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XYZ travelling column machines offer affordable large capacity

XYZ Machine Tools is bringing its value engineering approach to the area of travelling column machines with the introduction of four machines with X-axis travels up to 10,000 mm, but with prices ranging between £175,000 and £275,000. This significant price advantage makes the machining of large components, particularly those found in the aerospace sector, an affordable option for many more companies.

In typical XYZ Machine Tool fashion, these new machines are designed to be highly capable, yet affordable. As standard, the XYZ travelling column machines come with the latest Siemens 828D Shopmill control, roller linear guideways for precision and performance and Gudel backlash free dual gearboxes mated with a high precision rack on the X-axis. Mounted directly under the saddle of the machine, this gearbox, in combination with the servo motor, provides smooth positioning and eliminates the vacillation



problem often found on machines of this size when the axis travel stops suddenly. The Y and Z axes are equipped with 63 mm diameter, high-speed, low-noise ballscrews.

The range covers X-axis travels of 4000 mm (XYZ 4000 TCM), 6000 mm (XYZ 6000 TCM), 8000 mm (XYZ 8000 TCM) and 10,000 mm (XYZ 10,000 TCM), with each machine sharing the same 800 mm Y-axis and 600 mm (800 mm optional) Z-axis. The standard 15 hp, BT40 spindle (BT50 optional) has a speed range of 60 to 8,000 revs/min (12,000 with cooler optional) and rapid traverse/maximum cutting feed rate is 24 m/min.

Attached to the travelling column is the 24 position automatic tool carousel (30 position optional), with capacity to accept tools up to 150 mm diameter weighing up to 7 kg. Tool change time is just 2.5 seconds. Backing up the size and performance of the machines is the solid cast construction of the base and column. This results in machine weights ranging from 18,000 kg to 34,000 kg, providing a solid foundation for high performance machining. Also, given the table sizes on these machines, the ability to split the table into multiple work zones is also an added advantage to aid productivity, with the option of a fourth axis rotary table adding further to their versatility.

The XYZ travelling column machines are an addition to the existing heavy-duty XYZ vertical machining centres that extend to 3,000 mm X-axis travel and enhance XYZ's reach into the aerospace sector, opening up opportunities in the rail, energy and construction industries. XYZ is confident that the combination of quality, specification, and price will widen the market for this type of machine.

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2nd generation mill-turn centre set to deliver a step change at Apogee Industries

Apogee Industries has been growing organically for ten years at the rate of 15-25 percent a year and is getting ready for a step change in productivity when it takes delivery of a DMG MORI NTX 1000 2nd Generation mill-turn centre after the MACH show.

From its factory based in Pewsey, Wiltshire, the company supplies complex parts to the oil & gas, aerospace, motorsport and defence industries. William Chappel, director at Apogee Industries says:

"We produce components for companies around the world, working in partnership with them to develop a lean and efficiently manufactured product. In every case we need to achieve high quality and accuracy, whether it is a single one off prototype or a production run of thousands."

Apogee Industries currently utilises 4-axis machining centres and driven tooled turning centres together with a high level of engineering input. Apogee has built a reputation for making complex, intricate and high tolerance parts in exotic materials to an exceptionally high standard. However, the current methodology requires numerous setups and many bespoke fixtures which take a considerable amount of time and skill.

William Chappel adds: "Many of the parts require between four and nine setups along with the associated jigs and fixtures for each operation. The result is an unacceptably low



William Chappel and Paul Kellett of DMG MORI at MACH

level of overall spindle run time offering very little optimisation and hence resulting in limited output. We anticipate that the increase in productivity by the implementation the NTX 1000 2nd Generation will allow an additional up time of 70 percent."

The acquisition of a laser cutting machine at its second factory helped Apogee to realise that automation and advanced

production methods could help the growth of the company and enable it to fulfil the customer's requirements while keeping all aspects of production in house. In one instance, a part that would normally be machined from solid billet was laser profiled first before being machined to its final specification. This not only reduced material wastage but dramatically reduced the production time of each part leading to a cost saving and lead time improvement. Applying this experience to machining helped the company to understand the improvements it would gain from investing in the NTX 1000 2nd Generation.

William Chappel continues: "The NTX 1000 2nd Generation will replace four ageing machines and is expected to dramatically increase spindle run time. This is where we gain critical revenue to invest in new equipment. The NTX1000 2nd Generation is scheduled to run our monthly batch requirements through the evenings while the small quantities of complex jobs can be watched and manned during the daytime. In addition to the extra machining time, savings will be made on maintenance, associated running costs and duplication of tooling packages."

The NTX 1000 2nd Generation has an



optional 65 mm through bar capacity and can throw a 430 mm diameter by 800 mm long billet. It is also equipped with an optional B-axis head rated at 20,000 rpm and a 10 station lower turret with a built in motor giving 10,000 rpm. Due to the machine's unique capabilities, Apogee is able to bring a number of processes in-house, that it would normally subcontract, from gear cutting, broaching keyways and splines to deep hole drilling and a limited amount of gun drilling thanks to the 7.0 MPa coolant pressure.

The automation comes from the addition of a bar feed and in machine travelling workpiece unloader. This will allow Apogee to run the machine lights out and unattended, without an operator having to handle components mid production, gaining an extra 60 percent of production per week.

To ensure quality, repeatability and reliability, the machine is fitted with linear scales, a Renishaw probe and tool breakage detection. This allows Apogee to probe in cycle, validate the parts, and update tool offsets automatically before removal from the machining cycle. The advanced systems can also switch to sister tooling if needed,

and ensure parts are rejected if there is a tool failure. William Chappel elaborates: "British manufacturing is based upon high technology. As a company, we should always strive to invest in the latest equipment to increase efficiency, productivity and overall value for the customer. This predominately leads to an advanced and automated manufacturing space. The NTX 1000 2nd Generation is the start of this transformation for Apogee."

Fitted with CELOS®, the NTX 1000 2nd Generation will integrate well with Apogee's existing job management system. The company will also have the CELOS PC version enabling its engineers to access drawings, images of the setup and notes and to schedule jobs from the office.

William Chappel says: "CELOS will be very important to us, as we work in a dynamic environment where we have to respond very quickly to our customers' needs and requests. It will enable us to rapidly re-tool and set up for repeat jobs. Previously, we had to take immense care on the multiple setups, produce spare parts for each operation and endure an overly high scrapage rate, but with the NTX 1000 2nd Generation, the requirements for jigs and



fixtures will be effectively removed and we will be given the ability to manufacture the precise amount of components required.

"The machine already has a full production schedule on arrival due to ongoing projects. Naturally, reliability and service will be of paramount importance and DMG MORI's transparency in service and repair times as well as the obvious build quality and precision characteristics of the machine is very reassuring."

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Javelin controls and monitors production for oil and gas specialist

With over 2,000 parts on its system and 500 works orders going through the shop floor each month, oil and gas specialist Al-Met knew that improvements were needed to its production control.

The company's sophisticated machine shop has no trouble in predominantly manufacturing components for flow control valves and assembling carbide parts onto Inconel or super duplex, thanks to a range of machine tools, including a 5-axis machining centre and 5-axis lathe, both programmed with Edgecam from Vero Software.

The Javelin production control system, also part of the Vero suite, now ensures full traceability of those high precision components, as demanded by the highly disciplined oil and gas industry. Al-Met's managing director, Phil Harmer says that when he joined the company around four years ago it was using another control system:

"It wasn't working efficiently enough for our specific needs, because we're a machine shop with a number of workstations and many orders going through the shop floor with multiple part numbers, certification and drawings. I spent two years trying to get it to work effectively for us, but it just wasn't suitable for a multi-station sophisticated machine shop."

He began researching alternatives and discovered that the company had used

Javelin's forerunner, Jobshop, in the past, but had moved away from Jobshop over to the system used by the rest of the Group.

"As a certified material environment we have a lot of certification and drawing packs to go with each works order. In some cases, we're actually printing off documents and using them on a manual tandem basis with our planning system, so there was always the risk of error. We realised that Javelin incorporated everything we need. We visited a number of local companies who were using Javelin, and the board of directors agreed that Javelin was the way forward for us."

The long-term strategy is that, once Javelin is fully implemented at Al-Met's 22,000 square foot factory in Wales, it will also be installed at the other two manufacturing plants in the Group, at Glasgow and Rotherham.

"We're working with up to 200 line items on the shop floor every day," continues Phil Harmer, "mainly components for equipment used in controlling the flow of oil and gas after drilling. Each line has a different route card and different order of operations. Javelin fully controls that, and gives us full visibility of where every job is and what stage it's at. It also shows how many hours each job takes, so we can capture all the costings as well."

A major benefit for operations manager



Craig Coomer is that Javelin has led to each user improving their productivity:

"No matter which part of the system they're on, it's so quick and easy for them to drill up and down to find the information they need about everything from material origin to costings. Starting with the Sales Order screen, they can drill through the Works Order right down to the subcontractor requirements and back the other way to see where the order came from, even to the initial enquiry and quotation."

He also finds Javelin's overall flexibility to be invaluable, allowing him to change anything he needs regarding execution of orders in terms of planning and scheduling as progress is made through the shop floor.

Amongst Al-Met's Javelin highlights, Phil Harmer refers to simple and straightforward functions like Estimating and Quotations, Sales Order Processing, and MRP: "Also, every stage of the Purchase Order is easily linked to the SO and WO and it's easy to enter information into the Scheduling function and maintain it. Colour coding makes the whole system easily visible at a glance, and schedules can be readily moved around. For instance, if there's an issue with a particular work centre, maybe because of a breakdown, or an operative is off ill, we can simply move a Works Order to another centre at the touch of a button, reset it and run Scheduling again."

While every function is vital to provide full visibility and full control over the entire process, he says Shop Floor Data Capture is at the heart of the Javelin operation:



"We have around 30 people in the machine shop working on a number of machines at different times, and they scan each operation. We can then see exactly where each component is, who's working on it, and what stage it's at. It also shows the time taken on a job, comparing it to the Sales Order and the original RFQ.

"SFDC collects information on around 35 different machining possibilities from 33 workstations. With anything up to 500 works orders going through the shop floor at any one time, we need to be able to see at a glance where everything is. Some jobs may have a lead time through the shop of a couple of weeks, and then remain static for two or three days. SFDC allows us to map where all these products are, and enables us



to print the works tool list for that particular week."

Al-Met will also be exploiting Javelin's traceability powers as it diversifies into the nuclear market.

"There are so many opportunities to attach and link documents, drawings, certificates and results at the click of a key," explains Phil Harmer. "All documentation aspects are linked to each PO and saved for future reference underneath the Sales Order and Purchase Order, which we couldn't do with the old system. To have an efficient electronic data library of every detail we need from all jobs we've worked on is a huge benefit. Javelin provides what is required as an end package for oil and gas customers. This will help us considerably as traceability is highly important to nuclear industry."

Phil Harmer points out that the staff has fully embraced Javelin, especially as many of them were frustrated with the previous system which could not cope with multi work station, multi part manufacturing with the movement of parts and part numbers.

"But it just wasn't suitable for traceability and linking different stages of the processes, work in progress and subcontract



involvement, without hours of printing and manual handling of documents.

"Our office team just can't believe how much Javelin has improved their workload and their visibility of where things are."

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Digital level bore gauge streamlines manufacture of hydraulic manifolds

The Mollart Engineering Group of companies is a precision mechanical engineering business with an international reputation in the pioneering development and building of deep hole drilling machine tools, including gun drills, deep hole boring and bore finishing.

With headquarters in Surrey and a production facility in South Wales, the Group also has a high level of expertise as a subcontract machinist and fabricator. It carries out multi-axis machining on complex, often high value components, along with part fabrication and component assembly. Mollart works across a wide sector of industries including aerospace and defence, automotive, oil and gas, subsea, mould and die, nuclear, medical, semiconductor and telecommunications.

Mollart Engineering has recently purchased a Bowers XTL digital lever bore gauge in order to measure Inconel 718 hydraulic manifolds used at extremely high pressures of 20,000 psi in the oil and gas industry. The piston bores of the Inconel manifolds have a strict size tolerance and 16 micro-inch surface finish requiring high

precision measurement to adhere to strict industry tolerances. Because the manifolds are working under extreme conditions, the surface finish and exact size of the piston bores are critical for the function and service life of the components manufactured.

Before Mollart purchased the Bowers XTL digital lever bore gauge, it was using a bore comparator to measure the size of the bores. Unfortunately the device was leaving scratches in the bore that contravened the surface requirement finish. This meant that a subsequent manufacturing operation was required after inspection to achieve the desired surface finish.

Bowers supplied Mollart Engineering with a Bowers XTL digital lever bore gauge with a 3-point spherical head. The robust lever range is perfect for the vertical bore measurement required.

The XTL Digital Lever Bore Gauge has a simple ergonomic action and can be fitted with a wide variety of analogue and digital indicators, or even transducer probes. The range can also be provided with IP65 rated digital indicators, which render the device resistant to coolant, water and airborne



particles. A 'wireless' gauge module is also available, which enables cable free communication with remote data collectors.

With a measuring range of 6-100 mm and simple 2-button operation, the XTL Digital Lever Bore Gauge is excellent for vertical bore measurement and provides fast, accurate measurement.

Bowers Group

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Large bed lathes emphasise the importance of build quality

Falling oil prices may well be having an adverse impact upon the subcontract supply chain, but Victor CNC customers are weathering the storm well due to their wise investments in the company's heavy duty Vturn turning centres.

Rochdale-based Victor CNC has witnessed considerable interest in its heavy duty line of turning centres, with interest pouring in from the power generation, oil & gas and aerospace sectors. In particular, the Vturn-40 and Vturn-45 range of slant bed CNC lathes, with bed lengths of 2.20 m, 3.25 m and 4.25 m have proven a very popular choice.

The Vturn 40 and Vturn 45 lathes both offer a huge swing over bed of 780 mm, a maximum turning diameter of 620 mm and a through bore headstock of 91 and 117.5mm respectively. These considerable dimensions are traversed at rates of up to 20 m/min, whilst flexibility can be derived from a C-axis (VDI-50 or BMT-75) or Y- and C-axis with BMT-75 turret option. The standard turret has a 10 tool capacity, while the live tooling option has a 12 station turret. The BMT-75 option also offers a 'half index' capability, effectively making it a 24 station turret. With flexibility and work envelope being two core features of the Vturn 40 and Vturn 45, another key element is the platform the machines are built upon.

From this perspective, both machines consist of a one-piece casting that demonstrates structural stiffness. This structural integrity has also been implemented in the turret carriage, which has been reinforced to deliver greater cutting performance, tool life and surface

finishes whilst conducting heavy machining.

To perform such arduous machining, Victor CNC has installed a 37 kW spindle motor with a two-stepped gearbox to generate high torque levels throughout the speed range of the spindle on the standard 2-axis model. Alternately the C and Y/C-axis variants have Direct Drive Spindle Motors of 45 kW. These enable high stock removal rates on all material types regardless of the spindle speed.

For heavy duty machining of challenging materials on a daily basis with a requirement for extreme torque levels at low speeds, the Vturn 46 has proven the machine of choice. This colossus of the Vturn series has a 4-step gearbox inside the headstock to increase cutting torque to a massive 536.4 kg/m at a low spindle speed of just 67 rpm.

To support such heavy duty machining,

the Vturn 46 incorporates box slideways with a hardness of 55HRC and a 60° slant bed with minimal distance from Z-axis ball screw to the tool tip. This combination ensures that swarf falls freely from the work area whilst rigidity is maintained throughout the machining process regardless of cutting conditions. Like the Vturn 40 and 45, the Vturn 46 is available with a C-axis spindle and a VDI live tooling turret that generates a milling power of 7 kW/2,500 rpm.



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Express invests for the future with new Mazak machine

Express Oil and Gas has made a bold statement of confidence in the future with further investment at its Gateshead facility.

The Team Valley-based company has acquired an additional Mazak INTEGREX i-400 multi-tasking machine tool, which will form part of a new manufacturing cell producing valve components for the oil and gas sector. The new machine will combine the operations of two existing machines into a single process, offering an immediate and significant production improvement.

Express Oil and Gas has a long history with Mazak and, as recently as 2014, acquired an additional number of very large multi-tasking centres, including the first INTEGREX e-800 series machine to be installed in the UK.

Neil Ransom, commercial director at Express Oil and Gas, comments: "We have a longstanding policy of continuous improvement in our manufacturing operations and are constantly analysing our production processes to reduce costs wherever possible.

"The investment in the INTERGREX multi-tasking machine will streamline our production process allowing cycle time improvements across a variety of subsea components. The efficiency benefits will enable us to remain profitable and competitive during this challenging period for the oil and gas market."



From left to right, Bill Germaney, production director at Express Oil and Gas, Neil Ransom, commercial director and Mark Ireland, area sales manager for Yamazaki Mazak in the North East

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GE Oil & Gas invests €10 m in robotics and 3D printing plant

GE is using robotic production lines and 3D printing to advance its oil and gas equipment production lines

An Italian high-tech component production centre building 3D printed burners for gas turbine combustion chambers and a robotically automated nozzle production line, form the basis of GE's new 'centre of excellence'.

The GE Oil & Gas plant in Talamona, Italy, is the first completely automated production line in the company, with the nozzle production line utilising two anthropomorphic robots capable of employing 10 different technologies, including electrical discharge machining, measurement and laser beam welding.

Production of 3D printed parts at the facility comes after extensive validation of additive manufacturing technology during the prototyping of GE's NovaLT16 gas turbine, and will be fully operational by the start of 2017.

GE Oil & Gas decided to move the technology into full production, leveraging the design enhancement capabilities, cycle time reduction and improved product quality.

"The use of automated production and new techniques like additive manufacturing allow us to develop parts and products more efficiently, precisely and cost-effectively, accelerating the speed at which we can bring product to market," says Davide Marrani, general manager, Manufacturing for Business Turbomachinery Solutions at GE Oil & Gas.

"Our investment in these technologies at this site reflects our ongoing commitment to combine cutting edge technology and new

manufacturing processes to lower cost and accelerate the innovation, speed and performance of industrial products."

GE Oil & Gas opened an additive lab in Florence, Italy in 2013 with the installation its first direct metal laser melting machine. Since then, the laboratory has grown its capabilities thanks to the addition of two further machines for the development of turbomachinery components and special alloys.

Collaborations with GE Aviation and GE Global Research Centre have significantly accelerated the development of the technology within GE.

"The opportunities for the application of additive manufacturing and 3D printing in the oil and gas industry are only just starting to be explored, and it will require an ongoing rethink of component design and production approach," says Massimiliano Cecconi, GE Oil & Gas Materials & Manufacturing Technologies executive.

"GE Oil & Gas is fostering the development of this technology to produce complex components for gas turbines, while cutting costs, boosting performance and reducing emissions."



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Where do I go for funding and how do I know what best suits my business?

Close Brothers Asset Finance's Manufacturing MD, Ian Barker provides his views on emerging trends in the engineering sector, along with the different types of finance available

The UK has a proud engineering heritage, from Brunel to Barnes Wallace and James Dyson today. Many of the projects, past and present, are world-leading both in their scope and ambition. You only have to look at the Channel Tunnel and Crossrail where the tunnel boring machines have, literally, redefined what is possible in urban engineering.

Those big ticket projects are vital in attracting new talent to the sector, but it's at the SME level where the majority of the activity actually happens. It's worth reminding ourselves just how important we are to the UK economy because it can be easy to lose sight of this when you work in the engineering sector day in and day out.

According to the Engineering UK 2016 'state of engineering' report, in 2014, the total number of registered engineering enterprises grew by 5.6 percent to 608,920, with 80 percent of those employing no more than four people. Just 0.4 percent of all engineering enterprises employed more than 250 people. Yet, between them, these companies employed 42.4 percent of those working for an engineering enterprise.

Our sector is also a key contributor to boosting the UK's productivity, generating £455.6 billion GDP for the UK. It employed 5,529,000 people (two thirds of whom are practising engineers and technicians) and supported 14.5 million jobs in the UK.

To give this context, for every new job created in engineering, two more jobs are created elsewhere in the UK. If engineering can meet the forecasted demand for new vacancies, it would generate an additional £27 billion GDP per year: the equivalent of building 1,800 new secondary schools or 110 new hospitals.

In effect, a growing engineering base results in a more productive economy, because the sector produces the majority of the UK's exports and invests significant sums in research & development and innovation. That said, Richard France, Sheffield Engineering Leadership Academy manager at the University of Sheffield, said in a recent article in The Guardian that more needs to

be done to incentivise our most promising engineering graduates to become the academics of the future.

Recent analysis from the Institute for Public Policy Research (IPPR) supports the case for the creation of an economy built on a growing engineering base. The research concluded that the key to restoring productivity growth is to shift job-creation towards higher-productivity sectors, while encouraging firms to invest more to boost the productivity of their existing workforces.

The question many firms will be asking is: 'Where do I go for the funding and how do I know what best suits my business?'



Close Brothers Asset Finance has been supporting the engineering industry at the SME level for many years through all the economic cycles and not only during periods of growth. Who can forget how badly the sector fared during the recession, when output in the sector fell dramatically and faster than the whole economy in 2008?

It was during that time that Close Brothers' specialist knowledge of engineering equipment finance and understanding of the challenges facing the engineering industry came to the fore, using that expertise to assist businesses in the right way through sensible lending practices.

We have a team of dedicated experts, most of who have first-hand experience of the engineering industry and understand the pressures the industry faces. It's difficult



Close Brothers Asset Finance's Manufacturing managing director, Ian Barker

to overstate the value this brings because it's one thing to have access to finance, but having a structured deal suited to your individual needs is completely different because, for one, it gives you peace of mind that your assets are secure and won't be repossessed by a funder who has limited awareness of how the industry works.

As an example, we understand that some businesses operate seasonally and have the attendant fluctuations of cash flow, and, as we all know, it's one of the key indicators of a business's health. We use asset finance as a mechanism to ensure it's not a barrier to growth.

Our message to our customers is that asset finance is far more flexible than a standard bank loan or overdraft. The repayments are spread over an agreed term, and can be structured to correlate with the income generated by the asset.

Looking specifically at the engineering arena, we have found that refinancing works particularly well, most notably when businesses need a cash injection. In effect, refinancing is a quick way to access the value

of assets on your existing balance sheet and redeploy that value elsewhere within your business, for example, to fund a deposit on new equipment or unlock some working capital to ease cash flow.

Getting a little more detailed, Sale and HP Back is a form of refinance that can be used against most types of equipment, making it suitable for companies of all sizes, including sole traders. It works by us purchasing the asset and financing it back to you. Repayments are calculated in line with the income stream that will be generated by the asset and at the end of the refinance term, you own the asset. This option applies whether you already own the asset or are using it under a finance deal with another provider.

The reason refinancing works in our sector is because of the low depreciation of engineering assets and the increasing longevity of machine thanks to, basically, better engineering. These factors allow us to refinance the kit and consequently help businesses retain cash just when they need it to spend on, for example, investing in their people or expansion.

An area where Close Brothers Asset Finance has excelled is the Regional Growth Fund (RGF), where our distribution model has been hailed as an example of best practice. RGF is a £3.2 bn fund which awards grants to small and medium sized businesses with the aim of supporting private sector investment, creating

economic growth and sustainable employment across the UK. To qualify for RGF support an SME must commit to either recruiting new employees or safeguarding existing jobs.

We're very proud of what we've achieved through the 'Close Brothers RGF Asset Purchase Scheme', which we created in 2011. This scheme enables qualifying businesses to receive a grant towards a deposit on new business assets, of up to 20 percent of the value of the investment, dependent on the size of the business and number of jobs being created or safeguarded.

To date, we've received a total of £70 million from this government-backed fund, which has supported SME investment across a number of industries in the UK, including engineering. Using machine tools as an example, we financed 804 assets, with a total asset cost of £108,638,865 creating 1720 jobs and safeguarding a further 752.

Another scheme that demonstrates our commitment to the engineering sector is our SME apprenticeship programme. With the support of the University of Sheffield AMRC Training Centre and the Manufacturing Technologies Association (MTA), the programme helps SMEs recruit and train a new generation of advanced engineering workers. Under the scheme, Close Brothers is helping pay for 20 apprentices to learn their skills at the AMRC Training Centre. Close Brothers is funding

half of the new recruits' wages during the first year and a quarter in the second, meaning participating SMEs don't have to bear the full cost of employing the apprentices until they are making a positive contribution to their business. The first intake was in September 2015.

The objective is to recruit a further 20 apprentices in year two and 20 more in year three, meaning Close Brothers will be supporting up to 60 apprentices in the scheme at full capacity in what is a banking first.

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Marine equipment manufacturer takes the plunge

Miyano helps Apeks' dive into cost reduction programme with assured safety critical quality

In just eight weeks, following the installation of a Miyano BNE-51MSY turn-mill centre, Blackburn-based scuba-diving specialist Apeks Marine Equipment recorded savings of almost £4,000 on production costs against its original well-proven, turn-milling methods. The company has also halved setting times and is now able to include the finishing of a critical sealing feature within the Miyano cycle on two safety-critical regulator valve components which were previously run as separate operations.

It was sourced from Citizen Machinery UK, following some four months of in-depth scrutinisation that initially involved four competing machine suppliers with equipment having similar capabilities.

Machine Shop supervisor Stuart Davis says: "Each supplier was charged to provide cycle times and changeover times for two very complex multi-featured breathing apparatus components. This was followed by a presentation and discussion of pertinent advantages from their specifications followed by a turnkey project price.

"Our decision favoured the Miyano presentation and so we moved into the second phase when Citizen was provided with a part drawing, tooling sheet and



The Miyano BNE-51MSY is tooled to produce safety-critical regulator components at Apeks Marine Equipment

program from the existing turn-mill machine and had to set a BNE-51MSY at Citizen's Bushey headquarters for final production prove-out trials.

"Although we have seven Citizen CNC

sliding head machines installed since 1998, with the last two, an A32-VII in 2012 and A20-VIPL in 2013, we were totally open in our investigations. We had to be totally dedicated to install the best performing and accurate machine to effectively produce our parts which have to be strictly controlled as they are safety critical."

Apeks was originally conceived in the 1970s, using the names of its founders Ken Smith Ainscough and Eric Partington, both keen divers and precision engineers, working from a small garage in the north of England. Apeks now employs 150 people and is part of Aqua Lung International, with some 30,000 scuba-diving regulator units plus bladders, instruments and a wide range of accessories sold to 50 countries.

The decision to install the new Miyano was made to replace existing machines and especially the capability to combine operations on a range of CZ121 brass components into a single cycle. These included the finishing of a critical valve seating to 0.2 micro metres CLA, having to maintain 0.05 mm tolerance on key porting depths, 0.02 mm tolerance on a special internal radii which also has a 0.04 mm positional tolerance taken from a 45 degree



Production savings of almost £4,000 have been made in just eight weeks on both types of port bodies produced in single cycles on the Miyano BNE-51MSY at Apeks Marine Equipment

angle intersection point and the ability to hold various concentricity requirements within 0.08 mm TIR.

Stuart Davis says: "The Miyano runs from 6 am to 10 pm Monday to Thursday and on Friday between 6 am and 7 pm and to date has never missed a beat. The control is very familiar to us, as it is similar to the Citizen A32 we installed in 2012. This helps with operator familiarity and has the advantage of very fast data processing. We are able to use the highly flexible and time saving overlapping capability in the production cycle and being able to set up to three tools simultaneously in cut, this creates major advantage in cycle time reduction."

He then describes a four port regulator body which formed part of the trial:

"We have seen setting times reduced from four hours to just two. Set to run batches of 1,000 parts, the cycle time has been reduced from 4.93 min to just 2.9 min and by using 28 tools mounted on both the 12 station turrets with the help of some special holders."

The port body, which regulates air from the tank, is made from 42 mm diameter brass and is 45 mm long. It includes the production of features such as bores from the front face of 38 and 30 mm diameter plus undercuts, and grooves, chamfers and a M38 x1.5p thread. A hole is drilled through 3.5 mm diameter and a 45 degree angular form created in the bottom of the bore with a 2 mm outside radius. Four slots are also milled in a cross form 3.48 / 3.52 mm

diameter in the centre section at the bottom of the bore. Two 2.5 mm diameter holes are drilled 41 mm deep with a flat bottom to break into two of three port holes that are produced from the outside diameter.

From the opposite end, stepped bores of 18, 14 and 11 mm are drilled and a 1.5 mm wide undercut and two, 3.5 bullnose forms created 1.4 mm deep on centre and at 90 degree to each other. Also, a critical 0.3 to 0.5 mm radius 0.08 / 0.12 mm from a 45 degree form is generated at the bottom of the bore.

Two connector ports are radially drilled, counterbored and tapped 3/8 UNF from the outside diameter, and a third 7/16 UNF port with a 1 mm breakthrough to the central bore is produced. Each part is then individually engraved with consecutive serial numbers to confirm the month and year of manufacture plus CE and EN number marking.

The second port body has similar tight geometric and surface finish requirements and now in production, is produced in 2.9 min, creating a saving of 51 sec per part. Also, a handwheel has recently been tooled up, for which over 24,000 are required a year and this will now be produced 20 percent faster than before in 1.9 min.

The advantage of the 8-axis Miyano BNE-51MSY is its rigidity with a single piece bed casting having scraped square guideways adding to stability and repeatability. Also, this construction enables full advantage to be taken of the working



Apex Marine Equipment has a worldwide reputation with diving enthusiasts, professional divers, the military and emergency services

combination of the 15 kW, main and 7.5 kW secondary spindle both capable of delivering 6,000 revs/min.

The two high rigidity 12 station, all-driven turrets have 2.2 kW motors developing 20 Nm of torque and 6,000 revs/min and can be programmed to cut with up to three tools simultaneously creating a significant advantage in cycle time reduction.

Adding to the machine's flexibility, overlapped machining can be carried out on both end faces of parts, such as drilling with the main turret, which has three axes X1, Z1 and Y1 at the main spindle, while the second spindle simultaneously feeds forward with two axes (X3 and Z3). In addition, the second two-axis turret (X2 and Z2) can be engaged to produce an outside feature at either the main or second spindle.

Stuart Davis concludes: "Without doubt, the Miyano specification and build ticked all our boxes and was mid-range on price against the other machine suppliers. What it has done is to contribute to our drive to achieve cost-down but at the same time, assured us of machining a quality product that meets our strict safety demands."

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Stuart Davis (left) Machine Shop supervisor with Mick Thomas-Fisher, CNC setter with the Miyano BNE-51MSY turn-mill centre at Apeks Marine Equipment

XYZ gives Renishaw Greenpower a boost

Research and development is the lifeblood of Renishaw and backing this up are a number of small workshops across the group capable of manufacturing one-off and low volume prototype parts. The majority of these workshops are now equipped with machines from XYZ Machine Tools, as the ProtoTRAK control system suits Renishaw's needs perfectly.

The first workshop to convert to XYZ is located at Renishaw's New Mills UK headquarters and is managed by Tristan Dover: "When we started to get increased demand for machining it was obvious our old manual machines couldn't cope, even though we were only ever asked to produce one-off or two-off parts. I suggested that we look at CNC machinery, then I saw XYZ and the ProtoTRAK control at an exhibition and I liked what I saw. The combination of manual and CNC was the ideal solution, as some of the people running the machines would take some convincing that CNC could produce parts as quickly as a manual turner/miller. The ProtoTRAK control quickly converted these dyed-in-the-wool machinists to the benefits of CNC."

Initially Tristan Dover was planning just to purchase a Prototurn SLX 1630 lathe, but when he sat down and put together his justification it became obvious that the value for money presented by XYZ made it possible to replace both the lathe and mill, so an XYZ SMX 2500 bed mill was ordered at the same time.

Both machines are equipped with the ProtoTRAK control, which features simple, plain English conversational programming that helped to make the step from purely manual machines to CNC very straightforward at Renishaw.

"We find the ProtoTRAK control extremely efficient, especially on one-off parts where we can save considerable time compared to manually machining them," says Tristan Dover. "You can program tapers, radii, and other forms, which totally eliminates the need for special form tools. Such is the ease-of-use, that now even our most ardent manual machinists are using the control to program parts."

Word of the ease-of-use of these XYZ machines quickly spread within the Renishaw group and now various machining workshops around the group's UK facilities have bought in to the ProtoTRAK way of working, with an additional six XYZ machines being installed.

As part of its corporate support for the Greenpower initiative, which combines STEM subjects (science, technology, engineering and mathematics) with electric-powered car racing, Renishaw also makes its workshop available to its engineers involved with the project. Greenpower targets engineering students/apprentices aged between 18 and 24, with



The XYZ SMX 2500 has been used to create intricate moulds for the Renishaw Greenpower race cars

support provided by more experienced engineers within the company. One of these is design engineer Jamie Boden, who makes regular use of the XYZ ProTurn SLX 1630 and SMX 2500 to manufacture parts for the race cars.

In using the two XYZ machines the Renishaw Greenpower team make use of all of the available capacity, which in the case of the SMX 2500 is a 2.2 kW spindle with a speed range of between 50 and 3,600 revs/min over two speed ranges. The machine table measures 1,245 mm by 228 mm and the spindle head is able to tilt 45 degrees either side of vertical. The ProTurn SLX 1630 lathe is a ProtoTRAK controlled lathe in the XYZ with an impressive specification. Swing over the bed is 400 mm and has a between centre distance of 760 mm. The 5.75 kW, 2,500 revs/min, spindle accommodates a 200 mm three-jaw chuck. As already mentioned, both machines make use of the ProtoTRAK control system, with the turning and milling controls featuring identical programming



Tristan Dover operating the XYZ ProTurn SLX 1630



Complex turning and milling has been undertaken on the XYZ machines to improve the performance of the Renishaw Greenpower cars

languages and systems. This makes switching from one machine to another a seamless operation.

"We work with our first-year apprentices who are given real jobs to machine on the XYZ machines with the intention of making the standard kit car both faster and more efficient, says Jamie Bowden. "The races are endurance events over one hour and we have to maximise the output of the standard battery we are given. We achieve this by designing and machining new parts."

Parts are varied for the project and range from intricate finned casing for the electric motor to foam moulds for an aerodynamic



More turned components off the XYZ ProTurn SLX 1630



One of the finished Renishaw Greenpower race cars

helmet fairing and the car's nose cone, which were left to be machined unmanned on the XYZ SMX 2500.

A time-lapse video of the nose cone mould being machined is available on the XYZ website at:

www.xyzmachinetools.com/xyz-gives-renishaw-greenpower-a-boost/

Greenpower is a great way to generate interest in manufacturing among primary and secondary schools, young apprentices and engineering students. Renishaw's corporate entry not only supports the three race cars under its name, but also provides support to other teams.

"We have a lot of high end technology on

site here at New Mills," says Jamie Bowden, "but we try wherever possible not to use advanced processes in developing our cars, processes that would not be available to other teams. This is where the XYZ machines play a part as they are readily available to many colleges and other engineering companies. By using them ourselves we are keeping a balance in terms of technology."

Renishaw entered three teams into the Greenpower challenge in 2015 and was crowned F24+ champions that year, as well as winning the corporate challenge event. Three more cars will be entered in 2016 with ongoing development work, much as in Formula One, taking place to try to maintain that competitive advantage. The XYZ machines will be at the forefront of ensuring all machined parts deliver improvements.

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Multi-functional machining centre performs 4-axis turning

GF Machining Solutions, the milling, EDM and laser texturing machine tool manufacturer and supplier of automation system solutions, has strengthened its machine tool range with the introduction of the new, Swiss-made Mikron MILL P 800 U (Simultaneous Turning) ST, a machine that provides customers with high-productivity, high-efficiency milling and turning capabilities

GF Machining Solutions, widely respected and recognised for its innovative machine tool solutions, has developed the gantry-type MILL P 800 U ST machine specifically for small and medium-sized precision component manufacturers looking to improve their productivity by getting more out of their machine tool investments.

By combining two technologies (milling and turning) in one machine, the compact MILL P 800 U ST, with its 3.5 m x 3.0 m footprint, is inherently versatile and its size



The MILL P 800 U is automation-ready and can be supplied with pallet changers configured to handle two, seven, nine or 12 pallets

effectively delivers more productivity per square metre of production space.

Although the MILL P 800 U ST is classed as being 'compact', the machine has an impressive 800 mm X-axis travel, an 800 rpm C-axis rotation speed and a maximum table load of 800 kg.

The ability to access milling and turning technologies in one machine helps make manufacturers more efficient.

Production bottlenecks and job setup and cycle times are reduced because the machining of parts like compressor housings for aircraft, which require both turning and milling technologies to be employed to produce completed parts, can be machined in one hit. Being able to fully machine components on a single machine also eliminates transfer-related part run-out and errors.

The MILL P 800 U ST is capable of 4-axis simultaneous turning and incorporates a 20,000-rpm HSK T63 spindle.

Additionally, water-cooled torque motors on the A- and C axes ensure accuracy and stability, while speed is enhanced through the axes' 0.3 sec clamp time in any position.

The machine's gantry design enables full accessibility of the workpiece on its 800 mm x 800 mm table without having to rotate it. This facility eliminates errors related to table rotation and improves part quality and finish

thereby negating the need for hand polishing.

The tool changer for the machine is also optimally located so as to avoid moving the table during tool changes.

Machine and Spindle Protection (MSP) adds further security to the machining process by protecting the machine and spindle against crashing during set-up and



The Mikron MILL P 800 U ST machine in action

machining operations. Additionally, the machine is automation-ready and can be supplied with pallet changers configured to handle two, seven, nine or 12 pallets. It can also be easily integrated into existing automation systems, including System 3R automation solutions.

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The new Mikron MILL P 800 U (Simultaneous Turning) ST machine

means it is easy to install and integrate into most production environments. Furthermore, because the MILL P 800 U ST can effectively do the job of two machines, it

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Rental scheme is SMART

Mills CNC's 'SMART Options' rental initiative is aimed at UK and Ireland precision manufacturers looking to increase and improve their machine tool capacity, without being tied to any long-term purchase agreement.

The refreshed and relaunched 'SMART Options' rental scheme, available on all new Doosan machines supplied from stock by Mills, is administered and managed by Mills CNC Finance, the company's independently operated machine tool finance arm.

Mills CNC Finance manager, Ian Barber says: "We expect that the majority of our 'SMART Options' rental business will be as it was previously with SME's, although the scheme is of course open to larger OEM-type companies too.

"We have reintroduced 'SMART Options' because we have found that, although many component manufacturers are busy and expect to be so certainly in the short-to-medium term and that they need additional machine tool capacity and capabilities to cope with the work currently in their order books, there are a number of market issues, such as the impending European Referendum, that are affecting business confidence and are leading to Capex investment plans being put on hold.

"As a consequence some companies are reticent about saddling themselves with what they consider to be long-term financial commitments caused by investing in a new machine tool via a bank loan or via traditional hire purchase or operating lease arrangements."

In contrast, the flexible SMART Options rental scheme is designed to bridge the gap between manufacturers needing access to high-performance machining capability and capacity on one hand but not wanting to 'break the bank' acquiring it on the other.

The SMART Options rental scheme has a number of elements. The first of these is that the rental period for a new Doosan machine must be for 12 months, in the first instance. Although towards the end of the 12 month period manufacturers have a number of options open to them including: return the Doosan machine to Mills CNC; extend the rental period for a further 12 months; buy the machine and get 100 percent of the rental payments made refunded against the original price of the machine.

Ian Barber continues: "SMART Options gives manufacturers much needed breathing space to be able to focus and improve their performance in the short-term without being distracted by what may or may not happen in the future.

"Furthermore, SMART Options' rental payments are highly-competitive and, as a consequence, offer attractive offering low rates to manufacturers."

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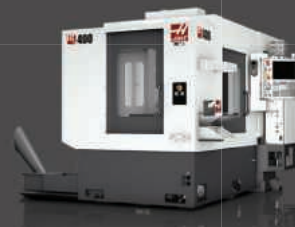
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Sodick VZ300L achieves 30 percent faster wire EDM cycles

March Precision Engineering Ltd, a leading subcontract machining and manufacturing specialist based in Aldershot, is using its recently acquired Sodick VZ300L CNC wire EDM to achieve 30 percent faster cycles and better surface finishes than the model it replaced. Supplied and installed by Sodi-Tech EDM, the new machine ensures the company has complete control over its manufacturing and quality processes.

UKAS and ISO9001 approved, March Precision was established in 2002 with little more than one lathe and one milling machine. Today the company has grown to offer its engineering processes to a wide range of clients using a plethora of the latest CNC machine tool technology, which now includes gear cutting, 3D printing and wire EDM.

"We had an older Sodick wire EDM that gave great service over the years, prompting us to buy Sodick again," explains managing director Mike Vincent. "We were aware that upgrading to a new model would bring a number of technology-related advantages, such as automatic wire feed, which we knew would save time."

Due to demand and growth, March Precision moved to its current, larger premises in 2006. In fact, the eight employee company added the neighbouring unit to its available floor space in 2014. Today, industries served include oil and gas, motorsport, aerospace, defence, automotive, science and retail, largely to customers within a 50 mile radius. March



Precision supplies everything from prototype development jobs through to large batch production components. However, current typical batch sizes on the new Sodick VZ300L are in the region of 1-10-off.

"To be honest, we manage to keep the machine busy without actually promoting the fact that we offer a wire EDM service," says Mike Vincent. "Most of the work for the machine arrives off the back of milling and turning jobs. Moving forward we are looking to change that, letting people know that a new wire EDM is available in the area to help customers with their precision engineering projects."

The Sodick VZ300L is equipped with linear motors and a 10-year accuracy guarantee as standard. The machine achieves outstanding levels of accuracy, surface finish and cutting speeds thanks to its high performance LN2W generator. This specific model was selected by March Precision as it offered a similar working envelope to the machine it replaced, accommodating workpieces with dimensions up to 780 by 570 by 215 mm, and up to 500 kg in weight. The machine also offers 80 by 80 mm U/V-axis travel and $\pm 15^\circ$ taper angle capability.

"We had a demonstration of the VZ300L at Sodi-Tech's facility in Coventry and the machine sold itself," says Mike Vincent. "It was installed last summer and has been put to work producing a variety of sometimes

complex components from materials that include titanium, 17-4 stainless steel and various exotic alloys, typically for Formula One and oil and gas customers. I would estimate that it is around 30 percent faster than our previous machine, which will help achieve a quick return on our investment. Having automatic wire feed also helps to save time, while surface finish is improved too."

Sodi-Tech has already trained one operator at March Precision on the new VZ300L, with another currently in the process.

"We had great service from Sodi-Tech on our previous machine, which was another reason for returning to them for our latest investment," concludes Mike Vincent.

"Having wire EDM in-house gives us full control over our manufacturing process and the quality we achieve. It also means we can offer a complete component manufacturing service, whereas some of our competitors have to subcontract their wire EDM requirements."

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Sodick technology installed at March Precision

Victor opens a labyrinth of possibilities with new turning centre

Victor CNC has now introduced its Vturn P20 range of slant bed turning centres. In this latest line of machines, Victor has not only enhanced the structure of the Vturn P-series lathes with an improved slant bed and turret design, but has also upgraded the rapid feed rates in order to improve productivity.

The result for the end user is an extremely high powered spindle that is built upon a remarkably rigid construction. For example, the new Vturn P20 has a 15 kW spindle motor for heavy material removal rates. To constitute such heavy material removal rates, the Vturn P20 has double roller bearings and angular thrust bearings that absorb axial cutting forces. Furthermore, the spindle cover is designed with a four layered labyrinth seal to protect the spindle bearings. All this is encased in a heavily ribbed headstock that enforces the spindle performance whilst demonstrating unparalleled heat dissipation.

The robust build of the spindle and headstock is mirrored in the single piece Meehanite bed casting that equally distributes stress throughout the structure.



Furthermore, the Z-axis ballscrew is mounted on the slant bed and not the machine base. This minimises the distance from the turret to the ballscrew, which improves cutting stiffness and rigidity. The result is impeccable surface finishes and prolonged tool life, regardless of the material machined or cutting parameters.

From a capacity perspective, the Vturn P20 has a swing over bed diameter capacity of 520 mm with a maximum turning diameter of 280 mm. The spindle bore permits barfeeding up to 52 mm (66 mm for Large Spindle Bore option) with an impressive 440 mm between centres. To support the machining of such component diameters, the Vturn P20 has an X-axis travel

of 20+140 mm and a Z-axis traverse of 370 mm, which are swiftly covered by 30m/min rapid rates.

The tool turret on the Vturn P20 can hold 10 tools with a shank size of 25 mm diameter. In addition, a VDI-30 configuration can be specified as a no cost option. The spacious work area permits the use of such large capacity tools whilst delivering a comprehensive component capacity size.

As with all Victor CNC machine tools, the list of standard features is comprehensive. On the Vturn P20 these options include a hydraulic chuck with soft and hard jaws, manually positioned tailstock with programmable power quill and tailstock centre, chip conveyor and cart, fully enclosed splash guarding, handwheel, toolholders, coolant flush on Z-axis cover and 3-step warning lights.

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Big as a house in Brighouse

Halifax Rack and Screw, is a world leader in the manufacture and supply of high quality precision engineered gear racks, lead screws, pinions, nuts and complete mechanical power transmission systems from its 30,000 sq. ft. purpose built manufacturing facility in West Yorkshire, UK.

Based in Brighouse, HRS was established in 1953 and currently employs over 40 people. The company is considered Europe's largest specialist manufacture and supplier of gear rack, pinions and screws.

Whilst initially founded to serve the precision machine tool industry, the successful diversification into many other industrial sectors together with a strategy of capital investment of over £2 m in new CNC machinery, computer technology and training, HRS has seen continuous growth with exports worldwide now achieving over 50 percent of turnover. Part of that investment has been the installation of a Haas VF-12 50-taper vertical machining centre.

The VF-12/50 vertical machining centre easily accommodates the large-volume

machining found in the aerospace, automotive and mould and die industries. The massive machine features travels of 3,810 x 813 x 762 mm (xyz) and has a 3,810 x 711 mm T-slot table. Standard equipment includes a side-mount tool changer, chip auger system, programmable coolant nozzle, rigid tapping, 95-gallon flood coolant system, 15" colour LCD monitor with USB port and much more.

The Haas vertical is equipped with a 30 hp vector drive spindle that spins to 7,500 rpm and provides 75 ft/lb of torque. A 24+1 tool side-mount tool changer is standard, with a 40+1 tool side-mount optional. A 10,000 rpm spindle is available for high-speed work, and a two-speed geared-head spindle that yields 250 ft-lb of torque is available in both 7,500 rpm and 10,000 rpm configurations.

Its massive cast-iron construction, triangulated wide-stance castings and heavy-duty outriggers prevent flex and



damp vibration to provide high accuracy and consistent repeatability. Linear (glass) scales are available as an option for extremely precise positioning. Other high-productivity options include high-pressure through-spindle coolant, 4th- and 5th-axis drives, high-speed machining software, a wireless intuitive probing system and much more.

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Aerospace customers look to Premier for complete machining solutions

Premier Deep Hole Drilling is one of the UK's largest providers of specialist deep hole drilling, gun drilling and honing services. Although renowned for providing these services, the St. Albans-based company reports it now completely machines many more components, with around half of the current turnover generated by its machining centres and multi axis mill-turn machines.

Civil and defence aerospace components account for 70 percent of the company's business. Engine, nacelle and actuation system components are fully machined and supplied directly to the customers' assembly operations in the UK and across the globe.

As well as current aircraft programmes, such as the Airbus A350XWB, A320neo and A400M, Premier also provides ongoing machining support for legacy products like the Rolls-Royce engine range.

Managing director, Stuart Grant says: "Produced from stainless steel, actuation work has ramped up, moving from development to flight approval and into production volume phases, to match the demand from the OEM. They are designed and produced to extremely tight tolerances, with the complex geometry at each end of the hollow component tied up tightly.

"As such, they are not easy to produce. We have to remove so much metal out of the middle. They are long, thin walled and have tolerances of 0.1 mm on length and 20 micron on concentricity between one end



and the other. Wall thickness is minimised for weight saving. Some of the legacy components we produce have a wall thickness of 3 mm or more. The new components have a wall thickness of between 1.6 and 1.8 mm. It is a rare skill set required to produce these components consistently and on-time and we are very proud our customers trust us with such work."

To support the increased demand for complete machined components, the company purchased a second long bed Doosan Puma 3100XLY mill-turn machine with 2.1 m capacity between centres at MACH last year.

"The mill-turn machine can hold the tolerance required and we specified it with a programmable steady to minimise the deflection of the part during machining and

we have even managed to eliminate some grinding operations" explains Stuart Grant.

Most of the actuation and engine mounting components are produced from 15-5 stainless steel, precipitation hardening stainless steels that contain chromium and nickel to provide an optimum combination of the properties of martensitic (gain high strength through heat treatment) and austenitic (corrosion resistance) grades.

"Cutting speeds are critical as growth, shrinkage and distortion can all cause greater variance than tolerances allowed. We work closely with suppliers and customers during development of designs and production methods," explains Stuart Grant.

For the defence sector, Premier is producing fuel delivery nozzles for the TP400-D6. A collaborative engine project for the A400M military transporter, partners include Rolls-Royce, MTU, Snecma and ITP. The fuel nozzle components are machined from 718 Inconel and S130, both of which are difficult to machine materials.

Stuart Grant says: "S130 is a chrome-nickel steel stabilised by the addition of niobium to overcome inter-granular corrosion common to other stainless grades after exposure to temperatures over 430 °C. While age-hardened Inconel 718 has to be machined using an aggressive, but slow cut with a hard tool, minimising the number of passes required. We have been doing the job for a number of years as the engine has progressed from design to testing, and it is now ramping up to production volume."



The company's ongoing investment in its full machining capability is leading to increased demand as customers gain an understanding of what Premier can do.

"Today, we produce fully machined spare nozzles for a range of Rolls-Royce high-bypass turbofan engines. Initially we provided a drilled blank, however our machining capacity and capability has grown so now we provide a finished component to the customer," adds Stuart Grant.

He concludes: "Most of our machining is carried out on components which include deep bores as carrying out all machining in house offers a cost saving solution. Most parts we produce for the aerospace industry are drilled and honed as the supply chain is subject to a tighter than standard finish. All our work is carried out to Aerospace AS9100 standards no matter what industry the work is for. For the future we will continue to invest in increasing our capability as demanded by our customers, while continuing to provide our core drilling and honing service many customers still require."

Premier is a leading deep hole drilling, honing and precision machining specialist.



From its 30,000 ft² facility in St. Albans, the company provides a one stop shop service for customers in a wide spectrum of industry sectors, including aerospace, motorsport, offshore, medical and general engineering. Accredited to industry leading quality standards such as BS EN ISO 9002 and AS9100, Premier also offers supplementary services, including materials sourcing and

procurement, project management, component stocking, and control of specialist services such as heat and surface treatment.

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Mollart is gunning for you

Botek's 'Lite-Cut' gundrill geometry requires 30 percent less power giving higher penetration rates

Aptly named 'Lite-Cut', a new series of gundrills from drilling specialist Botek incorporates a conical chipbreaker form and a special nose-grind that requires 30 percent less power, enables higher penetration rates especially in more difficult materials and by creating shorter, more compact chip forms, means swarf can be more easily evacuated from the hole using lower pressure coolant.

Available through sole UK supplier Mollart Engineering of Chessington, Lite-Cut gundrills are available in a single flute brazed tool, Type 110 and solid carbide Type 113. Type 110's brazed solid carbide tip is available in diameters between 1.85 mm and 51.2 mm while Type 113 incorporates a kidney shaped coolant channel with a diameter range of 1.5 mm to 12 mm.

Type 110 also incorporates brazed carbide bearing pads which, in conjunction with generated cutting forces, pressurises the pads against the wall of the drilled hole to support the cut and create a burnishing effect giving a high surface finish. The drill head tube is brazed to a hardened and ground steel driver. Drill sizes between 1.85 mm and 7.059 mm have a single

coolant feed hole while tool sizes 7.06 mm to 51.2 mm have twin coolant feed holes. Holes up to 40:1 depth-to-diameter ratio can be drilled in a single pass.

Type 113, with its kidney-shaped coolant feed channel, enables optimised flow into the cutting zone. The higher rigidity of the solid carbide tip of the tool and tube reduces any torsional generated vibration and flexing of the drill during the high speed penetration of the material. Type 113 drills are available for holes up to 100:1 single pass, depth-to-diameter ratios.

Mollart to showcase knee-type multi-spindle gundrilling machine at IMTS 2016

Such was the level of success achieved by Mollart Engineering and Mollart America's presence at IMTS 2014 in Chicago, that show enquiries led to orders exceeding \$10 million for special purpose gundrilling machines for producing oil galleries in transmission shafts for 9- and 10- speed automatic gearboxes for the North American market.

The machine on stand S-9290 at IMTS 2016 will be the latest development of this machining concept incorporating a full Fanuc 35i control and drives package.

Sales director Ian Petitt says: "We worked extremely hard to win this contract in 2014 against stiff international competition. However, we had extensive help in the project from Mike Tanasescu, technical sales manager based in Toronto and tooling development by Botek of its special HP solid carbide drills. Botek is a strategic tooling partner of Mollart."

The contract involves a mixture of four and six spindle gundrilling machines built at Mollart's Chessington, UK headquarters with parts manufactured in its subcontract facility. Meanwhile, the bespoke coolant and filtration systems are fabricated and assembled at the Resolven subcontract production facility in South Wales, UK.



Mollart's multi-spindle special purpose gundrill in build for North American customers due to conical chipbreaker and special nose grind



The new series of 'Lite-Cut' Botek gundrills from available from Mollart requires 30 percent less power



Mollart will be exhibiting at: IMTS, McCormick Place, Chicago from 12-17 September 2016 on Stand No: S-9290

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Ultra-small CBN tools for 2.5 mm bores in hard material

Ultra-small holes as fine as 2.5 mm diameter in hardened materials can be finish bored and faced using the advantage of Sumiboron cubic boron nitride (CBN) tools following the development by Sumitomo Electric Hardmetal of its BSME and SEXC series of boring bar tooling.

CBN has the advantage when turning hardened, tough and cast materials in allowing engineers to take the process into higher performance areas where carbide tools just cannot be applied. Not only does CBN offer greater levels of consistency, it also gives a precise predictability of in-cut life with the ability to maintain high levels of accuracy and precision over long periods.

The BSME tool has a brazed CBN cutting edge on a carbide tool shank, which creates added stiffness, for bore sizes between 2.5 mm diameter by up to 5.3 mm deep to 5 mm by 20.3 mm deep.

Meanwhile, the SEXC version utilises a two-corner, indexable CBN insert able to machine bores from 4 mm diameter by 8 mm in depth to 6 mm diameter by 18 mm deep. For this insert there are two grades of

CBN available, BN2000 and BN7000, each with 0.2 mm nose radii. BN2000 has a honed preparation to the insert's sharp edge while BN7000 maintains a normal sharp edge.

Both tool types have through tool coolant and each tool shank across the range can be held in a common 6 mm diameter sleeve with two clamp screws. A location dead-stop pin ensures repeatability when setting depths which can be maintained within 0.02 mm.

Recent trials on a CNC sliding head turn-mill centre involved precision finish turning of a cone in hardened HRC 60 material using neat oil coolant. The brazed Sumiboron BSME tool demonstrated an increase in the number of components produced per tool to 3,600 compared to a competitor tool that had a recorded life that varied between 400 and 1,500 pieces. The cutting speed was 48 m/min with a feed rate of 0.2 mm/rev and depths-of-cut between 0.02 to 0.05 mm.

When finish boring 7.1 mm holes with emulsion coolant in hardened automotive



components, the use of Sumitomo's SEXC indexable insert grade BN2000 increased the number of parts produced per corner by over 400 per cent to 2,700. Cutting speed was 156 m/min (7,000 revs/min) with a feed rate of 0.03 mm/rev and depth-of-cut of 0.10 mm.

Sumitomo Electric Hardmetal Ltd

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GB Precision uses gun drilling to optimise mould tool sets

Looking at tasks from a new perspective can yield significant benefits, which is why specialist engineers, GB Precision sometimes chooses to use gun drilling as part of its machining strategy, even when it may not be the most obvious solution.

On one recent occasion, the decision to use this technology resulted in the reduction of components in a tool set from three parts to one, obtaining considerable overall cost and time savings for the customer.

As the name suggests, gun drilling is a process that produces deep, straight holes, and has its origins in the manufacture of gun barrels, but, even though it is now quite widely used, particularly in the oil and gas sectors. GB director, Paul Turner thinks it has plenty to offer in other situations, including prototype and pre-production work for the aerospace and medical sectors, as well as for engineering mould tools.

Gun drills differ from conventional drills in several critical respects: in their single cutting edge head geometry; in their use of guide pads to maintain hole-straightness; in the insertion of high pressure coolant through the spindle and gun drill centre and the removal of chips through a groove on the outside edge of the drill.



The company undertakes gun drilling on a variety of standard and exotic materials, with diameters from 1 mm to 10 mm and depths of 30 or more times diameter on both its high specification 5-axis Mori Seiki and Roeders 601DSH

machines, which provide extreme accuracy and stability and offer the company maximum flexibility for work scheduling.

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WNT (UK) Ltd, based in Sheffield is a sales organisation supplying precision cutting tools to the metalcutting industry. The WNT Group is successfully represented internationally in 19 countries and has its headquarters in Germany. It is part of an international group of companies with more than 5,800 employees worldwide.

We are now moving forward with an expansion plan of our current successful team of application sales engineers from 4 to 7. These field-based positions will further enhance back up to WNT's existing team of 20 technical sales engineers, providing dedicated applications and project support service to customers. For these customer-facing roles, we are looking for engineers taking their first step from the shop floor to technical sales.

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TOTAL TOOLING = QUALITY x SERVICE²



Sandvik Coromant shares its manufacturing vision at MACH

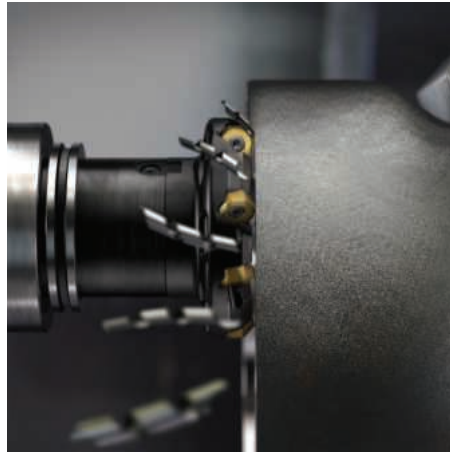
Recognised as the premier event for manufacturing technologies in the UK, Sandvik Coromant was more than ready to share its expertise, knowledge and vision for manufacturing challenges at the recent MACH 2016 event, under the banner "Together we shape the future of manufacturing."

Strengthening its offering in Industry 4.0 areas like digital transformation, intelligent machining, digital product and application recommendations and tool data in ISO format, Sandvik Coromant is actively influencing the ongoing industrial revolution. It continues to develop its Industry 4.0 position with modern advancements such as data exchange and manufacturing automation. Recently acquiring Prometec GmbH, a sophisticated process monitoring company, and opening the Additive Manufacturing Centre positions Sandvik Coromant as an industry front-runner in new manufacturing technologies.

The highlight of every show is new products and the 2016 show was no exception. Sandvik Coromant introduced sought-after concept milling tools such as the CoroMill 390 with size 07 inserts and the CoroMill 745, a double-sided multi-edge tool for positive cutting. The new GC1130 insert grade with Zertivo™ technology has a coating and substrate that can handle the toughest materials at the highest cutting data. Also new this year is the CoroTurn 300 featuring eight-edge, long-lasting inserts



CoroMill 390 with size 07 inserts



CoroMill 745

and iLock™ interface for the highest insert stability and accuracy.

Advanced planning

Working closely with machine manufacturers and customers, Sandvik Coromant develops customised tooling solutions and setups on new machines for a fast return on investment. The Right from the Start programme shows customers how to take advantage of tooling up a machine before it is delivered so it's ready to run on the day it arrives. Through advanced planning, Sandvik Coromant helps customers get ahead of the competition.

Customising solutions

With today's complex components and difficult materials, there is no one size fits all solution in manufacturing. Sandvik Coromant highlights process engineering support and showing how new tools can be customised or existing tools can be tailored to meet exact customer specifications. CAD/CAM design and support, insert and tool rationalisation, tooling logistics and ecommerce are additional ways Sandvik Coromant is committed to supporting customer needs.

Around the clock support

Rounding out the offer of high quality, advanced tooling and machining methods is 24/7 online technical support and training programmes offered by Sandvik Coromant. These service offerings keep customers

from losing valuable machining time needed to meet ever-shrinking deadlines. Whether it's a phone call, the e-Learning program or a face-to-face meeting, take advantage of the extensive knowledge and expertise Sandvik Coromant has to offer. Other valuable service offerings are the Productivity Improvement Program (PIP), which evaluates every stage of a process to find time and cost savings, and recycling and reconditioning for budget and environmental considerations.



CoroTurn 300

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3,100 patents worldwide, employs over 8,000 staff, and is represented in 130 countries.

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90 degree shoulder milling will never be the same again!

The new double-sided 90 degree shoulder milling system from WNT maximises productivity by having eight useable cutting edges per insert. The cutter body and insert design also ensures a precise 90 degree cutting profile can be machined.

Added to this is the combination of WNT's Dragonskin coating technology and the use of a unique durable nickel-plated cutter body, which delivers increased productivity, remarkable process security and an attractive price per cutting edge, making make the WNT's 4910 milling system an absolute must-have for all shoulder milling applications.

The majority of modern machine shops have a regular requirement for square shoulder milling and with the introduction of the new 4910 series of cutters from WNT they now have an option that can maximise a machine tool's spindle power, while generating a precise 90 degree shoulder.

The 4910 system uses double-sided inserts that have eight useable cutting edges, making it not only highly productive, but also extremely cost-effective. While an excellent price/performance ratio is an attractive proposition, the WNT 4910 system has many other benefits. The precision ground inserts are extremely stable and free-cutting, designed for the toughest requirements and the geometry guarantees a very soft cutting action, ensuring smooth running and minimum strain on machine spindles even at high feed rates. These attributes are most evident when machining thin-walled or unstable components. Also, due to the low power consumption of the 4910 milling system the cutters can be used on less powerful machines.

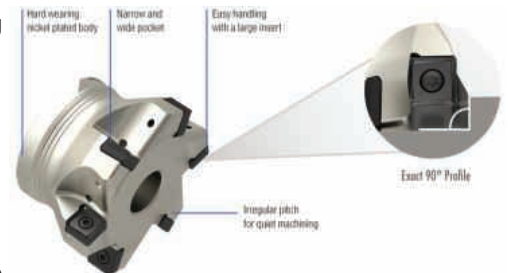
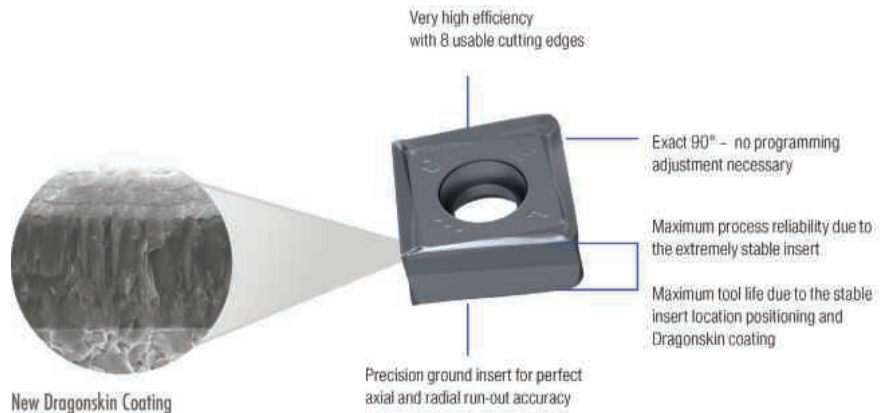
The use of WNT's legendary Dragonskin

coating on the inserts for the 4910 milling system gives the inserts a distinct advantage over competitor inserts through improved wear resistance and increased cutting performance and process stability.

One example of these performance benefits is that of a customer machining rough-forged slabs (material 36CrNiMo4) on a DMU 80 Monoblock 43 kW machine using the 4910 system for side milling and slot milling. Despite the WNT holder having one insert less than the system he had used to date, both tool life and feed rates were increased, with feed per tooth increased by more than 100 percent to fz 0.27 (previously: fz 0.13). As a result the metal removal rate increased by an impressive 84 percent from 105 cm³/min to 193 cm³/min. The increased tool life allowed three components to be machined prior to indexing the inserts, a 50% increase in productivity.

In another example, machining 1.2312 (40CrMnMoS steel) cutting data of surface speed (Vc) of 150 mm/min, depth of cut (ap) 3.5 mm, federate (fz) of 0.22 mm was applied. After 20 minutes of use there was no sign of insert wear, the component surface finish was perfect and power consumption was only 29 percent.

"Due to the new geometry of the inserts and the irregular pitch, the tool runs very smoothly when in use, which of course prolongs the tool life. Never before has there been a system that enables a precise 90° cut while also having eight usable cutting edges per insert. This makes our system not only unique but also very



attractive due to the favorable price per cutting edge", says Michael Scheffold, product manager at WNT UK.

The new 4910 double-sided 90 degree shoulder milling system from WNT provides the optimum solution the square shoulder milling. The combination of a precise 90° cutting angle, eight cutting edges, and a stable cutting platform provided by the cutter body, significantly improves cost-effectiveness. The increased performance capability of WNT's 4910 system through increased cutting data and metal removal rates added to the extended tool life thanks to the Dragonskin coating and cutter body design also significantly reduces machining costs.

To discuss your 90 degree shoulder milling requirements with one of WNT's specialist technical sales engineers call on the freephone number 0800 073 2073. Further information can also be found on the WNT homepage at www.wnt.com

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www.wnt.de/en-en/

Kyocera SGS introduces 'Tool4Life' regrind service

Kyocera SGS, the specialist in the production of solid carbide rotary cutting tools for machining difficult materials in the aerospace, medical, offshore and other industries, has introduced a new service called Tool4Life.

When a customer buys one of the company's Z5 HPR high performance end mills of 10 mm diameter or above, Kyocera SGS offers to regrind and recoat it free of charge, provided that it is not irreparably damaged. Alternatively, to ensure continuity of production at a customer's factory, a replacement milling cutter can be exchanged for a worn tool within 24 hours.

The Z5 HPR solid carbide range of tools is designed for roughing titanium and nickel alloys, cast irons and alloy steels including stainless grades. Subcontractors and OEMs working with these materials can therefore take advantage of the regrinding and recoating service, both of which are carried out at the Kyocera SGS European headquarters and technical centre in Wokingham, Berkshire.

Alan Pearce, the company's EU managing director comments: "We believe that with tool refurbishments or a next-day replacement cutter to keep a customer's production going, our Tool4Life initiative is unique in the metalcutting sector."

"It is a reflection of the quality of our solid carbide end mills, which can be repeatedly reground for the life of the cutter unless the teeth are beyond repair when we inspect them, and there is no restriction on the number of tools that a customer can send us."

Z5 HPR end mills are available in diameters ranging from 3 mm to 25 mm. A variety of square and corner radius options may be specified, as well as many different lengths.

Due to its asymmetry, the variable five flute pattern suppresses chatter over a wide spindle speed range and is so effective that a patent application has been filed. A surface finish of 0.8 Ra or better is normally achieved, even during aggressive roughing.

There is a choice of two multi-layer, wear-resistant coatings. Tinamite M offers reduced friction and prevents built-up edge when machining difficult materials like titanium at high metal removal rates. Optionally, Tinamite A is highly resistant to abrasion and erosion and is more suited to cutting stainless steels and nickel alloys along with steels and cast iron.

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Guhring 'Speeds' up production with latest RF100 milling line

For improving performance on high alloy and stainless steel materials, Guhring has now introduced its new RF100 Speed Series of solid carbide end mills. Well suited to the aerospace, oil & gas and medical industries, where hard-to-machine materials are commonplace, the new RF100 Speed has been tirelessly developed to enhance a number of machining parameters.

Guhring's milling product manager, Rolf Ehrler says: "The target with the new RF100 Speed is to improve HPC performance where there is a small radial and high axial depth of cut. Simultaneously high speed machining demands a high feed rate for the highest possible material removal rate and this is something we have achieved with this new tool. The RF100 Speed is our answer in striving for a sharper and better end mill to meet our target of longer tool life with a higher cutting volume and a very smooth running performance."

The RF100 Speed is available in two versions. The regular length 2XD version is provided with a straight cutting design for slotting, roughing and finishing in a single tool. Additionally, the RF100 Speed is offered in an Extra Long version that has a 3XD cut length. On the 3XD variant there are chipbreakers spaced along the flute length to reduce chip sizes during long machining cycles. Whereas alternate end



mills generate long swarf chips, the 10 mm chipbreaker intervals along the land width ensure swarf is compact and easily evacuated from the work envelope. This improves efficiency and material removal rates when rough machining.

The face geometry is completely new and this is credit to the 48 degree high helix angle and the unequal flute spacing. Such a high helix angle would have potentially weakened the wedge angle on the face geometry, so Guhring extended the land angle to retain edge strength and give the cutting edge complete stability. The face geometry also has a particularly large gash angle to generate large chip spacing, which is beneficial for plunge, helical and ramp machining operations. With a geometry design that evacuates swarf from the machining area at unprecedented speed, high feed machining becomes an extremely stable and safe process with the RF100 Speed.

To extend edge life, Guhring has introduced a large corner chamfer and a 'double lip' correction to further strengthen the cutting edge and deliver uncompromising stability, consistency and tool life. When combining the astounding strength characteristics with the innovative chip breakers, unequal flute spacing and the groundbreaking geometry, the RF100 Speed guarantees exceptionally smooth and stable cutting at high speeds and feed rates.

Both the standard length and Extra Long series are available from Guhring in diameters of 3, 4, 5, 6, 8, 10, 12, 16 and 20 mm diameters, with shank diameters from 6 to 20 mm. The overall length of the tools ranges from 57 to 104 mm for the standard length tool and from 57 to 124 mm for the extra length version. This provides a maximum depth of cut from 8 to 45 mm or 12 to 65 mm for the standard and Extra Long series respectively.



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Dormer Pramet's all-rounder is simply versatile

Dormer Pramet's Force AD range provides an 'all-round' milling option. The universal 90° cutter features Dormer Pramet's 'AD' program of indexable inserts, including the ADMX07, ADMX11 and ADMX16. All offer improved stability in a wide range of applications, even under unfavourable cutting conditions.

Combining solid performance with the ability to support multiple materials and heavy machining, the Force AD assortment is an ideal option for numerous operations, including ramping, helical interpolation and plunging.

Dormer Pramet's Force AD line is suitable for use in a wide variety of materials, including steel, stainless steel, cast iron, titanium and nickel, and in some cases hardened steels, copper and aluminium.

A durable and versatile milling cutter with a wide range of diameters available, from 10-175 mm, the assortment provides reliable clamping of the inserts, particularly within the helical range. In addition, its specially grooved body promotes fast and efficient chip removal.

Both these features combine to give a more accurate cutting process and excellent operating safety with high stability during machining.

Meanwhile, the Force AD line offers a variety of insert styles, with geometries for aluminium and high feed applications recently added to the assortment. A positive geometry, with a rake angle of 25°, allows for a reduction in cutting forces, offering good productivity, lower machine power consumption and longer tool life.

Its cutting edge shape has been optimised to provide higher impact resistance and smooth machining. This, in turn, promotes a better workpiece surface finish. Compatible with a wide range of cutter bodies, internal coolant supply is supported across the entire range.

The merger of round tools manufacturer Dormer Tools and cemented carbide tooling specialist Pramet Tools was instigated in 2014. The combined product programme now encompasses a comprehensive range of rotary and indexable drilling, milling, threading and turning tools for the general engineering sector. An expanded sales and technical support service extends to over 30 offices serving more than 100 markets worldwide. These are supported by state-of-the-art production facilities in Europe and South America and a global distribution network consisting of five strategically placed hubs.

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Hyfore the first choice for workholding

Coventry-based Hyfore Engineering, a member of the Engineering Technology Group (ETG), has recently completed delivery of the latest phase of workholding fixtures to the Amtek Group UK manufacturing sites at Witham and Coventry.

During the course of 2015, Hyfore delivered 54 bespoke fixtures into the Amtek Group and as such has played a significant part in the re-emergence of the UK premium automotive Powertrain sector success story.

Based in Witham, Essex, Amtek operates a major aluminium die casting foundry and machine shop and casts components in the range of 400 to 2,700 t. The company works closely with its fellow Group member, Coventry-based King Automotive Systems Ltd, which is predominantly dedicated to machining and for which Hyfore is also a major workholding and fixturing supplier.

The two organisations supply a wide range of components such as knuckles, aluminium bed plates, link shafts, conrods, oil-pans, cam caps, hubs and transmission housings for OEMs and Tier 1 customers including Jaguar Land Rover, with around 45 percent of output directly for export.

The Witham facility produces mostly powertrain engine and transmission components, offering customers a fully integrated die casting and machining facility with components delivered in assembly ready condition.

Hyfore has a long standing reputation for



Sequential assembly of fixtures in the Hyfore factory in Coventry

designing, manufacturing and assembling bespoke workholding fixture solutions, including multi-part cube and tombstone with hydraulic power clamping.

Working with production engineers in Witham, Hyfore has custom-designed fixturing to optimise the machine centre's in Amtek's machine shop. Fixtures supplied cover the spectrum from cubes and tombstones to multi-part fixtures to suit various single spindle horizontal machining centres. Hyfore's automotive process and machine tool know-how was a key factor in the successful installations.

Additionally it has supplied 4th axis bridge plate type multi-part fixtures to suit both single and twin-spindle Chiron vertical machining centres which have been supplied by ETG. All fixtures supplied use the hydraulic clamping method and before commissioning, all were subjected to rigorous CMM inspection in Hyfore Coventry to verify conformity to design specification.



Rigidity and repeatability in the machining operations are key criteria, putting the onus on the fixturing, particularly for larger components such as oil pans. The dimensions of all components machined are within a 500 mm machining envelope and a high proportion of the operations involve milling, drilling and tapping with compound angle machining featuring heavily.

Production engineer Jeff Marshall explains: "We have worked with Hyfore very successfully for a number of years and they are our predominant workholding supplier.

"We involve them from the very early stages. Once we have a casting specification they design and prove out the prototype before taking the project to a production fixture. We are always looking to optimise our machine shops capabilities so it is important there is a lot of trust between the two parties, which is the case."

With an increasing number of OEMs and Tier 1 companies wanting to outsource more, Amtek is well-placed to continue to help customers to do so, being a reliable company which continually invests in increased capacity and the latest casting and machining technology, supported by Hyfore Engineering workholding expertise.

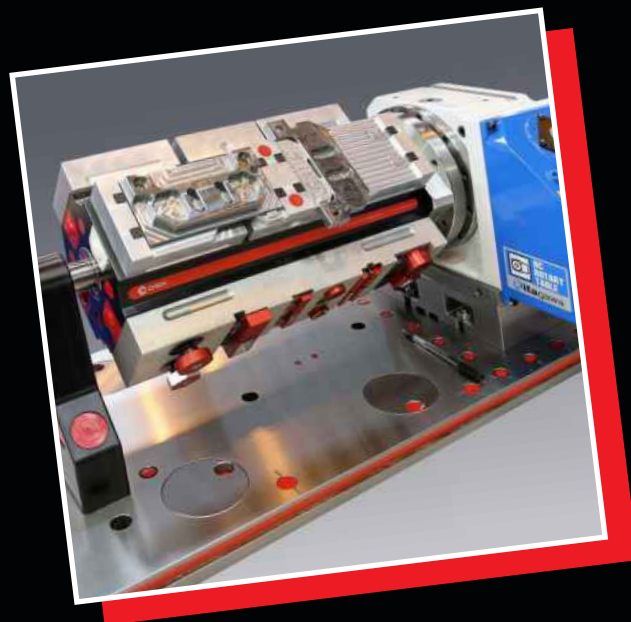
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SCHUNK takes its latest innovations to MENE 2016

At the forthcoming Manufacturing & Engineering North East (MENE) exhibition, on Stand D13, SCHUNK will be showing a multitude of new products alongside some of its established market favourites. At the Newcastle show, the innovator in workholding, toolholding and automation technology will be unveiling a host of new products for North East customers that didn't get the opportunity to see the innovations at the recent MACH show.



Firstly, SCHUNK will be keen to emphasise the benefits of its TENDO E Compact hydraulic expansion toolholder at MENE. Capable of reducing setup times by up to 60 percent, whilst generating 2,000 Nm of torque, the TENDO E Compact delivers micron precision for a host of machining applications. With this precision toolholder, even demanding applications with tight tolerances on the form, position and surface finish can be rapidly and reliably machined.

For workholding applications, SCHUNK will demonstrate a number of products that will include the flexible manual ROTA-S chuck with its optimised wedge bar drive system and improved lubricant system that ensures consistently high clamping forces. The ROTA-S chuck ensures higher rotational speeds and cutting speeds are possible and it gives users the opportunity to utilise more efficient cutting strategies that shorten the manufacturing time. The quick-change jaw system allows fast, comfortable and repeatedly accurate jaw changes.

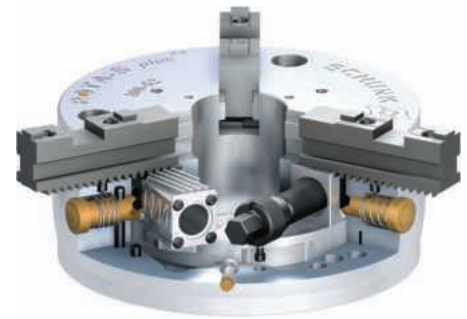
SCHUNK will also be showing just a few of its globally renowned gripping products. Representing the gripping range at MENE will be the MPG-plus miniature parallel gripper that is the most powerful miniature parallel gripper on the market. Compared with similar modules that require the same input, it achieves a significantly higher output, therefore paving the way for



increasingly smaller and more efficient systems. The higher force and maximum moment enable longer gripper fingers and higher gripping forces in modules of the same size.

One product SCHUNK will be drawing customer's attention to will be the new RGG Cleaning Unit. With this, manually blowing swarf from the work envelope of a machine tool can now be a thing of the past. The new RGG cleaning unit fits into tool mountings with a 20 mm diameter and can be converted into every machine tool configuration. A small control program can quickly clean the working area, tables and clamping devices, removing all chips. The machine conducts this task far faster and more systematically than any machine operator, saving considerable amounts of time. A powerful jet of compressed air or coolant shoots out of six nozzles of the cleaning unit. The head also rotates, which ensures that the work surface and the inside of the machine are cleaned without endangering the operator from flying chips.

Of course, as a world leader in clamping technology, SCHUNK cannot demonstrate all of its products at the show, but further information on the whole range will be available from the team at the show.



SCHUNK introduces trade-in offer

With so many manufacturers using under-performing toolholding and workholding equipment in the workshop, SCHUNK has now introduced an attractive 'trade-in' offer to improve the productivity of the industry. This limited period offer encompasses both tool and workholding with an offer on all its market leading toolholders and the wide variety of 8 inch lathe chucks.

The value of good toolholding practices cannot be undervalued with surface finishes, tool and spindle life and performance being impacted upon by inferior toolholding products and methods. To improve tool life and machining performance through high quality toolholding equipment, SCHUNK is offering a trade-in discount against its market leading toolholders, which will give machine shops the opportunity to try the new Tendo-E Compact.

Running parallel to the toolholding offer, SCHUNK is also extending this 'trade-in' promotion to its complete range of 8 inch (200 mm) lathe chucks. The centrifugal forces achieved during turning operations will exponentially reduce the clamping forces of the chuck as the rotational speed of both chuck and component increase. By using low-quality lathe chucks, this reduction in clamping forces can generate poor surface finishes and precision levels whilst increasing vibration and reducing service life of the machine spindle.

By trading-in and upgrading to a SCHUNK chuck, such as the popular ROTA-S Series, you will be buying into performance parameters that will noticeably improve your production levels and quality.

SCHUNK Intec Ltd
Tel: 01908 611127
Email: info@gb.schunk.com
www.gb.schunk.com

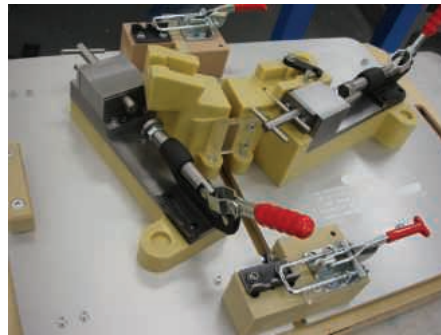
The Midas touch

Midas Pattern Company Ltd manufactures pipe checking fixtures for a number of automotive pipe suppliers. One frequently occurring problem is where there is more than one variant of a pipe. The differences may be very small, but in the majority of cases these variations mean that more than one fixture is required, resulting in considerable additional cost.

Midas was recently asked to reduce the cost of a set of automotive checking fixtures that included one pipe design that needed two versions, one just 15 mm longer than the other. As the extension was in the centre of the pipe it was not possible merely to make two different 'ends', which would have been the usual solution.

The team at Midas realised that by making the baseplate in two pieces and creating precision guides under that plate they could extend or reduce the overall length of the fixture by incorporating a simple clamp mechanism.

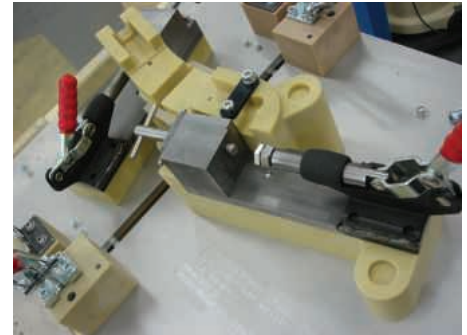
The fixture was designed on Midas' CAD system. The 3D model was then transferred to the customer for feedback, which



resulted in some slight modifications before Midas got the go-ahead to manufacture the fixture. As the clamping mechanism barely added any time at all to the process, Midas was able to save the customer approximately half the cost of buying two separate fixtures.

Midas Pattern Company Ltd has been manufacturing in the UK for nearly 27 years. Established in the autumn of 1989, the company has matured into a substantial and successful moulding and toolmaking business.

All processes are carried out to ISO 9001:2008 standards and are completely



audited by BSI as part of the accreditation.

Working across a range of sectors and industries, Midas has the scope and experience to understand what is important to you, the customer.

Anyone who is about to embark on a new project can visit the facilities and see firsthand how Midas can support you and deliver excellence.

Midas Pattern Co Ltd
Tel: 01234 358394
Email: r.sprakhall@midas-pattern.co.uk
www.midas-pattern.co.uk

Solid and split quick release clamping collars

A new range of solid and split quick release clamping collars has been introduced by WDS Component Parts Ltd, the Leeds-based engineering parts and equipment company.

They are designed to position tools and other attachments to shafts and are particularly suited to applications where regular adjustments are required. The range includes several variants and sizes. One version, the quick release collar with clamping wing screw has a steel collar with a black oxide finish. Its locking screw is stainless steel and its handle is made of engineering plastic with a brass insert. It is available in 11 sizes, to fit shaft diameters from 10 mm to 50 mm. A variant of this collar is available in a natural finish stainless steel.

For applications requiring rapid or frequent positioning of the collar, WDS also offers a number of a quick release shaft collars with an indexing clamping lever for securing them. Again, the collar is black oxide finished, the locking screw is stainless and the handle plastic. The same size range

is available, 11 sizes from 10 mm to 50 mm shaft diameter, as is a stainless steel collar version.

Another version of the indexing clamp collars uses a split shaft for easy mounting and positioning. The steel version is available up to 50 mm shaft diameter and the stainless steel range goes up to 25 mm.

The collars are complemented by a range of set collars, location pins and other positioning parts such as clips, chains and lanyards, as well as WDS's comprehensive range of engineering components. Together these allow WDS to meet the function and performance needs of an almost limitless number of engineering projects.

As with all its products, WDS is committed to quality. The company's senior management is committed to a Total Quality Management approach and maintains and continually develops a quality system which meets the requirements of BS EN ISO 9001: 2008.

WDS is the UK's leading manufacturer of



standard parts for use in machine build components, standard parts, jigs & fixtures, and consumer products. The range of products available from WDS grows daily and so has the methods available to designers and engineers for identifying, specifying and purchasing any of the 20,000+ parts currently held in stock. WDS has made ordering workholding solutions cheaper and quicker by removing small order surcharges.

WDS Component Parts Ltd
Tel: 0113 2909852
Email: sgray@wdsLtd.co.uk
www.wdsLtd.co.uk

Total metalworking fluid waste solution leads to major savings for Proseal

Proseal, a global leader in the design and manufacture of tray sealing machinery and tooling for the food packaging industry, working in partnership with Cardex-Motorex, has delivered major environmental gains and cost savings, through implementation of metalworking fluid best practice and waste management techniques.

With 18 CNC machining and turning centres on-site at its main manufacturing facility in Adlington, Cheshire and with business growing significantly, Proseal recognised a need to better manage its metalworking fluids. Working closely with Cardev-Motorex, Proseal now has a workable solution that delivers in all areas of concern and also provides a financial benefit to the business.

Key to solving the problem was the use of coolant recycling. The used coolant is now processed in a Cardev Coolant Cleaning System, which restores it back to 'as new' condition allowing it to be re-used in the machine shop. The process involves initial treatment of the old coolant, which is stored in a 'dirty oil tank', with Ozone infused compressed air in order to control any bacterial activity within the fluid. The next stage is to filter it down to five micron and remove any tramp oil. Once cleaned the coolant is transferred to the 'clean oil tank' where it is held ready to be distributed to any machine via a pipe network.

The Coolant Cleaning System is also linked to a Cardev Smart Mix system, which mixes fresh coolant to the correct concentration automatically. These two systems work in tandem, with recycled coolant being used as a priority and new coolant only being mixed when no recycled product is available, further reducing consumable costs. By maximising the use of recycled coolant along, with the added benefits of longer life, improved surface finish and low top up rates of the Motorex Swisscool 7755 Aero metalworking fluid.

Paul Wilson, Proseal's CNC manager indicates that Proseal has reduced its consumption of neat metalworking fluid by around 50 percent as a result of recycling and optimising the fluid used:

"The coolant recycling has become an



The Cardev Coolant Cleaning System and Smart Mix work in tandem to keep the 18 machines at Proseal supplied with coolant, either recycled or freshly mixed

invaluable system to us as a business. The benefits both environmentally and financially speak for themselves. We have reduced transportation cost, disposal costs and ongoing costs as we are purchasing less neat metalworking fluid concentrate.

"As an example, we used to send 2-3 barrels of old coolant each week for disposal. This requirement has virtually disappeared as we now recycle the vast



majority of our coolant. Even when we emptied five sumps recently for a machine



The Cardev Smart Mix system automatically creates fresh metalworking fluid solution to the correct concentration. This can then be supplied directly to the machine via a pipe system or via the Cardev coolant transfer unit

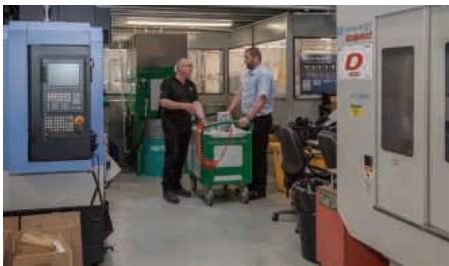


move, we were able to re-use the coolant thanks to the Cardev system.

"In addition, the Motorex Swisscool 7755 Aero fluid is perfect for the mix of work we do, the vast majority is aluminium, but we are called on to machine stainless steel as



The Cardev Smart Mix system and Coolant Cleaning System are compact and can fit in a relatively small footprint



well, so we needed a coolant that would work well with both. With the Motorex product we have witnessed lower top up rates, reduced evaporation, extended sump life so that we only empty and clean the sump once a year, improved surface finish and the working environment is improved."

Managing the partnership with Proseal is Cardev-Motorex sales manager Alan Dalton, who says: "Proseal is a perfect example of a customer embracing the total solution for metalworking fluids and recycling. We are supplying a total cradle to grave service for all of their metalworking fluid, lubricants and hydraulic oils. Our role starts from the initial fill of the machine's coolant system, with high quality Motorex metalworking fluids, through sump and coolant supply and lubrication system maintenance to recycling of used coolant and swarf.

"The Cardev fluid management systems that we have in place ensure that every stage of the process is covered and, as the figures are proving, the financial investment made can be quickly repaid, while at the same time the company's environmental targets are also being met."

Cardev-Motorex and Proseal are working in partnership to create the optimum



metalworking fluid and recycling process, with positive cost and environmental benefits.

Cardev-Motorex
c/o Environmental Technologies Ltd
Tel: 01423 522911
Tel: 01634 261288
Email: alan@cardev-motorex.co.uk
www.cardev-motorex.co.uk

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Purity of plastic products guaranteed

Metal separator finds "invisible" metal particles enclosed in plastics

In the following case, a manufacturer of plastic bushings for magnet coils had problems with metallic inclusions that made the finished product unusable. In an intensive investigation of all of the factory's internal production processes, however, no place could be found where these contaminations could have occurred. In cooperation with the raw material supplier, the manufacturer then inspected the new granulate new material that was used, but even the most thorough examination did not show any metallic contaminations.

Searching for the source of contamination

In order to find a solution for this problem, the plastic bushing manufacturer for test purposes installed a Protector metal separator made by Sesotec. Two bags from a granulate delivery were inspected with the metal separator. The test was performed under realistic injection moulding shop conditions. The Protector actually separated several grains of granulate. These grains had metal inclusions that absolutely could not be seen from the outside. Only X-ray inspection revealed the existing contaminations, in this case small pieces of copper wire.

Neither material supplier nor user could not see these contaminations, because the wire strands were completely enclosed in the granulate. Only the Protector system, with its inductive detection technology, was able to detect these metallic contaminations.

Sesotec metal separators detect and separate all metals, both ferro-magnetic and stainless steel, aluminium, copper, brass, or lead, irrespective of whether the metal is sheathed, coated, painted, insulated, enclosed, or in open form.

High benefit and fast return on investment

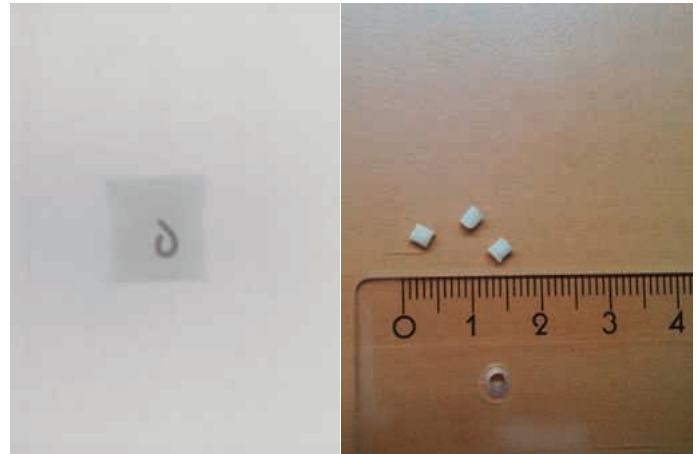
Based on these test results, the plastics processing company now uses Sesotec Protector metal separators as standard equipment in production. They guarantee that plastic parts are free from metal contaminations and are an important component of quality assurance. The metal separators are installed directly at the material inlet of the injection moulding machines, at the so-called "Last-Chance-Control Point".

As in the above described application, Sesotec metal separators are used both for the quality assurance of end products and for the protection of processing machines and moulds. Metal separators reduce the amount of rejects caused by contamination and minimise expensive and time-consuming malfunctions (down times, repairs). They clearly increase process continuity, productivity, and product purity. Metal separators thus provide a fast return on investment.

Stefan Taupp, Sesotec area sales manager says: "In the test, the Protector metal separator convinced our customer with its high sensitivity and reliability. All the contaminations, also those that were enclosed in the granulate, were reliably detected and separated."

Protector metal separators find applications in all industry sectors that use injection-moulding and blow-moulding machines, e.g. in the production of packing containers/caps, medical technology articles, technical plastic parts, connectors or housings in the

automotive industry, and from toys through to household appliances.



The tiny copper wire contaminations only were detected when the plastic granulate grains (grain diameter approx. 2.2 mm, grain length approx. 3 mm) were X-rayed



A Protector with 40 mm passage width, for example, detects FE metal contaminations starting from a diameter of 0.4 mm

With a turnover of more than EUR 60 million, the Sesotec group is one of the leading manufacturers of machines and systems for product inspection and for the sorting of material flows. Product sales primarily focus on the food, plastics, chemical, pharmaceutical, and recycling industries. Sesotec's global presence includes subsidiaries in Great Britain, France, Italy, China, Singapore, India, Canada, and the USA, a representative office in Turkey and more than 40 agencies all over the world. The Sesotec group presently has 500 employees, about 400 of whom are working at the main factory in Schönberg.

Sesotec GmbH

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Ultrasonic expertise optimises performance in water processing

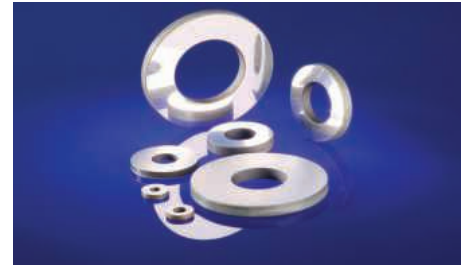
Morgan Advanced Materials has applied its world-leading ultrasonic transducer technology to water purification, helping to deliver components which improve performance in wastewater applications.

New processes using high-intensity ultrasound waves to break down bacterial biomass found in impurities in water have become increasingly popular in recent times. Unlike conventional processes currently used, ultrasonic is particularly environmentally-friendly due to the absence of potentially harmful chemical agents, such as methanol. Similarly, it offers superior performance when disinfecting water with high levels of turbidity, while traditional methods such as UV or chlorine are ineffective in such cases.

Central to the purification process are high-power transducers made from Morgan's proprietary range of PZT8 ceramics. Drawing on its industry leading expertise in specially-engineered ceramic materials, Morgan ceramic rings, originally used in welding and other high power applications, have for the first time been incorporated into ultrasonic transducers

used in water treatment applications. This latest innovation offers a range of performance advantages including high permittivity, low dielectric losses, high density, high piezoelectric activity and a high mechanical factor. Available in a range of sizes with a maximum diameter of 65 mm (2.6 inches), Morgan rings exceed the maximum width of ceramic rings currently on the market, allowing for the application of a greater volume of power, in some instances as high as 3 kW.

In aqueous media, ultrasonic waves cause periodic compression and extension of the water molecules, resulting in the formation of microscopic voids in the liquid. Such voids become bubbles of water vapour or gas and expand to the point of implosion. Large cavitation bubbles are typically produced from a range of 20 to 100 kHz, depending on the viscosity of sludge and therefore the level of force required, creating high mechanical shear forces capable of destroying even the most robust surfaces. Furthermore, sonication causes a reduction of the viscosity of the fermenter content, reducing the power consumption of the



agitators and pumps used in the purification process.

Frédéric Pimparel, technical application manager at Morgan Advanced Materials, explains: "This latest development in wastewater treatment technology would not have been possible without the application of Morgan's world-leading expertise in specialised materials. Our ceramic materials boast a range of properties which make them ideal for use in water treatment applications, optimising the purification process while negating any adverse side effects for the environment."

Morgan Advanced Materials

Tel: 01299 827000

www.morgantechnicalceramics.com

New system provides cost-efficient waste water treatment

NCH Europe has launched a new two-part waste water treatment system that is 1,000 times more powerful than standard powder or liquid bacterial formulations. The BioAmp system works in conjunction with NCH's FreeFlow products, delivering twelve species of food-safe active bacteria into waste streams.

Developed by NCH Europe's Waste Water Innovation Platform, BioAmp is a range of automated, computer-controlled delivery systems that an end user can easily program. They can automatically dose waste streams daily, reducing the need for manual labour.

The FreeFlow products used by BioAmp deliver roughly 30-500 trillion live bacteria into the waste water system daily, 1,000 times more than the nearest competitor. While many products remain dormant in a system for hours before taking effect, the bacteria contained in FreeFlow are active from the moment they enter the system. It is available in both liquid and tablet forms.

FreeFlow's bacteria were selected due to their ability to easily degrade



carbohydrates, proteins, animal and cooking fats, oils and grease (FOG). This makes them effective at removing trapped, decomposing waste that causes foul odours, usually as the result of a blockage of FOG that clogs drain lines or grease traps.

"BioAmp and FreeFlow allow businesses to avoid being exposed to financial, or even legal, implications due to their waste water disposal," explains Mario Kelly, VP of NCH Europe's Waste Water Innovation Platform. "Whether a business discharges to sewers or rivers, it must comply with strict regulations that require an effective treatment system."

"The BioAmp system is able to degrade contaminants that contribute to biological oxygen demand (BOD), chemical oxygen demand (COD) and suspended solids (SS), reducing the risk of charges or non-compliance."

Waste water regulation varies between discharge locations. Businesses that discharge their waste water to sewers may face court-imposed fines and internal operating costs based on flow and level of COD and SS contaminants. Discharges to river may have legal implications, determined by discharge parameters of BOD and SS.

BioAmp can be easily integrated with existing waste water treatment equipment and can mount easily in space-restricted locations. Trained NCH personnel service and maintain all of the company's systems, further reducing labour requirements.

NCH Europe

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www.nch.com

New Radan module turns customer order data into nests

One of the world's most powerful sheet metal CAD/CAM software systems, Radan, has launched another of its logistics modules, further automating the method in which customers can bring data into their system.

Radan product manager Olaf Körner says: "The new Radmanager is vital for Radan to integrate more fully into a company's complete I.T. structure. Traditionally, when people think of Radan they think of CAD/CAM. But it's actually a whole suite of connected products, and Radmanager is a simple way of entering customer order data and turning it into nest projects within Radan.

"In particular, this enables subcontractors to combine parts from different customer orders into one nest project to maximise efficiency and material usage."

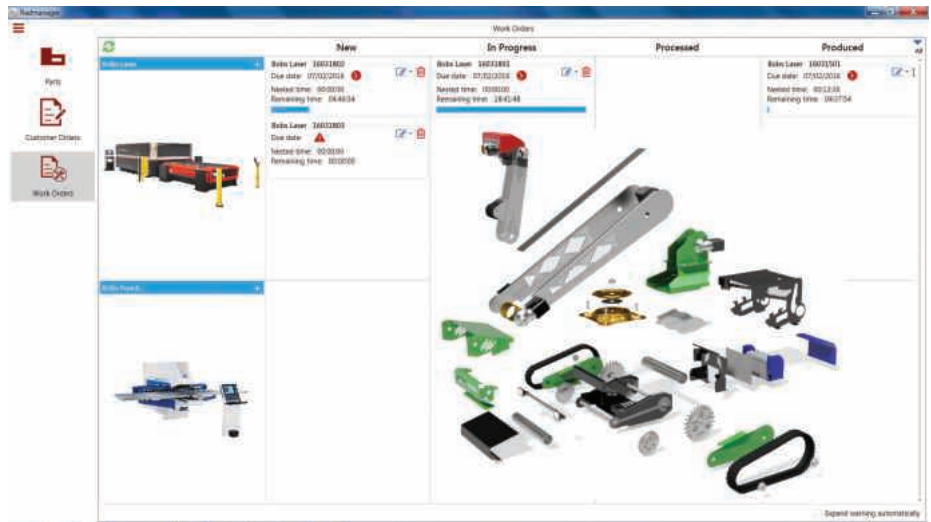
There are three specific aspects to Radmanager: parts; customers and orders; nest creation.

Firstly, information about the parts a company manufactures is stored, so repeat orders can be easily entered. Part data can be gathered from existing Radan part files, or entered manually before the part is drawn. Olaf Körner says: "Additional details, such as pictures, related CAD files and manufacturing data, can be attached to the part, so there's no need to enter data repeatedly every time the component is manufactured."

Secondly, details about customers can be entered, in addition to the orders they place. Each order can contain multiple parts, and the status of the order can be seen at a glance, before opening the order to drill down to more detailed information showing how the order is progressing. Olaf Körner continues: "Data can also be received from an ERP system via a CSV file, speeding up the operation and avoiding the need for duplicate data entry, which reduces mistakes caused by keying errors."

Thirdly, Radan nest projects can be created to meet any criteria. Olaf Körner explains: "A manufacturer may want to nest everything with a particular order-due date, or nest all parts made from a common material and thickness. The user interface makes it easy to find the group of parts meeting the criteria and put them into a nest project ready for cutting."

Once a nest project has been set up, it can



be processed in Radan in the normal way. Any changes to the quantities of parts nested can be sent back to Radmanager to allow any components that were not nested to be added to another project.

Olaf Körner says: "This helps create nest projects without generating remnants which would otherwise need to be managed separately."

Parts that are scrapped during production can be manually recorded against the customer order, allowing replacements to be nested as soon as possible.

Olaf Körner concludes: "Overall, as Radmanager has direct links with Radan CAD/CAM and can communicate easily with ERP systems, it is effective technology for transforming customer orders into nests. It streamlines the work flow of engineering parts and creating work orders.

"Manufacturers will be able to easily create nests for multiple orders, maximising efficiency and sheet utilisation, and manage their customer orders through the nest production process."

A separate mini-webpage for Radmanager has been created on the Radan site: <http://www.radan.com/processmanagement/radmanager>

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.

Vero has direct offices in the UK, Germany, Italy, France, Japan, USA, Brazil, Netherlands, China, South Korea, Spain and India supplying products to more than 45 countries through its wholly owned subsidiaries and reseller network.

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Tel: 01189 756084
Email: info@vero.co.uk
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www.radan.com

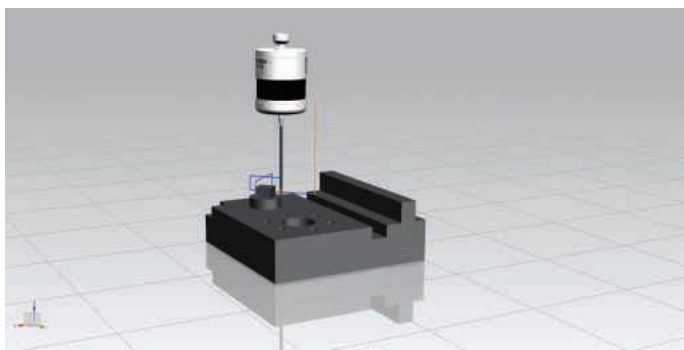
New software add on package

Probing PL+S (Siemens NX Edition)

TTL has launched a new software add on package called Probing PL+S (Siemens NX Edition).

The post processor specific software module provides the capability for manufacturing engineers and CNC programmers to plan, visualise and simulate machine based process control probing routines in an offline programming environment.

Traditionally probing programs and associated process control parameters are managed at the machine control as part of a component by component proving process. This takes valuable machine time and is an uncontrolled activity that becomes disconnected from the upstream part planning and part programming workflow.



Probing PL+S will fully integrate Siemens NX CAM software with all standard machine tool control based Macro Probing routines, whether it's Renishaw, Siemens, BLUM, Heidenhain, MSP etc. etc., and will enable increased component quality, reduced setup times and maximised productivity to be generated via the associative NX CAM programs.

With its simple and easy to use functionality, process control is defined within the familiar NX CAM interface and integrated into post processed NC programs, giving confidence that component probe positioning moves will be navigated safely and collision free.

Rob Pope, managing director of TTL, says: "At TTL we are all about recognition of the importance of developing innovative software technology solutions. Bringing products like Probing PL+S to the market fits naturally within our strategy to add value to our customers across a wide range of industries and to help them improve their manufacturing processes."

Probing PL+S is available for NX 8.5 and above and can be integrated with: Renishaw Inspection / Inspection+; Siemens Macro cycles; BLUM Macro cycles; Marposs Macro cycles; M&H Macro cycles; Heidenhain Macro cycles; MSP NC Perfect Part.

TTL, with over 150 years of expert CAM experience within the development team based at Haddenham in Buckinghamshire, is one of the leading industry names for CAD/CAM and CNC machining, and are Siemens Industry Software chosen technical partner for the UK to support their NX manufacturing software offer.

TTL

Tel: 01844 296650

Email: enquiries@ttl-3d.co.uk

www.ttl-solutions.com/probingplus

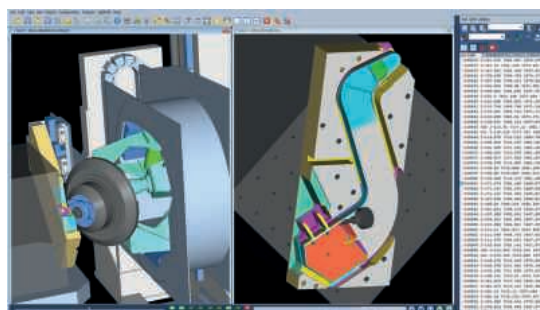
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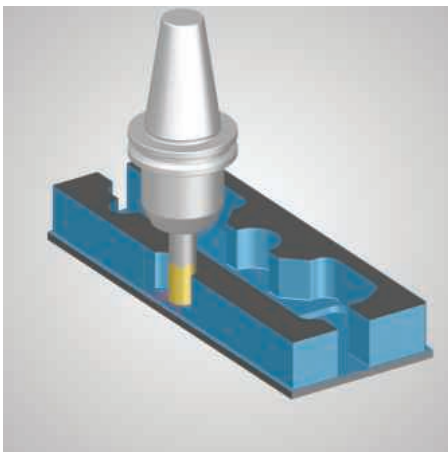
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Up to 60 percent time savings in roughing while simultaneously extending tool service life

New high-efficiency milling strategies with Tebis Version 4.0 Release 2

Tebis brings new high-efficiency milling strategies to the market with Tebis Version 4.0 Release 2, which will be delivered soon. The new strategies are especially well suited to components with steep cavities and can also be used very effectively for hard materials. They realise their full potential in machining with high-performance cutters (HPC).

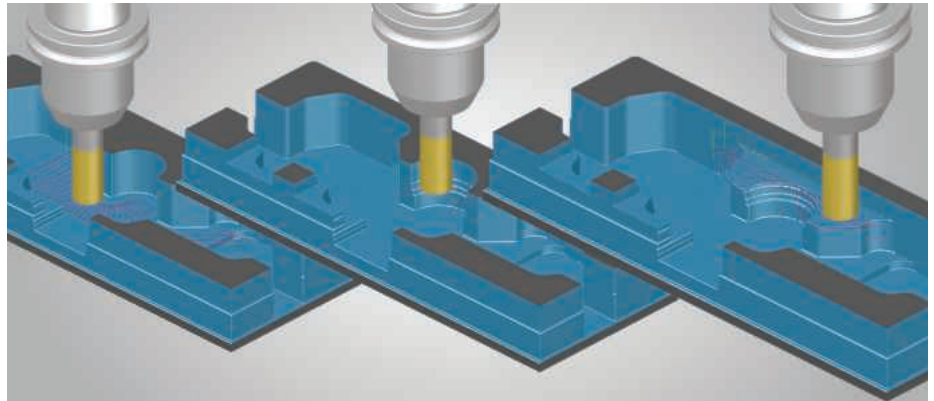
In adaptive roughing, the large depth of cut and optimal utilisation of cutting data ensure fast and cost-effective manufacturing at the same time. Optimal service life enables tool costs to be kept low. The path layout is automatically adapted to the geometry without full-width machining. The integrated re-roughing counteracts the formation of larger steps in steep boundary areas: These areas can be machined from bottom to top with a smaller depth of cut.



Components with steep cavities can be machined very efficiently using the new strategies in combination with HPC cutters. A time savings of about 60 percent was achieved in roughing this component. Despite this, a high tool service life was ensured. Lace-cut machining is also possible in adaptive roughing with Tebis

Tebis is a technology partner

However, the availability of the new milling strategies alone is not enough to fully exploit all the advantages. It is especially important that they be correctly implemented and combined with other strategies if necessary. In light of this, Tebis



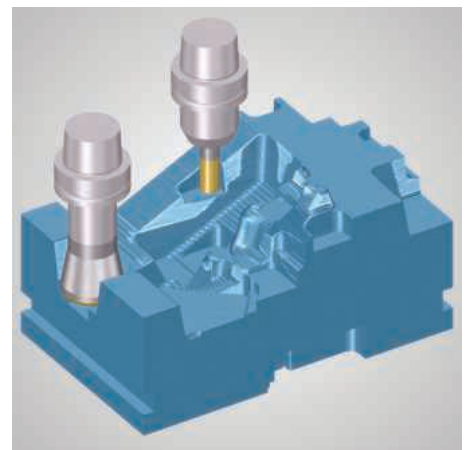
Integrated re-roughing enables the machining of larger step formations with a smaller depth of cut. The entire part now has a uniform stock allowance and is thus optimally prepared for subsequent finishing

has performed extensive tests in advance together with tool and machine manufacturers. Helmut Vergin, Tebis product manager says: "The best way to machine a component depends on a wide range of factors. These include the specific geometry, the material and the available tools and machines. Technology parameters such as cutting data and feed rates must be adapted accordingly to the machining."

As a technology partner, Tebis provides advice on how to best implement and combine the new strategies to achieve the best possible results.

Tebis is a software and process provider for the development, design, and manufacturing of models, molding tools, and components, offering consulting, CAD/CAM software, implementation and support from a single source. Working collaboratively and interactively as a true partner, the company applies its solution expertise and innovative technology to optimise the processes.

Backed by many years of experience, Tebis Consulting helps companies optimise their business strategies and processes. Tebis Software has an intuitive user interface that ensures a high level of quality and safety in manufacturing, even of highly complex components. Tebis also provides high-quality support that makes it easy for customers to introduce new technologies and fully exploit the potential of their CAD/CAM software.



Adaptive and concentric roughing strategies were combined together for this component, and ball inserts were also used in addition to HPC cutters. The technology parameters were exactly matched to the machining task. Even complex components can be roughed up to 50 percent faster in this way

Founded in 1984, Tebis is a leading company in the CAD/CAM sector. The company operates globally from Martinsried near Munich and maintains subsidiaries in Germany, other European countries, the United States and East Asia.

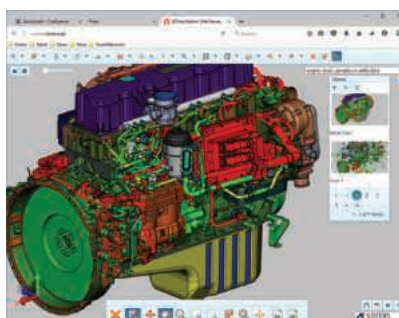
Tebis (UK) Ltd
Tel: 02476 158178
Email: jill.brennan@tebisuk.co.uk
www.tebis.com

Mechanical product configuration solutions need fast 3D CAD visualisation power

KISTERS has announced 3DViewStation WebViewer as the perfect 3D CAD visualisation tool for web-based mechanical product configuration solutions.

Today's product configurators need to be able to load variants and configurations of complex products dynamically and fast. In just seconds predefined subassemblies need to be loaded, positioned and scaled using transformation matrices. Intelligent algorithms need to be applied to have all parts find the correct location automatically.

As 10,000s of sub-assemblies might result in millions of combinations, working with CAD constraints is no option. The fact, that complexity of CAD data is growing more and more requires a smart concept to achieve a visualisation in real time. Also the support of mobile devices with limited bandwidth is a challenge.



To serve all these scenarios KISTERS has developed 3DViewStation WebViewer. There is no client installation required at all, it is very fast even with assemblies of 100,000+ parts and is designed for integration. If required, it can be easily customised to be integrated in the UI of the leading application. The XML-API allows dynamic un-/loading of parts and assemblies, geometries might be re-coloured, sections can be performed, measurements might be taken. 3DViewStation WebViewer's XML-API also allows to create dimensions automatically. KISTERS 3DViewStation WebViewer client just requires a HTML5 browser, does not require WebGL and runs on all operating systems incl. Windows, iOS, Android, Linux, MAC-OS.

The KISTERS 3DViewStation is developed by very closely following customer requirements; it is available as Desktop, ActiveX and HTML5 WebViewer product-versions. All product flavors are intended to be used together with a PLM-, ERP- or other management system like product configuration or service & spare part applications, providing all necessary APIs. For cloud, portal and web-solutions there is a HTML5-based WebViewer solution available, which does not require any client installation at all. All file formats can be used in combination with the intelligent navigation- and hyperlinking features to address needs of complex integration scenarios.

KISTERS is a worldwide growing IT-company, founded in 1963, as an engineering agency. Its 500+ employees develop resource management systems for energy, water and air, and information systems for the area of environment protection and safety.

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Mastercam
 CAD/CAM for CNC Machines and Robots

2017

...now released!

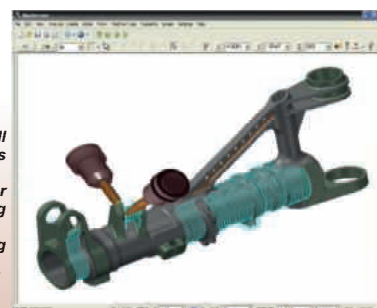
CNC Milling

From Entry Level Mill to Full 5 axis

Multiblade impeller Machining

Port machining

Standalone and Mastercam for SolidWorks



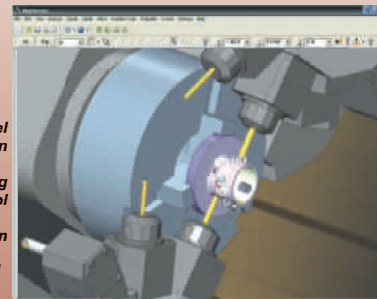
CNC Turning

From Entry Level Lathe to complex Mill/Turn

Swiss machining with wait state control

Machine simulation

Standalone and Mastercam for SolidWorks

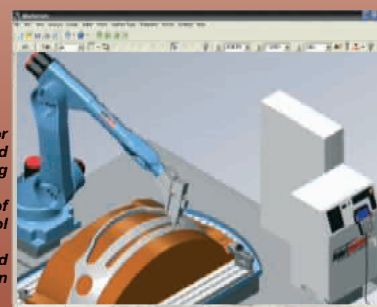


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Improving efficiency, speed and accuracy of production machining

3D Systems has announced the release of GibbsCAM® 2016 software for production machining. Building on the revolutionary Universal Kinematic Machine (UKM) technology of the previous edition, GibbsCAM 2016 delivers a variety of improvements to increase efficiency, accelerate programming speed, and enhance visualisation and accuracy for CNC machine programming. The GibbsCAM platform provides a powerful complement to additive, manufacturing processes, further empowering 3D Systems' users to transform digital concepts into physical realities.

The enhanced kinematic framework of GibbsCAM 2016 makes it a powerful and versatile CAM platform that is effective in nearly every manufacturing environment. Enabling solutions for complex

oriented turning capabilities, giving users added control in how tools interact with parts. From using a single tool at multiple B orientations to reorienting tool groups for use on a different spindle to full support of Flash Tooling for multiple-orientation turning tools, GibbsCAM 2016 delivers increased flexibility and control to CNC programmers; Added toolpath strategies for 5-axis milling, enabling users to define toolpath direction using the natural flow of a surface with the new Flowline option. Toolpaths can also now be extended in width as well as length.

Calvin Hur, vice president of software products at 3D Systems says: "The GibbsCAM platform is a key component in

today's advanced manufacturing workflows, allowing our customers to optimise their machine processes and unlock greater productivity. By working closely with users over the past year, we've enhanced our understanding of the evolving needs of the factory floor, and are pleased to

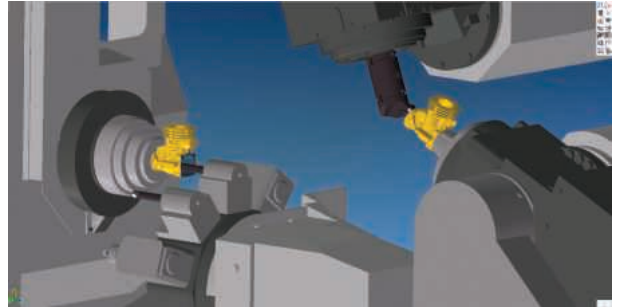
offer these improvements to help our customers maximise efficiency, safety and profitability."

GibbsCAM 2016 to be featured at IMTS

3D Systems has announced that it will be demonstrating the next generation of its Computer-Aided-Manufacturing (CAM) software, GibbsCAM 2016, at the International Manufacturing Technology Show (IMTS), from September 12th-17th, 2016, in Chicago, USA.

IMTS is an ideal opportunity to witness the level of ease and sophistication that GibbsCAM 2016 software brings to production machining. Building on its revolutionary UKM (Universal Kinematic Machine) technology, GibbsCAM 2016 delivers increased efficiency, accelerated programming speed, and enhanced visualisation and accuracy for CNC machine programming.

Recognised for its ease of use, GibbsCAM



was designed to help users eliminate scrap and reduce cycle times. Close work in tandem with shop owners and shop floor employees crystallised the evolving needs and necessities for helping customers maximise efficiency, safety and profitability while giving them the freedom to create without limitations and deliver significantly better products than ever before.

GibbsCAM 2016 together with 3D Systems' full range of end to end software solutions for manufacturing covering SCAN-DESIGN-PRINT-MANUFACTURE-IN SPECT can be seen in booth E-3310 and at the 3D Systems booth highlighting 3D Printing technologies at the South Building.

3D Systems provides comprehensive 3D products and services, including 3D printers, print materials, on demand manufacturing services and digital design tools. Its ecosystem supports advanced applications from the product design shop to the factory floor to the operating room. 3D Systems' precision healthcare capabilities include simulation, Virtual Surgical Planning, and printing of medical and dental devices as well as patient-specific surgical instruments. As the originator of 3D printing and a shaper of future 3D solutions, 3D Systems has spent its 30-year history enabling professionals and companies to optimise their designs, transform their workflows, bring innovative products to market and drive new business models.

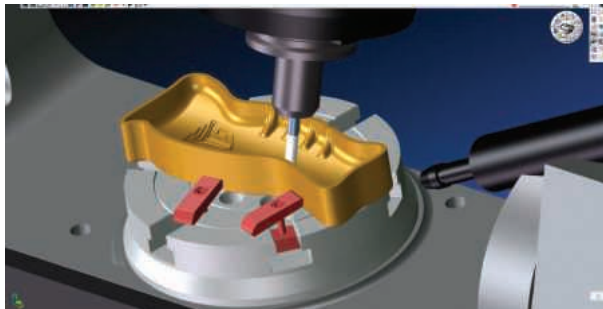
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programming challenges, such as oriented turning scenarios, GibbsCAM is compatible with a wide range of programming and machining operations, including solid modelling, high speed machining, 2- to 5-axis milling, wireEDM, multi-task machining and more. Recognised for its ease of use, GibbsCAM is designed to help users eliminate scrap and reduce cycle times.

New features and functions of GibbsCAM 2016 include: Enhanced thread milling, including support for multi-point tools, tapered threads for both single- and multi-point tools, and improved simulation; The latest VoluMill™ technology, providing new toolpath strategies to optimise high speed roughing of large pockets and slots, open face milling strategies that can decrease cutting time by up to 60 percent, and Technology Expert integration for ready access to optimal speeds and feeds; New

Version 19 of JETCAM Expert released

JETCAM has announced the launch of version 19 of its award-winning Expert CAD/CAM and nesting software, featuring several major new features and hundreds of improvements across the software.

Several features focus around nesting. Multi-sheet nesting takes advantage of JETCAM's powerful high performance nesting module to nest parts across multiple sheets at a time, drastically improving overall material efficiency while taking less time to generate the nests. Both the standard free form and high performance nesters can also now nest punching parts to be common cut, again improving material efficiency and reducing machine runtime. Automatic turret nesting works across all of JETCAM's nesting modules to take the turret loading into consideration when nesting, ensuring that nests are always able to run on the machine based on the loaded tools.

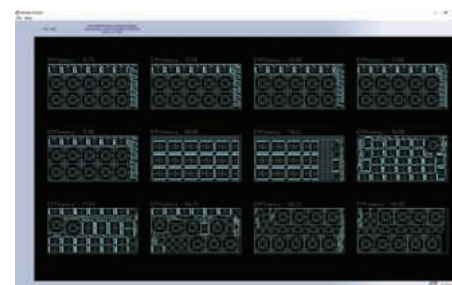
Multi-sheet nesting

There have been dozens of advancements in JETCAM's new user interface, with the most

notable relating to importing of CAD files and orders. Users can drag and drop a CAD file such as a DXF or other supported file directly onto the main component screen. In the orders lists users can also drag and drop one or more JETCAM component file for ordering. In-grid editing allows quick modification of quantities if required, or alternatively the user can specify a single quantity for all during importing.

Automatic Generic Sucker Placement can now be applied during the automatic tooling process. This functionality is used to specify the pickup location on the part for machines that have a robot unloading device.

Version 19 includes hundreds of other enhancements within the core product, additional modules and postprocessors. Nine new postprocessors were also added, covering Mazak, Messer Griesheim, Sonderhoff, Komo, Pierce, Vector, Accumax, Umbra and Dardi CNC machines. The update is available free of charge to customers with a current maintenance contact.



JETCAM has also launched an online video training centre, dubbed 'JETCAM University', which is available free of charge to all customers. There are several courses, covering core JETCAM products, with each course divided into categories, and each video taking only a few minutes to watch. The university keeps track of where the user has watched up to, serving the next video when they log in again. A keyword search facility is also available, allowing them to find tutorial videos on specific issues.

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CAD for CAM design tools

Mastercam is known for precision NC programming, but it also delivers a suite of shop-tested design tools aimed at getting parts on and off the machine as quickly as possible. Powerful modelling tools include not only 3D surfacing and solids, but hole-filling, direct editing without a solids history, geometry repair, and much more.

Mastercam Design streamlines and simplifies modeling and editing geometry. It also supports advanced geometry creation, including NURBS curves and surfaces, 2D and 3D associative dimensioning, surface extension, blending, trimming, splitting, variable filleting, solid modelling, hybrid modelling, and complete your jobs quicker and more efficiently.

Dynamic Xform

Allows the user to switch between gnomon manipulation and geometry manipulation mode at any time without having to reselect geometry. Mastercam X9 allows the user to switch modes as often as needed, which greatly enhances the usefulness and workflow of this function.

Solid disassemble

Solid disassemble is a new Model Prep function that takes a solid assembly and lays each body out in a single plane to help simplify toolpath creation. It works on models with and without history, imported from other systems, or created from within Mastercam. Automating this process saves the user multiple steps in preparing an assembly for manufacturing.

Solid position

This tool helps users to place and align solid bodies in relation to each other. Users can pick a face of a solid body and quickly mate it to a face of another solid body. This function allows you to redefine the base position of the body being moved, and then also redefine the final position on the body it is moved to.

Other Mastercam X9 design improvements

Associativity between solids edited with Model Prep tools and toolpaths has been greatly improved. When bodies are edited,



only the toolpaths directly affected by the change in the solid body are marked dirty.

Many Bounding Box improvements such as Push-Pull technology as well as the Apply and OK/NEW buttons allow you to complete one bounding box and start another without having to restart the function.

Selection from the back of a solid is now available any time General Selection is active. Both the Xform Offset and Offset Contour Options have a Join and a Slot option.

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Measurement Solutions introduce two new metrology products

After a successful MACH exhibition, Measurement Solutions is delighted to announce the arrival of two brand new products which make up the most complete portable metrology solution to ever hit the market. The new HandyPROBE Next™ portable optical CMM and the MetraSCAN3D™ metrology-grade 3D scanner are now available from the Peterborough-based metrology specialists.

The impressive new HandyPROBE Next has been introduced to deliver benefits beyond anything else on the market. With regard to precision, the HandyPROBE Next portable CMM provides two times more accurate measurements than previous systems with a volumetric accuracy of up to 0.064 mm over a huge 9.1 m³ measuring volume. Due to its TRUaccuracy technology, HandyPROBE Next accuracy is according to ASME B89.4.22 standards regardless of the instabilities of the surrounding environment, so accuracy is assured even when used outside a traditional measuring room.

HandyPROBE Next incorporates a wireless hand-held probe that enables the instant capture of coordinates. This instantaneous measurement can be conducted while being free of any rigid measurement setup. Easily detachable SMART Probes enable the user to quickly change the probe according to measurement needs, with automatic probe recognition ensuring that the measuring software is updated accordingly. Furthermore, the new system offers a greater, extendable measurement volume as it can be easily and dynamically extended, without the need for cumbersome "leapfrog" moves or complicated "bundle



adjustments", unlike measuring arms and laser trackers. This provides users with portable measuring arm ease of use with the accuracy and measuring volume of a laser tracker based probe system, all built into a new ergonomic design that is extremely sturdy and robust to enhance reliability and performance on the shop-floor.

Alongside the launch of the new HandyPROBE Next, comes the latest generation MetraSCAN3D metrology-grade 3D scanner. While boasting the same volumetric accuracy and measuring volume of the HandyPROBE Next portable CMM, the new MetraSCAN3D is 1.5 times more accurate than previous models and it is regarded as the fastest hand-held 3D scanner on the market. This is because it features the highest measurement rate among all laser scanners with up to 480,000 measurements per second, 12 times faster than the previous generation. Available in 350 and 750 models, customers can choose the speed and accuracy levels to match their specific requirements. Compared to the previous models, the latest MetraSCAN3D metrology-grade 3D scanner has also been completely redesigned with a light-weight,

sturdy and ergonomic design that significantly enhances user experience. Unlike traditional single line laser scanners, the MetraSCAN3D has up to 15 laser measuring lines available, providing rapid area based scanning like a white light system, all built into a lightweight, hand-held device.

In conjunction with the MetraSCAN3D, an all-new MetraSCAN-R will soon be

available for use with automated robot cells, to provide high speed, fully automated 3D scanning and inspection of parts on the shop-floor. The system will be available with full integration in the latest Metrolog X4 i-Robot inspection software, to provide an "off-the-shelf" solution for automated inspection. At the core of these innovative new solutions is the C-Track™ optical tracker. This system features a new, more aggressive design with a reinforced structure for improved stability as well as an



integrated handle to ease transport. Based on the latest USB3 camera technology, the all-new C-Track offers greater accuracy and faster measuring speed than previous systems. By offering 2 versions of the C-Track, Standard and ELITE, users can choose measuring accuracy according to their application requirements in conjunction with the HandyPROBE Next and MetraSCAN3D. While both systems offer a single measuring volume up to 14.1 m³, this can be easily extended to measure much larger objects.

Users have the possibility to select any combination of the C-Track optical tracker, HandyPROBE Next portable CMM and MetraSCAN3D to enable them to configure a personalized measuring solution according to their own specific measurement needs, according to accuracy, speed, measuring volume and budget.

All of the new systems are now available for demonstration.

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GapGun reduces panel inspection time by almost 90 percent

Trials by Leonardo Helicopters of the GapGun measurement system from Third Dimension have reduced MRO inspection times for interior and exterior composite panels by almost 90 percent in early results. The military helicopter manufacturer is conducting the trial on servicing of AgustaWestland Merlin helicopters at the Royal Navy's base at Culdrose.

GapGun, the handheld laser measurement tool, enables a quick, accurate and detailed profile measurement to be taken of the depth of scratches on helicopter panels and aircraft gearbox components. This enables operators to establish whether the depth of the scratches are within the 0.15 mm limit, and therefore determine whether the parts need to be repaired or replaced.

Using GapGun, results are consistent and comparable over time. Measurements are repeatable meaning they are consistent no matter who conducts the investigation whereas previously results differed from one operator to the next.

Since introducing the GapGun, the time it takes to inspect individual panels has been reduced extensively. While quantifying the total man-hours and money the GapGun saves per aircraft is still being measured, a process which could take up to eight months, Keith Masterton, AgustaWestland's Merlin Depth business manager, says: "We recently did a check on a panel and, whereas the previous manual process using a depth gauge took two-and-a-half hours, the GapGun measures it in just 20 minutes.

"It gives us a very quick indication as to whether the damaged area, or perceived

damaged area, is within acceptable limits."

The GapGun is also being used by Leonardo on aircraft gearboxes. Keith Masterton continues: "The GapGun is so easy to use, after a couple of hours you're trained, and you can't misinterpret the reading. It is a much quicker process."

Previous inspection systems were more time consuming using a depth gauge with parts being taken away for inspection, often for days at a time.

Steve Rogers, applications support engineer at Third Dimension, says: "Now with just a simple point and a click of the GapGun measurements can be taken in seconds saving valuable time and money. The full potential of how the GapGun can benefit Leonardo is just being realised."

In addition to servicing Naval helicopters, Leonardo is also using the GapGun to quickly and efficiently assess unused aircraft panels to see if they can be put to future use. The GapGun can be applied to virtually all manufacturing industries for quality inspection and is already being utilised in the aerospace, automotive and energy sectors.

It is Third Dimension's philosophy that measurement systems are all about helping turn measurement data into information to help improve production lines in real time.

Based in Bristol, Third Dimension has a long track record of supplying metrology equipment and services to the largest names in aerospace and automotive worldwide, such as Jaguar Land Rover and Airbus.

It has the capability to help manufacturers around the globe realise the benefits of non-contact measurement and can integrate seamlessly with customers' own systems.

Third Dimension's GapGun has the ability to provide manufacturers with a fully



auditable trail of every product measured. It has a unique range of flexible and ergonomic profile measurement systems that use optical triangulation to measure gaps, shapes and forms accurately. It is hand-held and can measure without ever needing to touch the surface. This maximises the accuracy and repeatability whilst eliminating potential surface damage and enabling the measurement of soft or unfixed parts.

Other benefits of the GapGun include: the ability to measure extremely complex features, customisable to measure virtually any surface or shape, including multi-coloured; total integration with customers' existing systems and software to facilitate improved processes; product quality management for manufacturers, using for example Inline view and advanced data logging; complete autonomy with built in Wi-Fi; a range of VChange measurement sensors that offer four different field of view options, which can be interchanged quickly and easily; uniquely adjustable laser cap to configure a short or split laser line to measure a range of complex features; rotating sensor heads and removable standoffs for better positioning; easy-to-view, high definition colour touch screen, with quick visual guide for the operator.

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High-resolution ScanArm for reverse engineering and CAD-based design applications

FARO Technologies UK Ltd, Inc., a leading company in 3D measurement and imaging solutions for metrology, factory automation, product design, public safety and BIM/CIM, has announced the launch of the FARO® Design ScanArm, a portable 3D scanning solution tailored for 3D modeling, reverse engineering, and CAD-based design applications across the product lifecycle management (PLM) process.

As a limited-time promotional offer, the FARO Design ScanArm will be bundled with 3D System's Geomagic® software at a reduced launch price. The available software options have capabilities that range from an automatic meshing software that delivers ready-to-use files without any post-processing to a full-featured reverse engineering software that combines history based CAD with 3D scan data to create feature-based, editable solid models compatible with all major CAD platforms.

Dr. Simon Raab, president and CEO of FARO Technologies says: "The FARO Design ScanArm was purposefully engineered to meet the needs of the Product Design market," "By combining FARO's best-in-class 3D scanning technology with 3D System's Geomagic software offerings, the Design ScanArm provides a turnkey solution that allows users to quickly digitise any part or object, easily design or modify reverse engineered models, create manufacturing-ready CAD models, and verify design intent of prototype products."

The FARO Design ScanArm features



optically-superior blue laser technology with fast scanning speed to deliver high-resolution point cloud data and the ability to seamlessly scan challenging materials without the need for spray or targets. The device is lightweight and maneuverable for convenient desktop mounting in the design studio or engineering lab. The Design ScanArm features a simplified user interface that makes it easy to operate regardless of skill level or 3D scanning experience.

Dr Simon Raab says: "Through a deep understanding of our customers' workflows we can ensure that FARO's solutions are optimised for application-specific demands and, as such, our customers are not forced to pay for features that do not add value to their processes. It is this engineering philosophy that allows the Design ScanArm to be aggressively priced for rapid return on investment without sacrificing any required technical capability."

The FARO Design ScanArm is the ideal 3D scanning solution for any organisation that may have the need to manufacture parts without existing CAD models, develop aftermarket products that need to fit tightly with existing products, reverse engineer legacy parts for design changes or replacement, create digital libraries to decrease inventory and warehouse costs, design aesthetically pleasing, freeform surfaces, or leverage the power of rapid prototyping.

To learn more about the FARO Design ScanArm, along with all of FARO's 3D measurement hardware and software, visit FARO at the 2016 RAPID Conference in Orlando, Florida at booth 111. Additionally, you can request a promotional price quote for the FARO Design ScanArm hardware-software combinations by visiting www.faro.com/en-us/products/metrology/faro-design-scanarm

FARO is a leading company in 3D measurement technology. The Company develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used



for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO's global headquarters are located in Lake Mary, Florida. The Company also has a new 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 3D Imager product lines. The company's European regional headquarters are located in Stuttgart, Germany and its Asia Pacific regional headquarters are 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, Vietnam, Thailand, South Korea, and Japan.

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New inVia Qontor confocal Raman microscope

The new inVia™ Qontor™ is Renishaw's most advanced Raman microscope. Building on the inVia Reflex, the inVia Qontor adds a new dimension to the performance and ease of use for which inVia is renowned.

The new Raman microscope sees the addition of Renishaw's latest innovation, LiveTrack™ focus tracking technology, which enables users to analyse samples with uneven, curved or rough surfaces. Optimum focus is maintained in real time during data collection and white light video viewing. This removes the need for time consuming manual focusing, pre-scanning or sample preparation.

The inVia Qontor, equipped with LiveTrack, enables the acquisition of accurate and reproducible spectra from samples with extensive topographic variations. Because a sample's topography no longer limits Raman imaging capability, LiveTrack opens up the analysis of a whole new range of samples and applications.

With LiveTrack, focusing is dynamic. LiveTrack provides continuous feedback to the sample stage which adjusts to follow the

height of the sample. This ensures the laser maintains focus during data collection and when manually moving the sample during white light video viewing. Optimum focus is maintained across uneven, sloping or dynamic samples, limited only by the maximum travel of the stage.

The inVia Qontor enables the analysis of samples that were previously impractical to study, or would have required extensive sample preparation. For example, uneven geological samples that normally require sectioning and polishing can now be analysed without any sample preparation.

Tim Smith, Renishaw applications scientist, says: "Acquiring in-focus Raman images of your whole sample is now a reality. Users can track the surface live while acquiring surface or even subsurface Raman data and later view the Raman image and surface topography of their sample in 3D. This innovation not only saves time but, in some cases, allows us to analyse samples that were previously impossible to study."



The inVia range of microscopes is trusted worldwide to deliver outstanding performance and reliable results, for even the most challenging experiments. The inVia Qontor Raman microscope's cutting-edge technology reduces overall experiment times and makes analysing even the most complex samples easy.

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New ring encoders with absolute feedback

High accuracy feedback of angular motion, compact dimensions, frictionless non-contact operation and resistance to contamination, despite having an optical grating, are the main benefits of the new ECA 4000 absolute ring encoder range from German manufacturer, Heidenhain.

It joins the ERA 4000 incremental ring encoder models, which have been available for more than a decade, and provides a direct upgrade path. The ECA variant offers 60 percent smaller position error and 45 percent faster operation.

Typical applications are controlling the position of swivelling heads, spindles and rotary tables on tool and gear grinders, machining centres and CNC lathes. The units may also be used to control robots and to position semiconductor wafer motion stages.

Owing to the ECA 4000's wide mounting tolerances, it is easy and quick to assemble to the host equipment. Each ring employs a three-point method that allows the installer to align the centres of the encoder drum and machine bearing in just a couple of minutes.

After setting the scanning gap between the read head and the outside diameter (OD) of the steel drum, signal quality is verified and the encoder system is ready for feedback to the control via a Heidenhain Endat 2.2 high-speed serial interface. Scanning units with Fanuc α / α i and Mitsubishi serial interfaces may alternatively be supplied.

ECA 4000 encoders are available with a wide spread of drum ODs from 104 mm to 560 mm. Inside diameters range from 70 to 512 mm so that machine designers can pass cabling and other services through the centre to streamline machine design.

Each ring size has a unique line count around the outside, up to 44,000 in the case of the largest model, for which an accuracy of ± 1.5 arc seconds is specified for the twin-track graduations. Each ring is capable of resolutions better than 0.01 arc second. Fast reaction time, even at speeds up to



2,500 rpm, make the encoders suitable for use with direct drive motors.

The encoders have a high degree of vibration and shock resistance, a protection rating up to IP67 and an operating temperature range of -10°C to +70°C.

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Additive manufacturing comes of age

Additive manufacturing, in its many guises, has been with us for more than 20 years and is now a thoroughly established technology for the manufacture of prototypes. There are a plethora of techniques and materials available to manufacture items ranging from simple polymer enclosures, to complex super alloy manifolds. 3D Systems has been developing equipment and materials in all of the fields since 1984.

During the last five years there has been a drive to investigate the opportunities presented by additive manufacture (AM) for production. Some organisations have dedicated themselves to examining the opportunities of AM production for a limited number of components (sometimes limited to one type) which are used in their products.

Alternatively, some organisations are looking more widely at the opportunities offered by AM in the production of a range of components. One such group of organisations is represented in the Innovate UK funded AA-PALM project. The AA-PALM project team includes McLaren Automotive, Ultra Electronics, Selex-ES, Flitetec, Delcam and 3D Systems. The AA-PALM project seeks to examine the capabilities of polymer and metal based AM for the purposes of offering an economic route to the small volume production of high quality components.



Each of the manufacturing partners is working with 3D Systems to understand how to adopt the AM process into the production supply chain, as well as optimising the design of components for AM. Each of the manufacturing partners uses a small number of different test components to thoroughly examine the capabilities of the AM process and to determine if those processes are now 'production capable' technologies that can readily be accommodated into their production quality approval procedures. Delcam has been developing bespoke software to assist with the manipulation of stl files to improve the accuracy of the AM components. Even though the project has almost six months to run the results are already showing a great deal of promise.

For example, one production component that has been designed to be built by the polymer selective laser sintering process has been developed by Ultra Electronics and is intended for use in autonomous undersea devices. The device is a key component and is responsible for ensuring that submersible vehicles are able to return to the surface of the sea when required. Traditionally the parts have been injection moulded, which has not only required expensive tooling costs but also prevents costly alterations to the design should the circumstances arise. The new AM component has not only passed all of the tests demanded of it, but is also cheaper to produce than the traditional part.

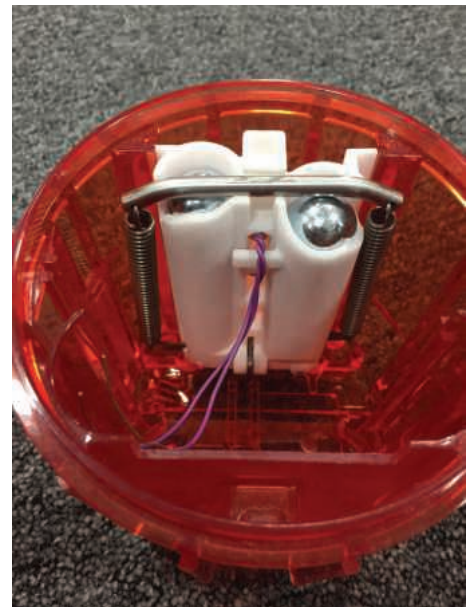
Furthermore, it allows considerable design freedoms, which in this particular case means that the part can be designed with a lower mass.

Richard Harman, chief designer on this project, says: "We are very pleased with how well the part has performed, and were surprised to find that the costs meant that this technology can be included in our product. We can now order the part on demand and, if necessary, change the design to accommodate customers' needs without having to worry about any additional tooling costs. We shall certainly be looking at using additive manufacturing for other components in our portfolio."

Whilst not all components will lend themselves to additive manufacturing, AM is now demonstrating that it is becoming a mature technology and certainly should be

considered as the production process for volume needs.

3D Systems is a leading provider of 3D printing centric design-to-manufacturing solutions including 3D printers, print materials and cloud sourced on-demand custom parts for professionals and consumers alike in materials including plastics, metals, ceramics and edibles. The company also provides integrated 3D scan-based design, freeform modelling and inspection tools and an integrated 3D planning and printing digital thread for personalized surgery and patient specific medical devices. Its products and services replace and complement traditional



methods and reduce the time and cost of designing new products by printing real parts directly from digital input. These solutions are used to rapidly design, create, communicate, prototype or produce functional parts and assemblies, empowering customers to manufacture the future.

3D Systems

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Investment in state-of-the-art plastics cutting capability

A leading filtration specialist is delivering fresh innovation through its extensive new controlled plastics cutting capability, achieving strong results at very high tolerance levels for a wide range of applications.

Porvair Filtration Group, a manufacturer of sintered porous Vycon® and BioVycon™ plastic materials, is now able to manufacture large area discs and shapes thanks to the state-of-the-art addition to its Wrexham facilities.

The company is also opening up its new contract cutting capability for other non-porous plastics materials.

Porvair, honoured last year with the Queen's Award for Enterprise in International Trade, has invested more than £100,000 in its new cutting technology and environmental controlled area.

Its precision cutting technology operates in a new temperature-controlled environment within +/-10C to ensure exact specifications are met, this is crucial for applications such as the manufacture of process chromatography support discs.

Achieving tight tolerances on large areas is challenging because changes in temperature will shrink or expand the material, so strict controls are essential. Porvair's new capability enables cutting of plastics sheets of up to a length of three metres by a width of two metres and 25.4 mm thickness to be cut to a tolerance of +/-0.4 mm and at a controlled temperature tolerance of +/-10C.

Customers often define the temperature at which the component needs to be measured, and Porvair is keen to meet their ever-growing expectations while driving defining improvements across the industry.

Process chromatography columns are used by the pharmaceutical industry for the large-scale purification of drugs such as insulin or therapeutic antibodies. The columns can have a diameter from 40 mm up to two metres and use porous discs, known as bed supports, at the top and bottom of the column to contain and support it.

Porvair's general manager, Roy Rigby says: "We are always working hard to realise



industry-leading innovation, and this new cutting capability is already key to delivering large area disc applications for our sintered porous Vycon and BioVycon plastics.

"We believe that the ability to cut plastic large area shapes to very tight tolerances under controlled temperatures is a significant requirement across many industries. We're therefore pleased to be able to offer it to customers and open up the capability to contracting cutting after investing in its wide benefits, benefits that we are certain they will share in."

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Solving the productivity puzzle

Shop floor networking software specialists, Forcam, chose productivity as the key theme for their exhibit at MACH. Forcam UK managing director Andrew Steele explains: "Productivity in the UK is around 30 percent behind other leading G7 nations such as the USA, Germany and France. The government has rightly highlighted the need for investment in capital equipment, skills and innovation, but without intelligent software to integrate the physical assets and give humans real insight into operations, gains cannot be fully realised. Productivity is one measure of this, but in capital intensive areas of manufacturing then ROI is also an important measurement."

Digitisation of shop floor operations goes by various names: Machine to Machine communication (M2M), The industrial internet of things (IIoT), Industry 4.0 and the Smart Factory. These terms all refer to the process of networking shop floor operations to gather and analyse performance data in real time so managers, supervisors and technicians can work together to improve efficiency, quality and output.

Andrew Steele says: "It's all about interconnectivity, information flow and providing real-time data for better control. By intelligently linking shop floor operations we can stream production information to machine operators more effectively and gather real-time production data. This real-time big data is analysed and re-presented to each team member in role-relevant reports that are immediately actionable. Potential production problems are more easily spotted, corrected and new opportunities seized."

Andrew Steele continues: "Organisations operating SAP or other ERP systems benefit even more. Accurate real time data direct from the shop floor supercharges ERP systems for more effective senior management planning and decision making."

Users of the software, Forcam Force, commonly report 20 to 30 percent productivity improvements and then go on to use the system as the basis for continuous improvement. Worldwide there are over 60,000 machine tools and processes networked using Forcam software. Existing users of Forcam Force include Daimler, Audi, BorgWarner, GKN Aerospace, Weir Minerals and many others.

Taking the first steps in digitising the shop floor operations need not be daunting and encourages good coordination of production, IT, facilities and other departments. So that companies can learn and experience the benefits of Forcam Force, the company has produced a starter kit, Smart

Factory in a Box. This is a fully functional version of Forcam Force that enables users to link up to three machines for a three-month pilot.

Connecting every machine and process for complete operational transparency

The case for networking shop-floor operations, especially in capital intensive plants, is compelling. Higher productivity, less waste, leaner manufacturing and transparency are the goals of these Manufacturing Execution Systems (MES), but these can be frustrated by incomplete machine connections.

As a leader in this field, with over 60,000 machine tools and plant items successfully connected using its Forcam Force MES, Forcam has deep knowledge and experience to bring to manufacturers and machine tool suppliers.

Difficulties connecting machines arise for many reasons. Different machine makers may use varied systems to gather and transmit operation data. Leading manufacturers, such as Heidenhain, Siemens and Fanuc, incorporate communication software with standardised protocols to enable machine interconnection. However, legacy machines may use obsolete or obscure data collection and data streaming software. Smaller and specialist machine tool makers can also struggle to apply intelligent monitoring systems. Data also needs to be aggregated and processed so that it is streamed into the MES in a consistent format.

Forcam's answer is to use powerful plug-ins that are relevant to the machine and control protocols. These produce consistent and reliable data transfer



covering multiple facets of machine operation such as alarms, tool allocation and the transmission of NC files.

Without the necessary knowledge and experience of implementing large scale machine integration, in-house teams or less experienced MES vendors may face long delays in implementation. Forcam also cautions that some vendors, lacking the library of plug-ins and experience of large scale system integration, will resort to the use of third party communication software, incurring high licence fees and imposing an on-going additional cost.

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HK3D brings 'game-changing' 3D printer to the UK

The professional 3D-Printing landscape has just been changed. The introduction of the new 3D Systems ProJet MJP2500 multi-jet plastic printing machine from HK3D is a paradigm shift in technology for the 3D print industry.

With price point in the region of around £25,000, HK3D's managing director, Steven Wilcox is adamant that this new machine is set to change the industry, saying: "This machine is a real game-changer. The technology in this new 3D Systems machine is streets ahead of the competition and it has clearly set the benchmark for others to follow."

Designed for the industrial professional, the ProJet MJP2500 delivers design verification for the end user that is beyond compare. This is credit to the unparalleled precision and the isotropic structure of the printed parts that gives customers the confidence to print parts that will interlink into assemblies and structures. This verification enables customers to confidently take their designs into full production.

For design and manufacturing engineers alike, the ProJet MJP2500 ticks all the boxes. It can precisely print within injection mould tolerances whilst the isotropic XYZ values provide the strength to print thin-walled parts that can be used in practical everyday applications. Additionally, the new machine offers enhanced design detail, a good selection of materials that can be printed at speed; with fast and simple post processing and intuitive new software that is easy to learn. This new 3D-Sprint software is a brand new development from 3D Systems that has been integrated into this latest machine.

At present, users of 3D printing machines may require an expensive third party CAD system to FIX any files prior to printing. However, the new 3D-Sprint software enables users to fix and edit files prior to printing. The intuitive software also has features for splitting parts, adding colour, texture and engraving to name just a few features. The 3D-Sprint software also has a facility for machines to be networked



whereby the end-user can select the printer of choice via the software. This remarkable new software suite also allows customers to stack and print multiple STL files. The user friendly and intuitive new 3D-Sprint software has been developed by R&D engineers at 3D Systems to create maximum functionality and ease of use.

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Laser potential for industrial manufacturing

Laser micro processing enables manufacturing processes for components that are not possible with conventional manufacturing techniques. Here, ultrashort pulse lasers with pulse durations in the pico- and femtosecond range are used to generate highly precise and durable structures in almost all solid materials. Another advantage of this process, besides the flexibly usable lasers, is that thermal and mechanical damages are negligible. Thus, for example thin-film strain sensors for measuring forces and momentums can be applied directly on the component. In this way, picosecond lasers generate functional surfaces with variable geometries by laser structuring. An application field for these surfaces is gravure printing in organic electronics.

Underwater works are often time-consuming and physically very demanding for the divers. LZH has developed an automated laser-based cutting process that increases the cutting speed significantly. Currently, the main application is cutting sheet pilings. But this laser-based process is

also suited for repairing offshore-facilities and ships, as well as for dismantling nuclear power plants or for underwater mining.

With Selective Laser Melting (SLM) it is possible to create the smallest three-dimensional structures, complex parts or individual implants virtually out of nothing.

LZH develops processes for the additive manufacturing of load-adapted parts and for the processing of special materials, such as magnesium. With Selective Laser Micro Melting (SLμM) it is thus also possible to manufacture parts with resolutions up to <30 μm. When high-quality machine parts are damaged, they can in many cases be repaired by Laser Metal Deposition welding (LMD). Moreover, adding layers by LMD can protect three-dimensional surfaces from wear and corrosion.

The LZH Laser Akademie GmbH, one of the leading further education centres in applied laser technology, together with the Schweißtechnische Lehr- und Versuchsanstalt (SLV) Hannover is the first to offer a new certified further education seminar titled "Additive Manufacturing



Specialist" nationwide. In this five-day course, skilled workers, master craftsmen and technicians learn how to operate systems for Selective Laser Melting.

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A hive of industrie at Prima's new technology centre

By John Barber, assistant editor of Engineering Subcontractor

On 23rd May, Prima Industrie officially opened the doors of its new headquarters and technology centre in Turin, Italy. A week later a group of international journalists, including the UK press, were invited to visit the impressive premises. The company has invested a significant amount in its new facilities, €15 million, which covers 5,000 square metres and showcases Prima's extensive range of machines. Prima Industries is rightly proud of its new centre which is completely self-sufficient from an energy point of view and built with green materials and technology.

The energy savings provided by the new facility are substantial. Laser has seen a 45 percent yearly reduction in CO₂ emissions. This is thanks to the shift from CO₂ laser sources to fibre laser sources. Bending has seen an even greater decrease in CO₂ emissions resulting in a reduction of 64 percent with servo-electric panel benders.

Finally, punching has seen substantial energy savings as a result of the green materials and technology. In this area 82 percent of energy has been saved due to Prima's servo-electric punching with ECOPUNCH® technology. There has also been a 13 percent reduction in scrap material reduction with the company's punch-shear technology.

Chairman and founder of Prima Industrie, Gianfranco Carbonato says: "With the growth in size over the years we had the need to create a central hub capable of strongly coordinating the various companies of the group. It is a project that we envisioned for many years. Today we finally have a home for the technologies of our group and in particular for the products of our Prima Power division.

"At this stage having one of the largest machinery ranges in the world in leading industries such as automotive, aerospace & energy, HVAC, lift & escalators and construction, it is increasingly important to have the possibility to welcome our customers at our site to explain our technologies. This is a basic requirement for a technologically advanced group like ours, which invests 6.5 percent of its turnover in



research and development and offers highly innovative products."

The new centre, which was completed in less than a year, has dedicated 2,500 square metres to the corporate offices of Prima Industrie and divisional offices of Prima Power. The other 2,500 square metres are for the demonstration room and customer hospitality. 11 machines in total are operating in the demonstration room including a whole production line.

Prima Industrie Group was formed in Italy in 1977 and following many successful acquisitions over the years, the company now has eight manufacturing plants around the world with a presence in a total of 80 countries. Claudio Banchi, executive vice president of sales in the EU and South America says: "We have about 40 years of history. The group was founded in 1977. There are two major pillars on which the business is based: Prima Power and Prima Electro. We make combination machines to get the benefit of combined technologies. A year ago we decided to build this centre. It is home for all of our technologies and machines." The purchase resulted in a coming together of Prima Power's laser & sheet metal machinery and Prima Electro's laser and electronic technologies.

In 2008 Prima Industrie successfully

acquired the Finish company Finn-Power. This is considered to be a key moment in the company's history as Claudio Banchi explains: "The most important acquisition of them all is the acquisition of Finn Power in Finland in 2008. This has enabled the company to strengthen its position in the Chinese market with the opening in March 2015 of a production factory in Suzhou. This represents a radical change in the business strategy of the group in this country, from a joint venture with importers to having a direct presence with majority stake."

In the last twelve months Prima Industrie has launched a number of innovations across all of its major product ranges. Examples include the 2D laser machine, Laser Genius, which has linear motors and technology from F1 as its carbon carriage and the 3D laser system, Laser Next, which is recognised to be the fastest and most productive of its type in the world. Completing the trio of impressive machines is the high performance punch-laser combination machine Combi Genius. The group is the only manufacturer of laser machines in the world that has developed its own fibre laser source.

Claudio Banchi says: "We have proved we are capable of innovation. The market recognises us as innovators. There are four

examples of innovation just in the last 12 months: Laser Next, Laser Genius, Combi Genius and the Laser CF. We are the only company today that are manufacturing the machines and the laser at the same time.

General manager sales UK & Ireland, Daniel McGinty says: "Our comprehensive product range of sheet metal fabrication machines and systems cover all aspects of sheet metal working, including laser cutting both flat and 3D, welding and drilling, punching, combined punch/shear, punch/laser, bending, automation, FMS, and software."

Prima has an extensive customer base including leading names in the automotive, aerospace sectors. Customers include Ford, BMW, Renault, Volvo, Airbus, Siemens, Tata and many others. One of Prima Industries' customers is CECOMP S.p.A. With its headquarters in La Loggia, not far from Prima's HQ in Turin, the company produces show and concept cars as well as the development and manufacture of dies, prototype assembly and production tooling. A family company, CECOMP was founded in 1978 and covers three different automotive services. As well as using a couple of older Prima machines, the Rapido and Optima models at its factory, the company also has a Prima fibre laser machine and a CO₂ laser machine. A total of nine Prima machines are used across two sites which helps CECOMP to produce up to eight cars per day and 1,000 cars a year.

Ongoing investment in technology is essential to ensuring a bright future. To this end Prima Industrie has developed, through its Prima Electro division, its own high-power CF laser source with fibre



technology. The company has also opened the Diode Fab, in collaboration with Politecnico di Torino, for the design and manufacturing of optoelectronic components. In the new laboratories, in Turin, there will also be research activities in Additive Manufacturing, the great technological revolution of the near future.

Concerning the history of the fibre laser and the importance of developing this project, CEO Ezio Basso says: "We started to work on the fibre in 2005. We were and we are CO₂ laser manufacturers and introducing a new product into our portfolio is significant as this will decrease the number of CO₂ lasers that we can manufacture and produce. We started to make a prototype which, I have to say, is completely different to the product which we have today. The first prototype was created in 2010, but since then the design has changed. We are

convinced that if you want to be one of the major players in 2D and 3D laser machines then you need your own laser.

"We continue to invest significantly in product development to ensure our technology is always at the cutting edge. We also devote important resources for a strong direct presence across the globe, confirming our commitment to a long-term growth together with our customers and stakeholders."

Gianfranco Carbonato says: "As part of our R&D activity, we are proud to have completed development and industrial launch of our Fibre Laser CF3000. We are the first laser machine manufacturer to introduce its fully proprietary Fiber Laser to the market. This will offer more alternatives to our customers, will improve our margins, and make more effective our application support and after-sales service activities.

"Playing an active role in shaping the future has always been a core commitment for our group. We are driven by our willingness and courage to responsibly invest in advanced innovation and in profitable and continual growth strategies."

It is clear that the new technology centre in Turin represents everything that Prima is passionate about, innovation and a firm commitment to providing excellent service to its customers both locally and internationally.

Gianfranco Carbonato concludes: "We are an international group but the heart and head are in Turin."



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New fibre laser machine for cutting larger sheet

Sheet metalworking machine tool manufacturer, Bystronic has extended its BySprint Fiber range of fibre laser cutting machines to include a larger model, the 6520. It allows metal sheet measuring up to 6.5 metres by 2 metres to be processed, whereas the other two machines in the range have maximum table capacities of 4 metres by 2 metres and 3 metres by 1.5 metres respectively. There is no compromise on speed, maximum simultaneous positioning of the axes being the same at 140 m/min.

There are numerous benefits of the bigger format. Material usage can be maximised when using larger sheet, as more parts can be nested with greater efficiency so there is less material wastage. The manufacturer's BySoft 7 process software supports users with intelligent nesting procedures.

More parts can be produced per cutting cycle before the next sheet is loaded, so productivity is raised. Additionally, the variety of applications is increased, as larger single components may be cut without

having to interrupt the machine in-cycle to reposition the sheet.

In addition, the large-format increases the variety of cutting applications on the BySprint Fiber. In addition to various small parts, large parts can also be cut from a large-format sheet metal as needed, without interrupting the machine during the laser cutting for repositioning. This is a competitive advantage not offered by laser cutting systems in current standard formats.

In addition to BySprint Fiber 6520, Bystronic offers the fibre laser in 4020 and 3015 formats, while the BySprint Fiber can optionally be equipped with the Fiber 3000, 4000, or 6000 laser sources.

Bystronic is a worldwide active supplier of high-quality solutions for the economical processing of sheet metal, other sheet materials and tubes. Customers benefit from application-oriented systems and services for laser and waterjet cutting processes as well as bending. Bystronic stands for reliability, high-performance innovation, an outstanding price-performance ratio and user-friendly



Bystronic has extended its BySprint Fiber range of fibre laser cutting machines to include a model capable of processing 6.5 m by 2 m sheet

operation. The focus is on the automation of the complete material and data flow of the cutting and bending process chain. As a partner, Bystronic offers security, continuity and transparency, and is represented regionally by competent employees who speak the customer's local native language.

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10 years in business and 10 years as a TRUMPF user

Dudley-based GF Laser is celebrating 10 years as a leading supplier of subcontract flatbed 2D and 5-axis 3D laser cutting services. The company, which has grown into a £2 million turnover, 20-employee business, started trading in 2006 with a newly acquired TRUMPF TLC CUT 5 5-axis laser, a machine that is still working reliably and proficiently to this very day. In the intervening years, the company has invested in three further TRUMPF laser cutting machines, which today form the bedrock of success at this progressive subcontract manufacturing business.

GF Laser was formed after being spun-out of sister company Moseley Brothers with the intention of creating a business based on 5-axis laser cutting. Today, however, the ISO 9001:2008 accredited company also offers 2D laser cutting, formed tube cutting, sheet metal bending, welding and powder coating services. Besides the provision of 24/7 production capacity, the company can also offer next day delivery to UK and Europe using its dedicated vehicles or retained couriers.



"We serve industries that range from automotive and yellow goods, through to construction and architectural," explains director Simon Tregillus. "We're one of only a few UK laser cutting companies to offer laser cutting utilising both 5-axis and 2-axis machines."

Aside from the original TRUMPF TLC CUT 5, which is still used on a daily basis at GF Laser, the company also has a TRUMPF TruLaser Cell 7040 5-axis laser with the latest split cabin technology and a TRUMPF TruLaser 3030 flatbed laser. The most recent installation, however, is a TRUMPF TruLaser 3040 fiber, which with its large bed can cut components up to 4,000 by 2,000 mm.

"The machines are extremely quick and reliably produce high quality parts, which is essentially why we keep returning to TRUMPF for our new laser machine requirements," says Simon Tregillus. "The TruLaser 3040 fiber, which we installed in 2015, is so fast that we are on course to achieve our shortest-ever ROI."

The company's commitment to ongoing investment is one of the principal reasons for its success, along with tight control over costs that can be passed on to customers, a dedicated in-house quality department and fast turnaround capability. The combination of these factors helped the company achieve its highest ever monthly turnover in March 2016.

GF Laser cuts parts up to 25 mm thick in all materials, including copper and brass, while batch sizes range from 1-off prototypes up to high volume quantities.

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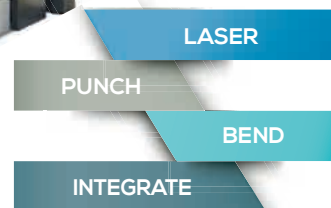
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KUKA expands product portfolio with flexibleCUBE laser



KUKA Industries has enlarged its product family. Besides the KUKA flexibleCUBE arc (the compact welding cell for automated arc welding), the KUKA flexibleCUBE laser is now also available immediately for customers.

"We thus offer an alternative in the field of laser machining. Some of our customers see great potential for implementing a compact and flexible production cell," explains Siegfried Heißler, division head / vice president ARCLAS at KUKA Industries.

The KUKA flexibleCUBE is the product of an intensive process of development work.

"We looked at the needs of the market and our customers," continues Siegfried Heißler. "The compact cell evolved on the basis of our customers' wishes and it is ideal for a dynamic production environment."

The comprehensive modular Cube system offers a variant to match any requirement. The compact cells require little space and can be easily relocated with a fork lift truck.

Siegfried Heißler explains: "Demand determines supply. That is the reason why we developed the compact welding cell. We also see great potential in laser applications for the compact solution from KUKA."

KUKA flexibleCUBE laser: one cell, many advantages

The KUKA flexibleCUBE laser provides the same advantages as the KUKA flexibleCUBE arc: flexible thanks to its compact design, user-friendly thanks to the plug & play solution and a high standard of quality. The compact turnkey cell includes the KUKA robot, the laser processing head, the laser-proof safety enclosure, the positioner as well as a modern cell and process visualisation tool. The open system can be combined with the most suitable laser for the particular application. The automation

specialist has acquired expertise in joining technology over decades and, with the KUKA flexibleCUBE laser, offers an automation solution which meets the highest quality requirements.

KUKA flexibleCUBE laser: one concept, a wide range of applications

The flexible design of the flexibleCUBE laser enables a broad spectrum of laser processes. Laser cutting and welding as well as laser cladding can be carried out. Thanks to the open system, the optimal laser beam source can be selected for the specific application.

One variant is the KUKA flexibleCube laser with KUKA's MWO-I Powder optics for laser cladding. In this case, the component is guided by a robot under stationary optics. The fibre-coupled diode laser used here combines all the associated components into a compact unit fully integrated into the flexibleCUBE laser.

In order to make new work environments both highly productive and ergonomically beneficial for the labour force, KUKA is developing central key technologies: collaborative robots, mobile assistance

systems, autonomously controlled vehicles and intelligently networked automation solutions that support humans in the work setting, easing the workload in a variety of ways.

"The networking of the cell is also of great importance," explains Siegfried Heißler.

"This allows the system data to be displayed and accessed centrally from anywhere in the world."

If questions arise, KUKA Remote Service can provide prompt support.

Larger monitoring radius for increased safety in laser machining

In laser machining, new beam sources offer continuously improving beam quality which in turn leads to constantly increasing power. State-of-the-art safety technology, such as the TÜV-certified enclosures and improved monitoring sensors from KUKA Industries, is essential to ensure that the systems and their operators are not harmed in the event of a malfunction.

The duration of exposure to the laser in the event of a malfunction is decisive for the safe enclosure of laser systems. Three test classes are distinguished. In the worst-case



scenario (test class T1), the protective wall must withstand irradiation for 30,000 seconds. This corresponds to exposure to a 20 kW laser for more than eight hours.

KUKA Industries has long offered a reliable solution for ensuring the safe enclosure of laser systems. The technology leader supplies the only TÜV-certified active laser safety sensor: the LaserSpy. Within milliseconds, the LaserSpy detects a beam malfunction and switches the beam source off before humans or equipment are endangered.

Through further development, the LaserSpy sensor can now cover a larger monitoring range. Each sensor consists of multiple detectors in a circular arrangement around a kernel. Instead of the previous 2.5 metres, the sensors can now monitor a range of 3.5 metres in every direction. This makes laser cells even safer and offers significantly improved and more cost-effective design possibilities in cell construction, for example, the use of elements with large surface areas.



The LaserSpy is an optical sensor which monitors the light-proof space inside a protective double-panel wall. If the inner panel is damaged, the highly sensitive LaserSpy sensor detects the beam entering the space between the panels, interrupts the safety circuit and automatically switches off the beam source via the Emergency Off circuit within milliseconds.

From its locations around the world, KUKA Industries offers its customers in the Automotive, Consumer Goods, Energy & Storage and Electronics sectors, and in many other fields, innovative joining and machining technologies, laser welding and special welding processes, as well as all process steps for the foundry sector and for photovoltaic and battery production.

KUKA Industries is the reliable partner for intelligent, process and customer-oriented cells and solutions. Experienced employees adopt a visionary approach to developing and integrating automation ideas for tomorrow's efficient and sustainable production. From the initial idea right the way through to production support, customers receive all products and solutions from a single source. With its comprehensive automation competence and in-depth process expertise, KUKA Industries provides its customers with a decisive competitive edge in the market.

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Fibre lasers demand balanced investment

"Customers need to consider their overall productivity targets to ensure they invest in the correct power level and balance it with suitable forming capacity "

With many profiling and fabrication shops instinctively drawn to the increasingly higher output capabilities of the latest fibre laser cutters, Amada argues that careful consideration should be given to correctly balancing the investment before any decisions are taken.

To explain further, many sheet metal manufacturers are simply unaware of the scale of increased throughput achievable by the ultra-high cutting speeds of modern fibre laser cutters. By way of example, Amada recently cut 1 mm thick aluminium using a 4 kW fibre laser (with oxygen as the assist gas) at an impressive speed of 120 m/min. In theory, a 6 kW fibre laser is able to cut even quicker, which would be close to the combined axis speed capability of most machines.

However, at these elevated speeds, the potential throughput of a 6 kW machine, which could offer 20 percent more productivity than a 4 kW machine, would far outstrip the ability of most downstream operations to keep pace. The upshot is that the forming section, for example, becomes the new bottleneck, leaving manufacturers unable to take full advantage of their new laser investment.

Amada, which offers 2 kW, 4 kW and a soon-to-be-launched in Europe 6 kW version of its LCG-AJ fibre laser cutter, advises that customers need to consider their overall productivity targets to ensure they invest in the correct power level and

balance it with suitable forming capacity. In short, Amada wants its customers to be able to justify the cost of a laser cutter, while still giving their downstream operations the attention they need.

The desire for ever-higher powered fibre laser cutters is, in fact, down to individual circumstances. In generic terms, high power lasers are required to cut thicker gauge materials with higher productivity. However, the significant majority of the UK sheet metal fraternity cuts sheet below 6 mm in thickness. With this in mind, companies need to consider their future plans. Goals such as increasing productivity by 50 percent or maintaining current productivity but reducing total costs have a major effect on choosing the right fibre laser power level. In many instances, a lower power fibre laser makes a more sensible and cost-effective choice.

Fibre laser systems have witnessed a meteoric rise in popularity, thanks largely to their ability to broach the limits of conventional CO₂ lasers, and these attributes are showcased in Amada's latest LCG-AJ laser technology.

Among the many benefits of the range is the superior beam quality on offer, making it exceptionally quick on thinner gauge materials. This is virtue of its innovative laser

engineering. Instead of the racks of laser diodes found in most fibre laser resonators, Amada's technology utilises 2 kW diode modules, which negate the need for many complicated splicing points. As a result of the fewer components and connectors, beam quality is enhanced and resonator life extended.



The Amada LCG-AJ can process a wide range of materials, including brass, copper and titanium, making it a pragmatic choice for fabricators that work with a varied material mix. Furthermore, it is particularly adept at reducing overheads, from energy consumption to labour costs. In fact, with the LCG-AJ, business owners can cut their electricity bills by more than 60 percent as it uses a third of the electricity required by CO₂ systems of the same power.

Of course, most people are aware that fibre laser cutting speeds outperform CO₂ when processing thinner sheet, increasing productivity on the shop floor. Indeed, the LCG-AJ series offers numerous productivity-enhancing features. For instance, the range deploys a highly dynamic motion system that achieves the acceleration and rapid traverse speeds of linear drive systems, while an automatic nozzle changer on the 4 kW and 6 kW versions and touchscreen control also help facilitate faster processing.

A further trend helping promote faster processing times is the shift from oxygen to nitrogen assist gas, particularly for mild steel below 6 mm thick. Moreover, nitrogen is increasingly favoured because no oxidation is produced on the edge and many fabricators have a welding process or a powder coating process after cutting.

Naturally, when laser cutting throughput is higher, manufacturers expect revenues to soar. This idea, however, comes with a few caveats, to the extent that purchasing decisions cannot solely be made based on cutting speeds. All investments need to be application, product and downstream-driven, and the LCG-AJ takes all of these factors into account.

When Amada discusses an investment with a customer, overall operations form the centrepiece of considerations: the materials that need to be cut, the products that need to be manufactured and the subsequent processes that need to follow. Although laser cutting is often the first production operation, Amada wants its customers to be prepared for the productivity gains that the LCG-AJ will

provide by considering the whole process. Ultimately, if manufacturing technologies are not correctly balanced, money will be wasted. After all, fabricators only get paid for what they can supply, and that always depends on where the bottleneck is positioned in the process stream. Capital expenditure is not limitless and the whole process must be scrutinised to achieve an effective solution.

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Fibre laser cutting is no longer an issue with the new LT8 3D from BLM

The LT8 from the BLM Group is the first machine in its size range to provide 3D cutting capability using a fibre laser. With the new "Tube Cutter" focusing head and other developments, the Lasertube family adds new performance and capabilities of its top-of-the-range products and takes an important new step utilising fibre technology.

The LT8 is the new top-of-the-range Lasertube system which expands and enhances the performance boundaries of the LT8 system, from which it is derived both conceptually and technically.

The possibility of 3D cutting utilising a fibre laser source followed a path that included the development of a new "Tube Cutter" focusing head, designed at Adige especially for the 3D cutting of tube. The new LT8 goes beyond this goal by offering other important news regarding the size of the workable tubes, the achievable performance and the usability of the system.

3D cutting with fibre laser

LT8 makes use of the new 'Tube Cutter' focusing head, specifically designed at Adige for the 3D laser cutting of tubes and profiles with fibre laser sources, to achieve excellent performance throughout the wide size range that this system allows you to work. The range was expanded in both in tube size and weight. LT8 is able to cut, with excellent dynamic performance, tubes with diameters from 10 and 240 mm with a weight up to 40 kg/m.

This important expansion in capabilities

meets the needs of the 3D machining that is particularly required in larger and thicker tubes that require bevels or weld preps.

The 'Tube Cutter' head, thanks its tapered geometry and its easy handling, has increased the capabilities for processing open profiles or asymmetrical sections with both quality and precision.

Graphical interface

The LT8 also benefits of the software modifications both in the user interface and in the programming CAD/CAM software.

The first change is the new user interface, now used on all laser systems, which is easier, more intuitive and efficient. The new interface guides the operator in the different operating phases of the work cycle with appropriate suggestions on the programming parameters.

In terms of CAD/CAM programming, the latest innovations introduced into the Artube3 package allow for a better and easier handling of tubes and profiles with "open" sections and the cutting of common of tubes.

Active tools

The LT8 features all the capabilities available across the Lasertube range.

'ActiveScan' is a measuring system that measures the deviations of the actual section of the tube with respect to the theoretical tube shape/size and automatically adjusts to achieve the highest part accuracy in the shortest time. With 'ActiveScan' you can measure the position of the tube, and centre the geometry to the actual tube location.

'ActiveSpeed' is a function that dynamically modulates the cutting parameters according to the real working conditions to



ensure the best results in every situation. Where previously an expert was needed to make complicated parts, now 'ActiveSpeed', available on all the ADIGE systems, makes everything very simple and affordable for everyone.

Handling systems, flexibility

The LT8 keeps all the winning loading and unloading features and flexibility features of the previous generation of machine.

The loading area for tubes still has two distinct stations, front and rear, to which you can connect modular loading solutions for different production requirements.

The part unloading is managed is optimised to take into account the huge variability of size and geometry of the tubes to be machined. The centring system, which is used provide accuracy on the long pieces, quickly clears the working area for downloading short pieces and enables maximum productivity to the system.

The LT8, with its fully automatic adjustments and a very high load/unload speed, is proposed as the optimal solution with maximum flexibility.

The BLM GROUP is a global partner for the entire tube fabrication industry with a worldwide presence and thousands of successful installations in a wide variety of industries.

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Service boost following investments at laser cutting firm

Sheet metal subcontractor Accurate Laser Cutting has built up a reputation for exceptional service since it was formed by company directors Jon Till and Steve Morgan in 2005.

As a high precision, fast turnaround job shop, quotations are dealt with in a strict four hour time frame and orders can be delivered to customers in as little as 48 hours.

Director Steve Morgan explains: "We do everything we can to meet our customer demands and strive to react to their requirements as quickly as possible. Our strong focus on service is what I believe, gives us the edge over our competitors. We aim to keep our lead times short and service levels high, whilst offering the highest levels of precision in the industry."



The ongoing commitment to service has been backed up with a string of machinery investments and software upgrades over the past decade. Last year alone, the firm invested £1.1 million in a state-of-the-art 6 kW 4 m x 2 m fibre laser and a range of pressbrake equipment with a maximum pressing capacity of up to four metres and 320 tonnes. It can now laser cut 30 mm aluminium, 25 mm mild & stainless steel, 15 mm brass & 12 mm copper to an excellent standard and have an array of tooling available to press materials up to 25 mm thick.

A further capacity increase is now imminent for the laser cutting firm, with plans in place to upgrade their CO₂ laser with a second fibre laser in 2016. Jon Till says: "Our intention is to purchase an 8-10 kW fibre laser as soon as a suitable model becomes available. This new investment will provide us with the additional capacity to turnaround orders much more quickly and keep up with ever increasing customer demands."

Processing speeds can be up to 70 percent faster on a fibre laser when compared to CO₂ equipment and the use of nitrogen gases means a much cleaner cut on parts is achieved.

Furthermore, a recent investment in bespoke quoting software SigmaNEST is also expected to boost service levels at its West Midlands headquarters.

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A cool solution

Salvagnini is renowned for flexible automation and innovation in sheet metal. The latest development from the company that was the first to introduce fibre lasers to the market place back in 2008 is a patented lens cooling system on its flagship L5 model laser.

The proprietary cutting head is enriched by the new "Dry Cooling" feature, an innovative system that cools the optics without gas. This active refrigeration system monitors and controls the temperature of the focusing lens, extracting, only when necessary, the heat required to maintain a stable temperature.

Dry cooling actually allows a further reduction of the operating costs of fibre laser systems. It reduces the consumption of nitrogen (the cost of which, depending on the country of installation, can be significant) and the cost of consumables, thanks to the increased service life of the optics. In addition, this cost reduction is accompanied by an improvement in cutting reliability.

The Salvagnini Group designs, builds and sells flexible systems and machines for

processing sheet metal: punching machines, panel benders, press-brakes, fibre laser cutting machines, FMS lines, automatic store-towers and software. Thanks to its global presence, the Group offers direct customer service in more than 30 countries around the world.

Salvagnini was designing, manufacturing, selling and servicing up-to-the-minute modular and flexible high-performance machinery and systems as far back as 1963. As a result, Salvagnini is able to offer the customers of today highly optimised and customised solutions. With its complete and diversified range of machines, Salvagnini is able to intervene in countless application sectors, providing secure and innovative answers for companies of all sizes.

These solutions, recognised the world over as the state-of-the-art in sheet metal processing, currently comprise: the P4 and P4lean, P2lean and P1 panel benders; the S4 integrated punch-shearing system; the SL4 punching-fibre cutting system; the S4+P4 complete panel production FMS line; the L3 and L5 fibre laser cutting machines; the E3,



Fibre laser cutting head featuring new Dry Cooling

B2 and B3 press brakes, the ROBOformER robotic bending cells; MD automatic pack or MV tray store towers and integrated systems for factory logistics.

It is these solutions that are the basis for Salvagnini's leadership worldwide. Innovation, competency, service: three words that describe Salvagnini's activity in the field of flexible automation and industrial machinery for processing sheet metal.

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FANUC showcases fibre lasers

Achieve precise 3D cuts with modular 3 kW laser and two robots

The YLR fibre laser from FANUC was unveiled at the recent LASYS exhibition in Stuttgart in the shape of a model with 3 kW laser power. The series includes models with power ratings of between 2 and 6 kW that match the alternative beam sources of the company's CO₂ lasers.

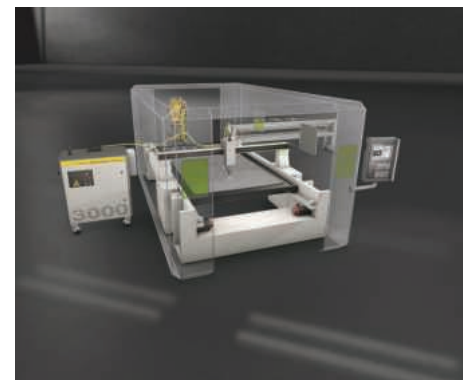
A demonstration cell with fibre laser, based on practical operation, and two robots for cutting pipes were shown at LASYS. The two robots were connected using dual-arm technology. One robot with a SCHUNK gripper pinpointed a pipe section using a FANUC vision system and stalled it for the second robot for processing. This second robot was equipped with a Precitec cutting head.

The FANUC fibre laser works on a wavelength of 1,064 µm. Significantly faster cycle times can be achieved for sheet thickness less than 1 mm than with a CO₂ laser. Both options are neck and neck for sheet thicknesses between 4 and 5 mm. The CO₂ laser is in its element here. The speed

advantage is more pronounced the more rigid the overall design of the machine is. Here the CNC delivers optimal performances with short control cycles and interpolation times. With the introduction of the fibre laser, FANUC also accommodates the flexible beam guidance intended by the machine developers.

Its efficient handling of the energy used provides an argument in favour of the fibre laser. The current CO₂ laser from FANUC is already more economical with energy than its predecessor model, while the fibre laser converts 30 percent of the energy used to beam energy.

FANUC also offers an additional benefit with the "Robot Connection Function." Nothing could be simpler than integrating a loading robot in a system based on the FANUC CNC. Because communication with the robot is effected directly from the control system, a separate or additional interface does not have to be set up. Until now, the internal I/O link was enough for the data transmission when the communication and data exchange between drives and



servo amplifiers with the CNC were based on the FANUC FSSB Servo Bus.

The FANUC Corporation is a world leading manufacturer of CNC control systems and robots for factory automation, as well as production machines (Robodrill, Robocut and Roboshot). With more than 210 FANUC subsidiaries worldwide and over 5,200 employees, FANUC offers a close-knit network of sales, technical support, research and development, logistics and company care.

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A trinity of technology advancements for laser cutting of highly-reflective metals

Fonon Corporation recently announced three major hardware technology updates to its laser cutting systems: Direct Drive Motion System advancements, CleanCut technology and adaptive thin-to-thick laser beam shaping will benefit businesses that need to precisely cut highly reflective metals at production-level speed. An advanced, magnetic motion system and innovative laser advancements allow laser cutting systems such as the Titan FX to balance high acceleration, cut speeds and positioning with maximum accuracy. The Titan FX fibre is capable of cutting highly-reflective material such as copper, brass, and titanium, while processing common materials at speeds three to four times faster than CO₂ lasers of equal wattage.

Traditional flatbed laser cutting systems that rely on rack and pinion, ball screws, or belt drives to traverse the cutting head face limitations common to all mechanical, high-contact systems, including wear and tear of the gears, reduced belt tension over time and damage from the inevitable accretion of contaminants, grit, and dust generated by normal production conditions.

Fonon's Direct Drive Motion System uses direct drive linear motion technology, effectively levitating the cutting head smoothly and quickly across the working surface area.

"It's the same technology the U.S. Navy is testing to launch fighter jets from an aircraft carrier," says Jay Schlegel, vice president of Fonon Corporation. "The Titan FX's direct drive magnetic motion system allows for smoother motion, higher acceleration speed of the cutting head, less stress and vibration on the carriage frame, a lower system weight, and decreased maintenance requirements. There simply are no ball screws, belts or gears to deteriorate or break down."

CleanCut technology, the second advancement introduced by Fonon, is a technology improving the precision and slimness of the laser beam itself. Conventional laser cutting methods create an area of discoloration, potentially weakening and stressing the material on either side of a cut associated with an excessive heat affected zone. CleanCut technology reduces or eliminates the heat affected zone by producing a beam narrower than any conventional laser.

Adaptive thin-to-thick beam shaping technology automatically adjusts the laser beam's properties to process a wide range of material thicknesses. Built to take advantage of Fonon's deep understanding of the reflective characteristics of any given material when it reaches the temperature at which it transitions from a solid to a liquid or gas, Adaptive Beam Shaping provides economical operation, superior edge quality on thick plate and high-speed cutting of thin material.

Systems that make use of Fonon's new technologies, such as the recently-released Titan FX Series, typically experience a 10 to 30 percent increase in speed and accuracy and a 10 to 30 percent decrease in kerf loss over similar systems.

Manufacturers which cut and engrave highly-reflective metals will particularly benefit from the new advancements, particularly producers of construction equipment, aluminum vehicles, kitchenware, copper and brass gaskets, food processing equipment of any kind, and materials used in the aerospace and defence industries.



Fonon designs laser-based material processing technologies for advanced industrial manufacturing and manufactures state of the art equipment utilising those technologies. These products empower manufacturers in the areas of application-specific 3D metal printing (additive manufacturing), and 2D and 3D laser cutting, marking and engraving applications (subtractive manufacturing).

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Addison accelerates production of hygienic pipe reducers

A fully automatic Imet Sirio 370 AF-NC circular cold saw from Addison Saws is enabling Micron Stainless Steel Hygienics Ltd of Swadlincote, Derbyshire to accelerate production of its stainless steel pipe reducers.



A long-established supplier of high quality concentric and eccentric reducers for the dairy, brewery and hygienic processing industries, Micron required a solution that would speed-up the cutting of 316-grade stainless steel tube and, in doing so, free-up machine operators for other manufacturing processes.

Slicing cutting time

"Prior to purchasing the Imet Sirio from Addison Saws, it was taking as long as one minute to set up then cut each component from 1.5 inch to 4 inch diameter tube using our old semi-automatic saw," explains Micron's managing director, Michael Nemec.

Streamlining sawing process

"Our new Imet Sirio automatic saw easily accepts the 20-foot-long stainless steel tube lengths we use and has reduced cutting time to just 20 seconds per part," he adds.

"Furthermore, its 99-program memory is proving particularly useful, streamlining the cutting process further through the input of cutting lengths and the number of cuts required."

As Micron's manufacturing process favours flood cooling, as opposed to mist spray cooling, cut components are collected in a hopper for drying overnight, prior to deburring and finishing the following morning.

Bringing real benefits to Micron's production strategies

"It was especially rewarding to be able to show Micron Stainless Steel Hygienics how the Imet Sirio's capabilities would bring real benefits to their production strategies," adds Addison Saws' regional sales manager, Marcus Williams. "In view of its extensive capabilities, the Imet Sirio 370 AF-NC model is particularly keenly priced. Just like every new Imet saw we offer, it is also covered by a two-year manufacturer's parts warranty, with 12 months' on-site labour."

Highest levels of customer support

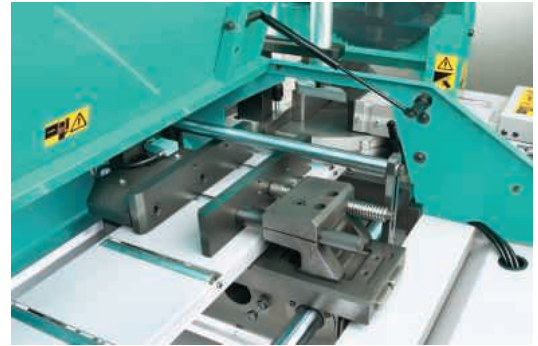
"Addison Saws demonstrated a thorough understanding of our sawing needs and helped us to find exactly the right solution," concludes Michael Nemec. "They were also exceptionally supportive as we integrated the new saw into our daily manufacturing regimes."

At-a-glance: the Imet Sirio 370 AF-NC automatic cold saw with NC ball screw incremental feeder

- For production sawing applications and general workshop use
- NC setting of the cutting parameters with 99 programs
- Optional inclined magazine automatic loader
- 520 mm stroke precision ball screw feeder
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- Pneumatic vice
- Anti-burr off-cut vice (90° cuts only)
- Electric flood coolant system

Addison Saws - leading the way in sawing technology since 1956

This year Addison Saws celebrates 60 years at the forefront of sawing technology.



Established in 1956, Addison Saws brought a new breed of metal cutting solutions to the UK and, in doing so, created a whole new market for bandsaws and circular saws.

Today, 60 years on, Addison Saws continues to lead the way in metal cutting technologies and offers an extensive range of full CNC machine tools, from the world's premier industrial machine manufacturers – all supported by uncompromising levels of customer care. The Addison Saws product range includes everything from simple, manually operated machines to highly sophisticated, fully automated sawing lines and has recently been increased with the addition of heavy duty 3, 3+1, 4 and 5-axis long-bed multi-piece machining centres. Addison Saws is part of the Addison Group, an organisation that also includes sawblade remanufacturing specialist Dynashape and tube-bending technology specialist, Tubefab.



Addison Saws

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Dealing with sealing

Tray sealing company turns to Prosaw once again for new stock plate cutting facility

Formed by directors Steve Malone and Robbie Hargreaves in 1998, Proseal has not only become the leading UK manufacturer of tray sealing machinery and tooling but is now recognised as a major force internationally.

The company's extensive range of tray sealing systems incorporates portable, semi-automatic, automatic in-line, as well as sandwich packaging systems, all of which rely heavily on key tooling components that are manufactured from aluminium or acetal copolymers stock plates.

The company is proud of its reputation for the outstanding quality, speed and reliability of its range of sealing equipment and demands the same high levels of quality from its suppliers, so it is of little surprise that Prosaw has recently commissioned their third sawing system within the last two years for cutting stock plates at Proseal's headquarters in Adlington in Cheshire.

Stock plates come in a variety of thicknesses. Those from 7 mm to 50 mm are

used for standard tools, plates up to 100 mm in thickness used for vacuum tools, while for acetal copolymer tools, plates up to 50 mm thick are required.

Unlike previous sawing systems supplied to Proseal by Prosaw, the latest addition is the first vertical bandsaw to be installed at the company's Adlington headquarters and was individually designed for Proseal to accommodate all possible thicknesses of their stock plate.

This latest sawing system has been specifically created with a health and safety perspective in mind. For example, an extra large bed is incorporated into the machine in order to assist the operator when loading bulky or heavy stock plates onto the machine. Additionally, the saw bed is fitted with surface mounted roller bearings to ensure smooth and easy manoeuvring of heavy plates once the plates have been loaded onto the bed.

Manufacturing manager, Paul Wilson says: "We are happy to have a very good ongoing



Cutting a stock plate to size

relationship with Prosaw and have been perfectly satisfied with both the quality of the systems and the excellent after sales service that we have received from Prosaw."

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New machinery strengthens steel reinforcement company

One of the largest metal works companies in the South West is stronger than ever with innovative new technology bringing unprecedented productivity to the business. Devoran Metals, based in Cornwall, is a leading supplier of steel reinforcement and associated products for concrete reinforcement.

Committed to embracing new technology, the company has invested in automated technology by purchasing a MEP Mini Syntax 16, the only machine of its kind in the South West. This machine allows the team to cut and bend steel reinforcement bars of any shape in an extremely quick and accurate production process. With reduced intervention of machine operators the investment has increased productivity within the workforce by 30 percent.

The pinnacle for Devoran Metals is the added value to its national customer base, that can now benefit from a wider range of standard and bespoke products, increased efficiency and fast production.

Richard Orsman, managing director at Devoran Metals says: "The Mini Syntax 16

has drastically improved our productivity, freeing up the machine operators to focus on our other areas of production including prefabrication. With a commitment to providing the latest and most innovative products, investment in this machine has been an obvious choice for our company. It will enable us to deliver the highest quality steel reinforcement bars cut and bent to any custom shape and most importantly, we are able to quickly respond to the needs of our customers."

The Mini Syntax 16 is the product of the best technology solutions developed in the field of coil processing, straightening and shaping, and with this the successful company hopes to see customer satisfaction continue to grow; orders have already increased 30 percent compared to last year.

Devoran Metals is the only Certification Authority for Reinforcing Steels (CARES) approved steel reinforcement company in Cornwall dedicated to producing high quality products with a focus on safety and reliability.



(Left to right) Maugan Thomas, foreman, Richard Orsman, managing director, and Jamie Bullen, steel operative with the Mini Syntax 16

As one of the South West's leading specialist suppliers of steel reinforcement and associated products for concrete reinforcement, Devoran Metals provides a complete package of products required for reinforced concrete.

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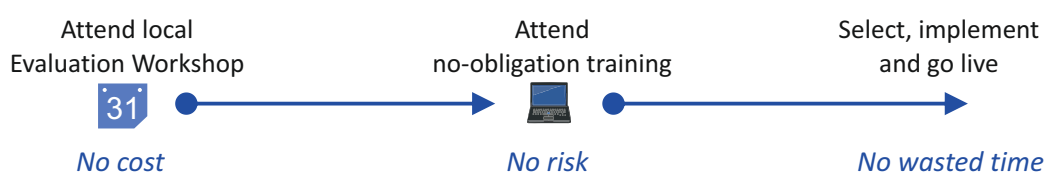
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