would produce the required quality as well as quantity of fabricated parts.

After briefly considering a couple of alternative systems, a practical demonstration of the Night Train FMS® proved that the advanced Prima Power solution was able to satisfy all of Epta UK's challenging requirements, as it is able to perform high-speed laser cutting, punching and forming, as well as the storing of raw and processed material and parts. Prima Power's LPe8f Combi, machine lies at the heart of the highly productive FMS that was designed to satisfy Epta UK's specific demands.

Simon Hayes, methods & technology at Epta UK, explains: "As an established market leader, we currently employ approximately 540 people both locally and nationally, our staff work closely with major food retail groups on the design, production and installation of custom refrigeration cabinets. Our cutting-edge designs and the quality of our refrigeration products are major factors in our continuing success. In order to keep pace with growing demand, and to ensure the continued quality of our products, we recently looked for a comprehensive fabrication manufacturing solution.

"After deciding that the Prima Power system would deliver the needed major boost to production, our meetings and close cooperation with Prima Power's staff resulted in the development of what is the ideal Flexible Manufacturing System for both our current and our foreseeable needs. Since its installation Prima Power's Night Train FMS has proven its ability to integrate an entire fabrication process into a single, all-embracing manufacturing cell. The smart system provides automatic material handling and includes intelligent buffering. Automatic information flow from programming to production reporting is also a major benefit. In-short, the use of Night Train FMS with its unmanned, lights-out capabilities means that we have minimised part manufacturing times and maximised available production time."



Simon Hayes continues: "Prima Power's Night Train FMS takes up much less floor space than each of the individual manufacturing and storage elements would if purchased as separate units. Also, the system ensures less work-in-progress at any given time, resulting in a reduced requirement for storage.

"Whilst Prima Power's Night Train FMS takes care of all logistic operations, such as sheet-metal and manufactured component movements and all storage needs, the highly productive core of our new FMS is the Prima Power LPe8f Combi. This extremely flexible machine gives us the advantage of multiple Prima Power technologies, laser cutting, punching and forming all combined in the same adaptable package."

Trains don't stop running at night so why should production?

The history of Prima Power's renowned Flexible Manufacturing Systems is a long and distinguished one. Almost three decades after the company's first installation, hundreds of customers throughout the world have reaped the benefits of the efficiencies delivered by Prima Power's bespoke, highly productive FMS systems.

Prima Power's Night Train FMS automates the entire material and information systems



of a production facility and combines all individual manufacturing stages into a single cohesive and flexible process. All Night Train FMS systems are carefully tailored to suit customer specific needs and are designed to incorporate the most appropriate elements from Prima Power's comprehensive range. High performance Prima Power machine tools, integrated cells, automatic material handling solutions and software components are combined, and due to the sheer breadth of Prima Power's offerings, the optimum, cost-effective solution can always be created.

An innovative 'four-in-one' solution

Prima Power's LPe8f, as included in Epta UK's Night Train FMS, combines advanced servo-electric and cutting-edge fiber laser technologies in a manufacturing solution that offers outstanding flexibility, speed, accuracy and productivity. Accurate fiber laser cutting, punching, forming and bending tasks are performed at high speeds. Ease of operation, a large tooling capacity and minimum setup times add to the efficiency of the advanced Prima Power machine.

The LPe8f is able to accommodate sheet



sizes up to 4,300 mm x 1,565 mm and has a maximum working area w/o repositioning of 3,074 mm x 1,565 mm. The COMBI LPe8f is available with high brilliance fibre laser sources of 2 kW, 3 kW or 4 kW. In addition to the usual materials, the COMBI LPe8f's laser is also able to accurately cut materials such as copper or brass. Punching speeds of up to 1,000 hpm / 1 mm between holes are delivered with forces of 200 or 300 kN.

Whilst tool rotation speed up to 250 rpm is provided.

Simon Hayes concluded. "As part of the EPTA Group we adhere to the group's strict environmental policies that are focused on ensuring energy conservation and environmental impact reduction. We pursue these policies through initiatives such as the use of F-Gas compliant natural refrigerants. "Our purchase of the Night Train FMS®, incorporating the LPe8f Combi, further reduces our manufacturing environmental impact as. Due to the use of technologies such as servo-electric punching and advanced fiber laser cutting, the FMS has very low energy consumption requirements. The system doesn't need hydraulic oil, removing the need to dispose of hazardous waste, in addition the Prima Power system produces lower heat and noise emissions, which is better for our operators and also for the environment."

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High-performance tube and pipe bending machines

Schwarze-Robitec is presenting its extensive product range of tube and pipe bending machines "Made in Germany" at the Fabtech trade show held in November in Chicago, USA. The tube and pipe bending specialist will exhibit its CNC 100 E TB MR and will demonstrate the speed and precision of its current high-performance machines. In addition, experts from the American branch office and the Schwarze-Robitec sales team will be on hand to answer any questions that visitors may have on the subject of tube bending.

Schwarze-Robitec places the high-performance tube bending machine CNC 100 E TB MR at the centre of its trade show presence. This all-electric machine enables companies in the automotive industry to manufacture the serial production of pipe systems even faster and more efficiently. The machine is equipped with numerous components, which reduce downtimes and thus increase production productivity. This also includes the rapid clamping system "Quick Tool Unlock". Its central clamping function allows for a fast

change of bending tools. And best of all, the easy tool changes require a minimum of tools. In addition, customers benefit from a high degree of sustainability, as this superior machine can be used to bend a particularly wide range of different tube and pipe dimensions. The NxG control system also contributes to the fast cycle times of this high-performance series. Thus, the users can expect a reduction in production time of up to 35 percent due to a simultaneous axis movement.

Fabtech is the meeting place for the metalworking industry in North America. Schwarze-Robitec uses the trade fair to meet customers as well as interested parties and to provide visitors with information about the latest developments. This also includes the fact that the American branch of Schwarze-Robitec has moved into new office and warehouse facilities in Grand Rapids (Michigan). Here, in its 2000 square feet storage facility, Schwarze-Robitec keeps an inventory of the most important



spare parts for its custom-made machines. As a result, the tube bending specialist can respond to service requests in the USA even faster and with a support that is second to none. Thus, Schwarze-Robitec once again underlines its particular market proximity.

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OMAX expands its new line of essentially-featured abrasive waterjets

OMAX Corporation has announced the launch of the new GlobalMAX® 1508 and 2040 abrasive waterjets, extending the GlobalMAX line of reliable and practical machines capable of cutting virtually any material. The GlobalMAX 1508 offers a compact footprint and cutting area for rapid prototyping, while the GlobalMAX 2040 can accommodate large sheets of material for cutting large parts or multiple smaller nested parts.

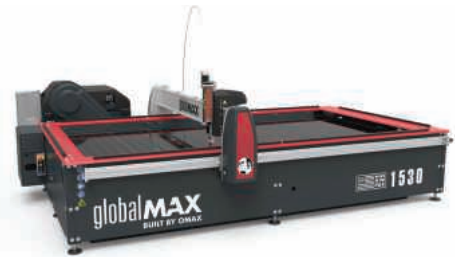
GlobalMAX waterjets feature easy to use OMAX software, space-saving table design, and efficient direct drive pump technology with value and durability as priorities.

"The GlobalMAX 1508 and 2040 models were added to the GlobalMAX product line to provide more size options for customers seeking an essentially featured abrasive waterjet," says Stephen Bruner, vice president of marketing at OMAX Corporation. The GlobalMAX 1508 and 2040 products feature our proven direct drive pump technology, easy-to-use software, and innovative motion control technology."

Both products will be produced in Kent, Washington, USA to ensure quality and component compatibility. International OMAX distributors are certified installers and servicers and are trained at OMAX headquarters.

The GlobalMAX 1508 and 2040 feature 0.8 x 1.5 metre and 4.0 x 2.0 metre cutting bed sizes, respectively. There are also two direct drive pump sizes available, 20 HP and 30 HP. Like all OMAX abrasive waterjets, the GlobalMAX can cut almost any material and a wide variety of material thicknesses without any heat-affected zone (HAZ). The machine does X/Y axis cutting with three degrees of freedom and has a number of compatible accessories, including a terrain follower, a pneumatic drill and bulk garnet feed hopper.

Based in Kent, Washington, OMAX Corporation is the leading manufacturer of advanced abrasive waterjet systems. Owner of the OMAX, MAXIEM, and GlobalMAX brands, the company designs waterjet



systems that feature intuitive software, efficient pump technology, and a wide range of accessories. The ISO 9001:2015 certified company designs, manufactures, assembles and tests components as a complete system to ensure optimum performance.

For more information, visit <https://global.omax.com>, connect with the company on Facebook, Twitter, LinkedIn and YouTube, or contact:

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FC Laser achieves record monthly turnover

FC Laser saw its customer activity grow by 20 per cent last month, which led to the company achieving its highest ever monthly turnover.

The Derbyshire-based laser cutting specialist, which is celebrating five years of operation this year, puts this record level of business down to two factors - the company is attracting high levels of new business while retaining existing customers through its commitment to the best service standards in the industry.

In the last 12 months, FC Laser has experienced growth of 30 percent and this recent level of activity represents a significant development for the business. Part of the reason for the growth can be put down to the appointment of a dedicated business & service development manager, Elle Miller, whose role involves travelling around the country liaising with existing customers and potential clients.

FC Laser's managing director Danny Fantom says: "Everyone in the company is always thinking about customer service and how we can improve it and then improve it

again. On top of this, having a full-time person in a business and service development manager role has paid real dividends and underlined to our customers just how seriously we take their level of satisfaction with the services that we offer.

"We are absolutely delighted with the 20 percent increase in customer activity that we saw last month and with achieving our highest ever monthly turnover, but we will not rest on our laurels and will keep pushing to improve our customer service even further. The FC Laser name is synonymous with quality and that runs throughout the entire business."

The phenomenal success of precision laser cutting specialist FC Laser is based on a combination of the highest levels of quality control (the company is accredited to the latest ISO 9001 and EN1090 standards) and the fastest turnaround times in the industry, from initial quotation to final delivery. Respected throughout the highly competitive metalworking sector for its 100 percent commitment to deliver on promises it makes to customers, FC Laser uses the



Elle Miller, FC Laser's business & service development manager

very latest cutting technology, including a suite of Bystronic laser centres to deliver a level of service not often associated with laser cutting, whether working from a customer's CAD files or hand-produced drawings. This has helped the company to produce one-offs or 1,000-offs for satisfied customers in a range of industry sectors, including architectural and structural, agricultural, shop fitting and automotive.

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Mobile press brake offers high bending capacity

Swiss sheet metalworking machine manufacturer, Bystronic, has launched a new press brake that can be moved around a factory by fork lift truck. In a footprint of less than three square metres, it offers a generous bending capacity of 80 tonnes over 1.5 m.

Called Xpert 80, it joins the smaller 40-tonne, one-metre Xpert 40 model that can be similarly repositioned and has proved popular since its introduction at the 2014 EuroBlech exhibition in Hannover. Both machines boost productivity by avoiding having to use a large, slower press brake to bend a small component. Output can be increased further by relocating the machines next to a laser cutting cell, another press brake or other machine tool.

The new, larger press brake can bend material up to 20 mm thick and is suitable for almost any task, from large volume runs to small batch, job shop production of complex parts. The machine may be equipped with multiple tools to enable all bends to be completed sequentially. ByMotion drive control, a Bystronic development, ensures

that the Xpert 80's upper beam and backgauges are accelerated with high precision. Fast bending speeds up to 25 mm/s are attained.

Ergonomic design features include drawers built into the side of the machine for housing bending tools and other equipment within easy reach of the operator. A height-adjustable, folding table at the front of the machine can be used as a working surface or storage area. Power consumption is low due to the machine's energy conserving design and the start-stop technology employed in the drive train.

Upper and lower tools self-seat during clamping as the operator presses an icon on the machine's touch screen control. Tool positions are automatically calculated as a part of the program and flashing LEDs on the front of the upper beam instruct the operator where the tools need to be mounted to correspond with the 3D movements of the high speed backgauge.

The ByVision touch-screen control, which is mounted directly in front of the operator, displays simple 3D graphics of the bending



process. An optional bar code reader allows the program to be called from a bar code on a work sheet or from a QR code etched on the blank should the owner have a Bystronic laser cutting machine.

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In a class of its own

The compact new mitre-cutting bandsaw HBE320-523G from Behringer

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

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

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

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

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

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

"For reasons of cost and flexibility, profiles

are generally purchased in starting lengths of up to 12 m and then sawn to size", he adds. The new mitre cutting bandsaw is easily able to cope with both structural steels and stainless-steel profiles.

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

The tilt of the band wheels helps prolong the life of bandsaw blades by reducing fatigue due to cyclical bending. A fully automatic height adjustment facility for the saw frame depending on the material height and lowering of the saw when in rapid traverse help cut non-productive time to a minimum.

The inclined position of the bandsaw blade allows components such as girders, angled steel and U profiles as well as hollow rectangular profiles to be sawn at higher speed and with less burr.

The sawing unit is mounted for easy turning in generously dimensioned axial roller bearings and can be swivelled with a simple manual action. The closed material table simplifies material handling directly at the cutting point. The machine comes with a microspraying system as standard.

The machine can be supplemented as required with infeed and discharge roller conveyors, measuring devices and cross conveying systems, as well as NC angular adjustment. Behringer GmbH supplies these highly process-reliable customised transport solutions from its own in-house steel production facilities.

BEHRINGER will be exhibiting at BlechExpo 2017 from 7th to 10th November at the Messe Stuttgart in **Hall 4, Stand 4503**.

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KALTENBACH Ltd announces co-operation with leading US bandsaw manufacturer

KALTENBACH Ltd, the UK Sales and Service Centre of the KALTENBACH Group of companies, has announced new representation of the leading, US-based bandsaw manufacturer, HE&M Saw, for the UK and Ireland.

HE&M Saw designs and manufactures a widely respected range of both horizontal and vertical bandsaws, with many thousands of installations in North America, Canada and Mexico. Based in Oklahoma, the company history extends back over 50 years and remains under family ownership and management. The HE&M Saw product range includes over 60 high quality models, designed for solid metal, profile and plate sawing applications across the metals processing industries.

The HE&M Saw range starts with a selection of Pivot Frame models, suitable for sawing materials up to 400 mm diameter. The machines are designed and built with a classic, heavy duty 'American' style. The saw bow is arranged to ensure that the weights and cutting forces are contained directly within the pivot and the kerf channel, giving excellent cut performance and realising the very best from the pivot design approach. This overcomes the commonly expected wear or cut quality issues associated with many, low cost alternatives. The HE&M Saw pivot design gives a superior cut performance, excellent blade life and overall machine longevity, even surpassing similar capacity, twin column models.

For larger capacity sawing, HE&M Saw also manufacture dual column bandsaws, ranging from 450 mm all the way up to 1,340

mm diameter capacity. A heavy-duty design approach is again taken, with a robust portal frame, equipped with low friction guides and mechanically balanced travel, to ensure that the bow descent remains consistent and true to the material. This eliminates the issue of the 'crabbing' effect that is often observed in some dual column machines, where the columns either pass through the bow or are uncontrolled on one side.

Pivot and dual column models are available for both straight and mitre cutting applications and with semi-automatic and automatic, bar-feed controls. Complimenting these is a further selection of vertical bandsaws, designed for cutting plates and profile sections.

For plate sawing, models are available with either travelling heads or travelling tables, suitable for applications where large plates are to be sawn into smaller pieces or strips. A robust design, combined with powerful motors and precision controls allow for the sawing of a wide range of materials, from mild steels through to exotic alloys.

Vertical saws are also available for cutting steel tubes, profiles and sections, offering an alternative solution to mitring and straight cutting such materials. With the sections placed on the sawing table, the vertical head traverses across, rather than down and is additionally able to tilt to the left or right for mitre cutting. This approach allows for the sawing of opposing mitres on multiple pieces in a single operation, a limitation for horizontal bandsaws and a definite advantage for any company producing batches of like pieces.

Support is also a key consideration and KALTENBACH Ltd will hold suitable spare parts and consumables to ensure prompt backup, along with all



servicing engineers being fully product trained. This is reinforced by comprehensive support from HE&M Saw, ensuring that help is always available and, importantly, without any issues arising from the time differences between the UK and USA.

The HE&M Saw range perfectly complements the extensive machinery solutions already manufactured by the KALTENBACH Group, now a part of the German industrial group, Zobel Values AG. Additional partnerships with several further, leading manufacturers of profiling, bending and welding systems permit KALTENBACH Ltd to offer to the UK and Irish markets an unmatched and complete portfolio of some of the best equipment available in the world.

KALTENBACH is a German family-owned company with 130 years of experience in metalworking, KALTENBACH is able to face the challenges posed by a constantly changing global market, with complete confidence.

With more than 22 offices and 10 subsidiaries, KALTENBACH is able to offer superior consultation and service to customers, in a wide variety of industries, such as metals production, metal construction, mechanical engineering, plant engineering and construction, steel trading and vehicle production.

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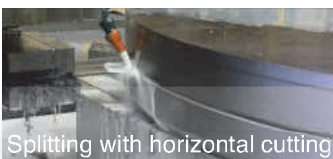
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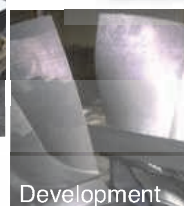
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Kerf enables recycling company to 'design for manufacture'

As a UK manufacturer that exports globally, Ken Mills Engineering (KME) Ltd has come under increasing pressure from low-cost foreign economies that are manufacturing cheaper and often inferior quality products. However, this pressure was alleviated when the manufacturer of material reclamation systems, haulage packing systems, straw shredding and processing systems, balers and conveyors invested in an RUR2500p plasma cutting machine from Kerf Developments as well as an AMADA 220 tonne press brake.

Prior to the installation of both machines, the Littleborough company would buy steel box section and laser cut parts from external suppliers that would be internally fabricated, drilled and formed to complete standard and bespoke product lines. However, the high subcontract cutting costs, unreliable lead times, inability to control the complete process and subsequent quality were key factors to the 50-employee business investing in the new machinery.

The two machines transformed the business, as KME director Andy Mills recalls: "Our standard product lines were facing intense competition from Asian manufacturers, while our bespoke solutions were increasingly complicated to manufacture. The new machines instantly slashed our subcontract costs, labour requirements, streamlined our production and reduced our lead times, as well as giving us the opportunity to design our products for manufacture. Essentially, the investment has given us a huge competitive edge over low cost foreign economies and customers will always see UK manufactured products as a premium brand."



The Kerf RUR2500p plasma cutting machine was supplied with a 4 m by 2 m bed and a Lincoln Electric Spirit 150 amp plasma unit. Capable of cutting material up to 25 mm thick, the machine at the company on the Southern foothills of the Pennines was predominantly cutting stainless steel and mild steel sheets from 1 to 3 mm thick.

Andy Mills explains: "We recognised a need for the machine and prior to installation we estimated 2-3 days use per week usage. Within a matter of weeks, we truly realised the potential of the Kerf machine and in no-time it was running up to 12 hours a day, 5 days a week, as well as during weekends. The ability to cut, chamfer and generate holes made many manual tasks obsolete. In the last few years, we have lost five staff through retirement and the productivity of the Kerf means that we didn't need to replace these employees. In fact, we have become more productive than ever. The Kerf and AMADA machines have improved our overall output as a business by at least 20 percent."

The Kerf RUR2500p proved a real game changer for KME, so the company recently upgraded with a new and larger RUR2500p. Replacing its predecessor, the new RUR2500p has an 8 m by 2 m bed and a more powerful and precise Lincoln Electric Spirit II 275 amp plasma unit with the very latest Ultrasharp cutting technology.

Andy Mills continues: "Our components are primarily small to medium batches that are cut from single sheets, which rarely exceed the 4 m bed length of the previous machine. We recognised that by increasing the bed length we could load one side of the machine whilst parts are being cut on the other end of the bed. This pendulum loading has effectively eliminated non-productive setup times and reduced overall production times by an additional 50 percent."

"The new Kerf RUR2500p has the very



latest Ultrasharp cutting technology and this has improved the precision and surface finishes of the profiles and holes we cut. Additionally, there is less cleaning, no secondary hand finishing and there is less dross from the process."

As well as offering precision levels in the +/-0.5 mm range, the 275 amp Lincoln Electric Spirit II plasma unit has the capacity to pierce materials up to 35 mm thick.

Andy Mills concludes: "The Kerf and



Amada press brake combination is saving us upwards of £250,000 a year in subcontract costs. By purchasing more sheet material than the previous box section and also having complete control over the materials we need, as well as integrating a design-for-manufacture ethos, we are saving an additional £150,000 a year in material. Added to this, there are fewer transport costs as we don't deal with subcontractors."

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New benchmark for automatic deburring machines now available in the UK

FICEP UK has announced that it has been appointed as exclusive UK agent for Costa Lev, a world-leading manufacturer of automatic metal deburring and surface finishing machines.

This range of high quality machines has an unrivalled reputation for reliability, increasing productivity and reducing processing costs for the deburring of plasma/oxi fuel /laser cut parts, the grinding of all flat, ferrous and non-ferrous metal parts to a desired quote. They are also able to polish large metal surfaces to provide the finest finishing available with a complete absence of chatter marks.

When there is a mix of materials or a different finish is required, Costa machines have a unique patented LOCK system which provides total flexibility, reduced downtime between changeover of brushes and easier maintenance.

Depending on the edge radius required, vertical or orbital type brushes can be used,

either individually or in multiple groups to ensure the required finish is achieved on the top or the top and bottom sides of the component in just one pass.

Parts up to more than 400 mm thick, and more than 3,000 mm wide can be processed and the polishing systems have a feeding speed of up to 50 metres/min. This makes these machines the ideal solution for removal of slag, burrs and oxide, even when the parts are warped or uneven.

When polishing wide stainless-steel sheets, the quality of the surface finish remains consistent until belt life end as the machines automatically compensate for wear of the belts. This is possible, thanks to the machine's inbuilt PLC, which extends the life of the consumables, further reducing processing costs.

All machines in the Costa Lev range exceed CE and OSHA approval, with noise reduction systems and special devices to protect the machine operators and also



prevent parts from getting damaged. Not only do the machines eliminate dangerous and time-consuming manual grinding work, they also massively increase productivity and reduce production costs.

FICEP UK

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Upgraded bandsaw blade cuts toughest materials, with longer blade life

Following stringent testing and field trials, a major upgrade of Bahco's popular 3851PR bandsaw blade has been carried out, improving blade hardness, toughness and performance. This upgrade now offers a wider operating envelope within each TPI, coupled with more precise tooth form, making the new 3851PRX ideal for cutting the toughest materials. It's a more universal blade which will cut a greater range of workpiece sizes and shapes than conventional blades.

"This represents a massive evolution of the 3851, with improvement in three key areas: raw material, geometry and production process," says Peter Storr, Bahco's bandsaw specialist in the UK. Here's a summary of the improvements made:

Raw material: a new, higher grade of HSS Special design wire is now being used, improving both the hardness and toughness of the blade.

Geometry: the changes in geometry have only affected the variable tooth, giving a



distinctive new look to the 3851PRX family and clearly differentiating it from the rest of Bahco's bandsaw assortment. The more traditional constant tooth (H & HA & R) version remains unchanged.

Production process: the 3851PRX is manufactured using machinery specially developed for the upgrade, giving a better, consistent finish to the material. It also generates less friction and vibration, consequently improving fatigue failure.

Trials and tests: the upgrade has been strongly supported by R&D testing and field trials, using prototype, standard and main competitor blades.

Field trials were designed to replicate real life application while scientific tests evaluated how the blades performed when used in extreme conditions. In both test types, the new 3851PRX outperformed the old 3851 and its main competitors.

Product features and benefits: the improved blade is now available as a complete assortment from 6 mm to 80 mm. It offers cutting solutions in both production cutting and general-purpose applications.

Improved chipping resistance is achieved without compromising hardness, with less vibration and greater resistance to heat and wear, giving longer blade life.

Applications comprise: contour cutting, including aluminium and stainless steel, along with production cutting and general-purpose applications, cutting solids, bundles, even profiles and castings.

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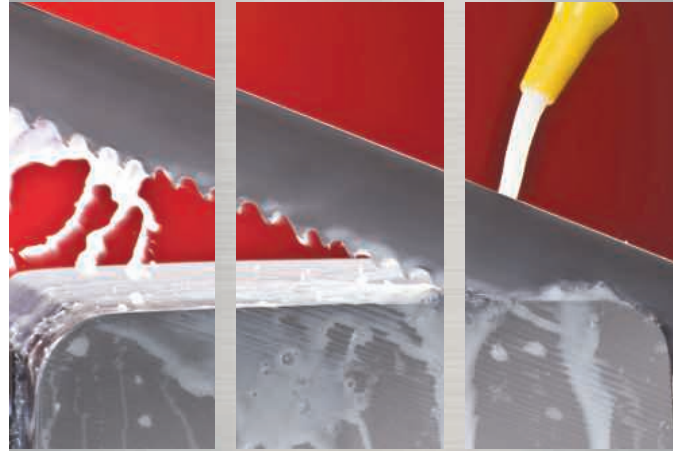
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Stockholder increases bandsawing capacity in a smaller footprint

Two bandsaws from KASTO replace four conventional machines

At the Newcastle-under-Lyme facility of special metals stockholder, Langley Alloys, two German-built KASTOtec bandsaws specified for cutting with tungsten carbide tipped (TCT) blades have replaced four out of six machines from a different supplier, which are effective only when bimetal blades are used.

As the downfeed on both KASTOtecs is three times faster, overall cutting capacity across the six machines has increased by one-third while the floor area occupied has decreased by a similar amount. This is precisely what Langley Alloys needed, as orders have increased sharply since the start of 2017 but there is no room on the site for more bandsaws to handle the higher throughput.

As an added bonus, the freed space has allowed the stockholder to increase the range of materials and sizes that it holds to well over 1,000 line items. For example, Alloy 254SMO stainless steel is now stocked in bigger quantities, Alloy 2205 duplex stainless steel has been added and the variety of nickel alloys has been expanded from Alloys 625 and 718 to include Alloys 725, 825 and K-500. The investment, approaching £2 million in stock alone, means that Langley Alloys has extended both the range and depth of material available.

Business development director Rodney Rice says: "Our success is despite half of our business historically being in the oil and gas sector, which has been depressed in recent years.

"Offsetting that, we have seen significant growth from many of the other industries we supply, including defence, marine, pulp and paper, chemical processing and general engineering.

"Responsiveness to customer demand is crucial. Installation of the KASTO bandsaws means that we are able to stock a broader range of materials that closely match users' requirements and cut them quickly for supply in short lead-times."

Operations director Richard Bulmer adds: "Cutting with TCT blades was key to making this a reality. We tried using them on our



The KASTOtec AC4 in operation at Langley Alloys, Newcastle-under-Lyme

older bandsaws but they were not rigid enough to cope. The band would squeal through the guides and excessive vibration wore the teeth out quickly.



The second KASTO bandsaw installed by Langley Alloys is a purpose-built 'carbide' version, KPC, which has additional equipment designed to suppress vibration

"We were only able to cut two square metres of nickel alloy with a carbide blade, which was about the same as with a bimetal blade but at three times the consumable cost.

"We are not quite there yet, but we will soon be getting five to six square metres cutting area per TCT blade on the

KASTOtecs, so cost-per-cut will be equivalent to bimetal in terms of the consumable cost alone.

"Taking into account lower labour costs, due to operating four rather than six bandsaws five days a week and sometimes on Saturdays, plus more capacity for lights-out running, the new machines will pay for themselves quickly."

He added that when it came to the purchase of the carbide-enabled bandsaws, there was a preconception within Langley Alloys that KASTO was the way to go, as this make of saw is used widely in the stockholding sector, especially for cost-effective cutting of high performance materials.

As the machines were needed quickly, a decision was taken to purchase the two 430 mm-capacity KASTOtec AC4 models on display in the supplier's Milton Keynes showroom.

One was fitted with a so-called carbide pack, including uprated motors to allow infinitely variable band speeds up to 50 m/min, which compares favourably with typical bimetal blade speeds of a little above 20 m/min. The other saw was a KASTO Performance Cutting (KPC) model,

designed and built specifically for cutting using TCT blades with the inclusion of patented Trum guides to minimise band vibration on the side opposite to the point of cutting.

Initially, Richard Bulmer took some Ferralium super duplex stainless-steel bar to Milton Keynes for cutting trials, as the material forms a large percentage of throughput at Langley Alloys.

Following successful tests, a purchase order was placed on KASTO for a four-week trial installation of the first bandsaw in Newcastle-under-Lyme so that further side-by-side cutting comparisons could be made with the conventional saws on site. These proved beyond doubt that the KASTOtec was ideal for processing difficult alloys, including high strength nickels, which are slow to cut using a bimetal blade. Both machines were duly installed on a permanent basis.

Since their arrival, further cost savings have accrued from reduced material wastage. Whereas the older saws are set to cut to -0, +2 mm to ensure that material length is not undersize, the KASTO machines are so accurate that they can be set to -0, +0.5 mm with confidence. In practice, they cut to within 0.1 mm. Over a



Large diameter stock being cut by Langley Alloys on one of the KASTOtec bandsaws

large batch and especially when processing expensive alloys, the saving is significant.

Another feature of the bandsaws that the stockholder appreciates is a function within the KASTO control that allows a new TCT blade to be programmed to run-in automatically at different, reduced speeds to suit the tooth pitch.

Langley Alloys, which was founded near Slough in 1938, grew steadily throughout the Second World War. Several successful alloys were developed including the high strength Naval alloy Hidurax Special and



Close-up of the control of the KPC bandsaw

the copper alloy Hidurel 5, from which engine bearings on the Spitfire aircraft were made. Even today, four of the company's 43 staff are metallurgists, able to provide customers with detailed technical guidance and support.

In recent years, the stockholder has largely reinvented itself by focusing on the distribution of bar, tube and plate in a variety of corrosion resistant alloys alongside its proprietary products.

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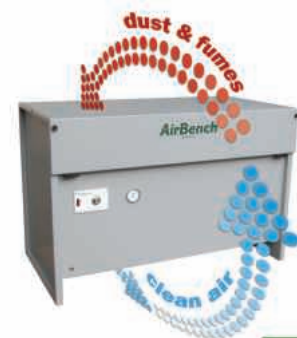
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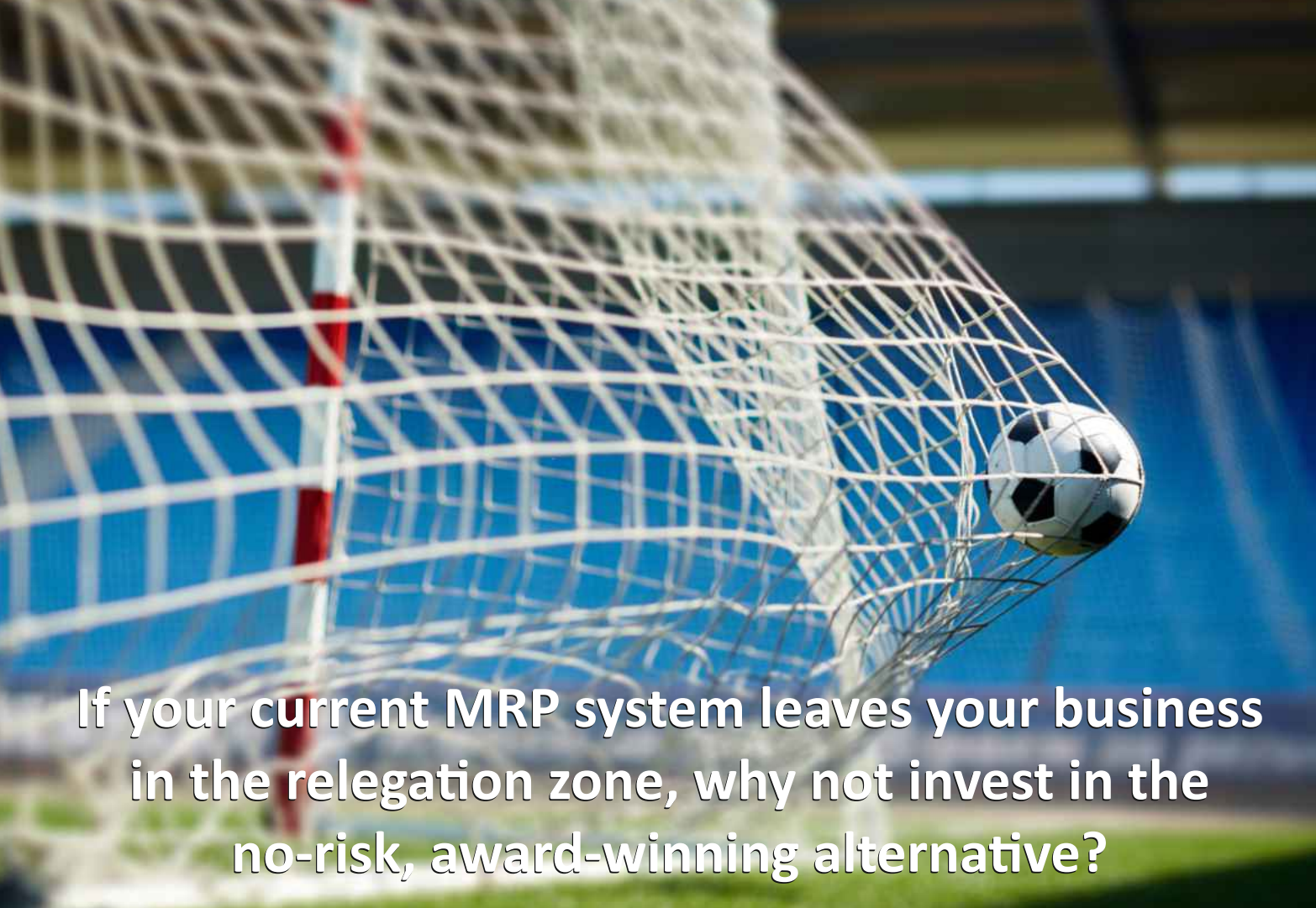
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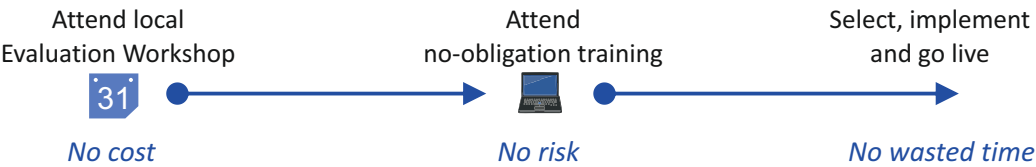
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