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The new Doosan DVF 5000 - our latest high-performance simultaneous 5-axis machine was one of the centres of attraction on our Stand at MACH.

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MACH 2018 REVIEW

5-AXIS MACHINING

CUTTING TOOLS

SAWING & CUTTING OFF

WORKHOLDING

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They came, they saw, it conquered

Latest Doosan DVF 5000 simultaneous 5-axis machine makes its MACH Show debut and pulls in the crowds

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, showcased 16 advanced high-performance machines on its stand at MACH 2018.

A number of the machines exhibited were making their debuts at the show and amongst these was Doosan's latest addition to its already impressive 5-axis machine tool portfolio - the DVF 5000.

As was the case with all the Doosan machines being showcased, the machine proved popular during MACH and its addition has helped further substantiate Mills CNC's position as a market-leading 5-axis machine tool provider.



Precision, speed, process reliability and flexibility accurately sum up the credentials of the new Doosan DVF 5000 machining centre

The DVF 5000 is a rigidly built machine and provides precision component manufacturers with full simultaneous 5-axis machining capability. The machine is equipped with a powerful 18.5 kW/12,000 rpm directly-coupled spindle, with an 18,000 rpm built-in spindle variation available as an option.

Initially the DVF 5000 will be available from Mills with the Heidenhain iTNC640 control. DVF 5000 models with FANUC and Siemens controls will be available later in the year.

The DVF 5000 boasts impressive rapid rates of 40 m/min on its X-, Y- and Z-axes to enable manufacturers to get down to business fast and is equipped with linear guides for improved accuracies. The machine features a 500 mm x 450 mm table with a maximum table load of 400 kg but can be supplied with a larger table of 630 mm x 450 mm if required.

To improve productivity, the DVF 5000 has a servo-driven ATC that can hold up to 120 tools with a 1.3 second tool-to-tool changeover time.

Tony Dale, Mills CNC's technical director says: "Precision, speed, process reliability and flexibility accurately sum up the credentials of the new Doosan DVF 5000 machining centre.

"Judging by the positive reception the new machine received at MACH, I am confident that the DVF 5000 will become a 'must have' machine for component manufacturers looking to improve their productivity, performance and profitability."

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The LOGIQ of machining intelligently in the era of Industry 4.0

John Barber reports from the ISCAR Tools LOGIQ product launch in Birmingham

Iskar Tools has an enviable reputation for innovative tooling solutions for turning, hole-making, gripping and milling. In March, Jacob Harpaz, CEO of the IMC Group, unveiled the company's new product range whilst providing his own insight into the technological advances that the products provide.

Addressing customers, colleagues and members of the press at the event Jacob Harpaz said: "Since 1952, we were one of the fastest growing companies as a cutting tools manufacturer. 2017 was a record year and everyone was surprised to see what happened in the second quarter of last year. Nobody was prepared for such demand."

Industrie 4.0: from hype to reality

Jacob Harpaz continued: "Industrie 4.0 is a nice slogan, no doubt, but what actually is Industrie 4.0 besides the slogan?"

It is likely that the world of production will become more and more networked until everything is interlinked with everything else. The driving force behind the Internet of Things (IOT) also means that the complexity of production and supplier networks will grow enormously. The interlinked networks within ISCAR's production and marketing systems ensure superb service and products to its customers, increasing overall cost effectiveness. To assure maximum engineering compliance, ISCAR has already connected its production facilities around the globe to achieve standardisation. The

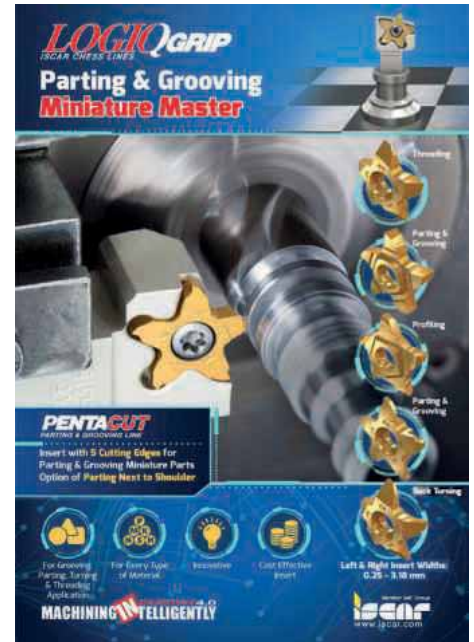
stringent methods applied guarantee that customers receive equally high-grade tools and inserts at any location.

There are significant differences between a typical, traditional factory and an industry 4.0 factory. In the current industry environment, providing high and quality services or products with the least cost is the key to success. ISCAR applies smart factory environments in all of its production centres around the globe. The advanced, automated systems assure redundancy in production which, in turn, provides the winning edge and cost-effective solutions for its customers.

ISCAR has connected its production lines and automated warehouses to the cyber space. Cyber space connectivity enables controlling ISCAR's production and business environments by providing highly advantageous solutions to its customers. ISCAR'S research and technological development engineers represent the core of the company's vision for ongoing tooling innovations. ISCAR's new product design and development yield ongoing benchmarks which become the trendsetters of the metal working industry.

As well as the main R & D division at the ISCAR headquarters, the company has specialised R & D units around the world to meet the unmet needs of its customers. Jacob Harpaz says: "Four to five percent of our annual revenue is continuously invested in R & D which guarantees productivity in the cyber age."

ISCAR aspires to produce future oriented tools which answer to the new era of the 4th industrial revolution. The company's new smart factory philosophy adopts advanced production methods, where 3D printing is an integral part of its production processes. 3D printing is another added advantage



brought to the customer assuring high quality products and lower costs.

ISCAR's production floors apply cyber intelligent robots controlled by computerised systems with artificial intelligence. The smart processes reduce production costs while delivering high quality and cost-effective solutions to the customer.

Technology is the only enabler that will lead to better decisions, more efficient processes and new business models.

Jacob Harpaz said: "A large percentage of people may need to switch job by 2030. It is happening already. Things are changing. In Israel we have around 3,200 employees. 10 percent of these are I.T people. We have around 300 people working in our I.T department. You can see where the change is happening and the direction in which the industry is moving."

Where the innovation never stops

ISCAR prides itself on being at the forefront of innovation and its impressive new product line is testament to that. The company launched the LOGIQ campaign to introduce a new standard in cutting tool excellence. Jacob Harpaz said: "40 percent of our annual revenue is derived from new



products and new projects. The company is working closely with industry and very closely with machine tool builders.”

As an acknowledged industry leader and innovator in the field of metalworking, ISCAR has taken the company’s IQ concept of machining intelligently even further by applying a range of advanced logical development to cutting tools. The result is the pioneering LOGIQ range of tooling solutions that both predicts and fulfils customer needs. LOGIQ represents a smart, logical progression in a series of strategic moves to implement INDUSTRY 4.0 machining standards while ensuring continuity and stability.

The application of LOGIQ has allowed the creation of advanced new tool families, enabled existing lines to be upgraded and inspired innovative product ranges that assist users in maximising equipment utilisation and optimising performance.

LOGIQ’s unrivalled, out of the box tool innovations include progressive new cutting geometries and robust locking mechanisms that guarantee stable, vibration free machining with superior repeatability. New LOGIQ indexable inserts are equipped with sophisticated chip formers and also feature innovative geometries that enable soft cuts to be achieved at high feed rates.

New solid carbide tools have been developed with inventive designs that feature substantially increased anti-vibration characteristics, a key factor for boosting productivity in unfavourable cutting conditions. The latest cemented carbide grades reflect ISCAR’s forward looking philosophy and know-how in powder metallurgy and coating technologies. The LOGIQ toolholding line includes new heat-shrink-fit and vibration-dampening devices which significantly improve performance in areas where tool rigidity is a critical parameter. New LOGIQ milling solutions include strong, durable inserts and milling heads with improved capabilities.

LOGIQ turning applications offer a range of new solutions that enable a decrease in

machining loads. They allow the production of thinner and wider chips and also help to resolve vibration issues and improve coolant flow capabilities.

LOGIQ CHESS Line

ISCAR has done it again by revolutionising parting and grooving application. In the world of Industrie 4.0, where every second makes a difference, only machining logically will guarantee winning results.

Grip systems

The new TANGGRIP insert is able to perform parting at very high feed rates on conventional X-axis machines by use of the TANG 4 grip blade. PENTACUT is a new five corner insert for machining miniature parts. The unique shape and design of the insert rekindles this legacy insert by opening new frontiers for additional applications. The insert and toolholders enable the machining of miniature parts with right and left capabilities next to the shoulder of the workpiece. ISCAR has introduced a new SWISSCUT long insert combined with a compact tool for deep grooving on Swiss-Type machines. The insert is long and easily performs parting and grooving. The insert can be clamped from both right and left sides of the tool, consequently providing great savings in tool inventory. It can also be extracted from the tool if the tools sides are blocked.

Turning

ISCAR has taken logical turning to new horizons by providing cost-saving and high productivity innovations. With JET-R-TURN, ISCAR has expanded the JET turning line by introducing new holders with a newly designed through coolant rigid clamp and tool body. This new line of tools is suitable for high and standard coolant pressure options. WHISPERLINE offers the ultimate solution for overcoming chatter and vibrations. The boring bars feature a unique, integral absorber which suppresses cutting tool vibrations. The absorber mechanism provides optimal surface finish and a soundless turning application

Milling

Among the many products in the milling line are SOLIDMILL and MULTI-MASTER. SOLIDMILL is a high feed ceramic endmill for cost effectiveness and high productivity. ISCAR’s long flute MULTI-MASTER heads provide a length ratio of 1.5 x the tool diameter. The heads have longer cutting



edges which enable roughing, semi-finishing, finishing and provide excellent ramp down capabilities. ISCAR has introduced MULTI-MASTER exchangeable heads for face milling. These small heads are highly-efficient and suitable for creating small cavities and enable working in limited spaces on small milling and mill-turn machines.

The all-embracing LOGIQ line encompasses many other ISCAR tool families, comprising hundreds of new products, each designed and developed to perform essential tasks in the most efficient possible ways. From concept to realisation, LOGIQ-inspired tools reflect ISCAR’s on-going commitment to creating and delivering high quality products that contribute to increasing users’ productivity and profitability.

The fourth generation of the Industrial Revolution demands further improvements in production efficiencies and new standards in the machining of metals. The latest LOGIQ developments ensure that ISCAR is at the forefront of this important industry trend.

Jacob Harpaz concluded: “Machining logically means machining intelligently. The LOGIQ product line is no doubt innovative and is unlike any other.”

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Subcontractor develops world's fastest Mini with redesigned motorcycle engine

Pocket Rocket goes even faster with hyperMILL

When Vetech Product Design & Development Ltd first opened its doors for business in 1994, the founders of the Buxton Company exploited its expertise in the garden equipment sector to win business from the globally recognised Bosch brand. Providing design, consultancy, subcontract manufacture and mould & die tooling, the Derbyshire business has retained Bosch as a core customer whilst branching into the military, general subcontract, electronic sensor and plastic moulding sectors.

This diversification has been a welcome respite for a business that has noticed a dip in European business during the Brexit process. Not a business to rest on its laurels, Vetech has applied its expertise to the motorsport sector, converting the Suzuki Hayabusa motorcycle engine for use in the Mark I to VII Mini motorcar produced from 1959 to 2000. It is here the expertise of CAM developer OPEN MIND Technologies has come to the fore.

The subcontract company has a plant list that includes manual and CNC machining centres, injection mould machines and test facilities. Part of the acquisition trail includes a Hurco VMX42M and a VMX30Ti machining centre with the larger VMX42M being retro-fitted with a Hurco 4th axis rotary unit two years ago. Designing and manufacturing complex aluminium mould tools, military sensors and the innovative Hayabusa engine, the previous CAD/CAM system was struggling to cope with component complexity.



hyperMILL brings anti-collision confidence to Vetech

Commenting upon the situation prior to the arrival of OPEN MIND's hyperMILL CAM system, Vetech's senior design engineer, Andy Smith said: "Our longstanding CAD package had an integrated CAM system we were using for all our machining tasks. One day we machined a mid-housing part for our Hayabusa engine and the VMX42M did a rapid traverse between two points, crashing into our fixtures and ruining the spindle. The result was weeks without the machine whilst we installed a costly new spindle. The lack of collision detection was a major cause for concern. We then programmed a gear selector barrel that was almost impossible with our old package. We needed to change our CAM software and invited all the leading vendors in to present to us."

Vetech gets into gear with CAM selection

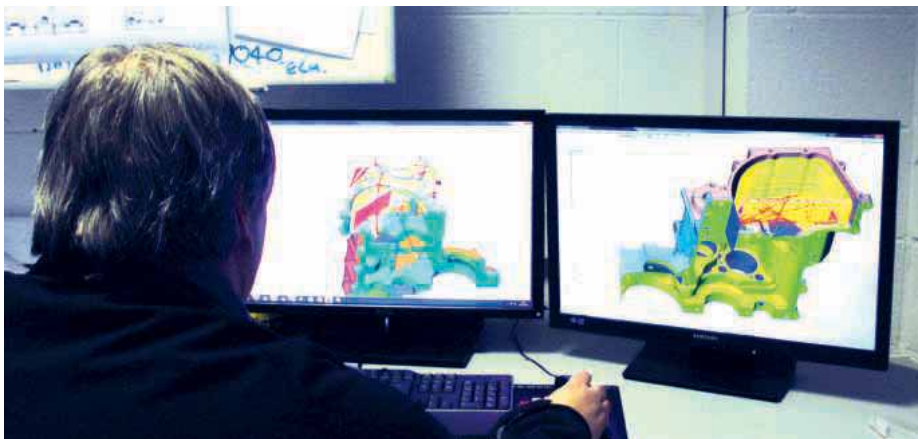
Being an extremely experienced CAD/CAM designer and programmer, Andy Smith has in-depth experience of all leading CAM packages, coincidentally being one of the first UK engineers to be trained on hyperMILL in the mid-1990's during his previous employment at The Hyde Aerospace Group.

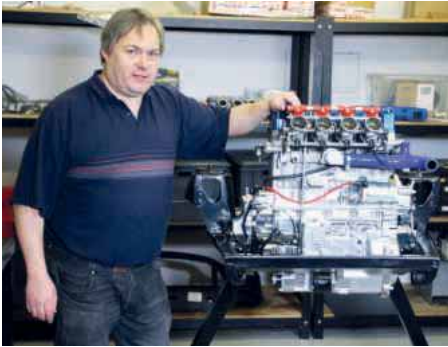
Andy Smith says: "Redesigning and remanufacturing the Hayabusa 1300cc engine to fit into a Mini meant we had to reposition the gearbox and add a reverse gear. I gave the gear selector barrel to all the leading CAM vendors and asked them to program it."

Matthew Coulson from OPEN MIND provided the most efficient and productive solution with an intuitive presentation that detailed the benefits of hyperMILL over its competitors particularly well. Due to our previous experiences, collision prevention was a critical factor, something OPEN MIND certainly convinced us of. Furthermore, we needed to achieve faster programming times for our aluminium mould tools; hyperMILL was once again streets ahead for mould tool programming."

The Hayabusa Project

Reengineering the Suzuki Hayabusa engine is undoubtedly an impressive feat of engineering that has genuine purpose. Once the power unit for the world's fastest production road bike; the Hayabusa engine





is a compact and powerful powertrain unit that can fit straight into the classic Mini whilst offering reliability despite the massive increase in performance. Such reliability is a rarity for any classic car.

The repackaged engine has seen the Vetech engineers retain many of the power producing components of the original Hayabusa. However, the conversion has seen the Peak District Company add internal final drive gears and a differential, reposition the gearbox beneath the engine and crucially add a fully integrated reverse gear. The engine has been turned back to front. The repackaged engine/transmission has 'universal' engine mounts; bespoke mountings have been designed and manufactured for the mini but the engine mounting bosses provided permit easy integration into other vehicles such as the Fiat 500 or Lotus Elise.

What does all this mean for the Mini enthusiast?

Even the most powerful production Mini variant ever only developed 96 bhp, although the vast majority of minis only developed around 65 bhp or less. An exceptionally highly tuned model can generate upwards of 120-130 bhp, but with very low reliability as a consequence. The Hayabusa engine has a power output of 197 bhp as standard and when re-packaged by Vetech, it weighs just 100 kg. This is a 32 percent engine weight reduction over

the original unit. For those with an inclination for seemingly jet-propelled speed, Vetech also offers a super-charged 300 bhp unit.

The fastest Mini in the world?

During the development phase of the Vetech Hayabusa project, Vetech entered the 2016 'Fastest Mini in The World' Race at Brands Hatch. Starting in last position on the grid, the power to weight ratio propelled the car to second position in just three laps, only failing to win the race due to a water-pump problem.

Programming the 11 core components of the remodelled engine with hyperMILL, Vetech has certainly benefitted from the CAM system. Andy Smith continues: "Programming and machining the Hayabusa project is not time-critical, what is important for us is the ability to program and machine complex parts with confidence in the collision avoidance system. OPEN MIND has completely modelled its work envelope into the CAM system with fixtures, machine spindle, toolholders and the Hurco 4th-axis rotary table all factored into the model. hyperMILL stores a complete library of toolholders and tools, so we have 100 percent confidence in the anti-collision system. From a time-reduction standpoint, we programmed an aluminium mould tool for Hayabusa inlet and exhaust caps. With our previous system it took 20 hours to program and with hyperMILL this same tool was completed in less than 10 hours."

Cutting machining times with hyperMILL

The upper housing of the engine consists of seven individual setups. With its previous CAM package, Vetech couldn't carry the stock model from one process to the next. As Andy Smith continues: "Without the ability to carry the stock model forward to the next setup, we would have to manually jog through the cycle on each setup to



minimise non-cutting times or run the program and wait for the tool path to finish 'fresh-air' cutting. The Stock Model feature within hyperMILL eliminates fresh-air cutting and enables us to maximise machine utilisation at every setup. This makes huge savings on complex parts with multiple setups."

With over 60 percent of Vetech work consisting of aluminium mould tool production, the manufacturer programmes the tool core and cavity with hyperMILL and simultaneously machines the two mating tool components overnight on the two Hurco machines. Efficiently machining core and cavity overnight, the majority of staff hours are consumed in the programming process. To reduce the lead times, Vetech has invested in two hyperMILL seats, so one team member can program the core whilst another programs the cavity. "We undertake prototype design, development and testing work on lawnmowers and there is often an urgency to respond to the customer. In most cases, we are expected to design, program and manufacture the mould tool, cavity and core, and then mould the plastic prototypes and conduct thermal and stress tests within 3-4 days. To achieve this, our programming and machining times have to be extremely efficient."

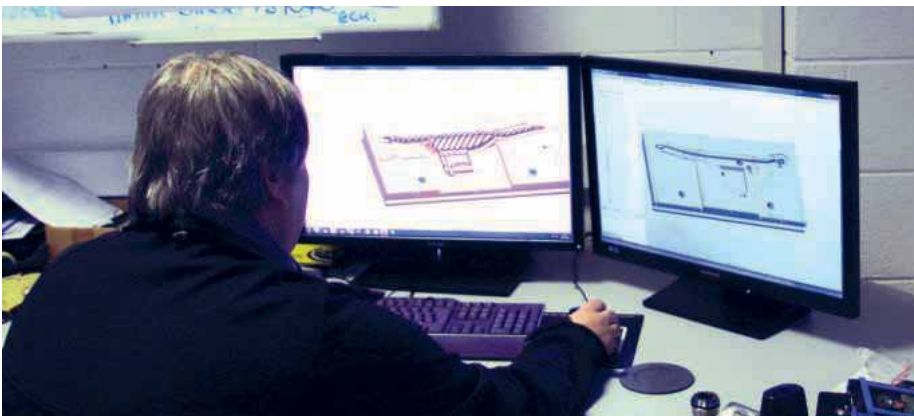
Andy Smith concludes: "hyperMILL has slashed off-machine programming times as well as on-machine cycle times. It has also improved the quality, surface finish and consistency of our parts and mould tools. OPEN MIND has achieved all of this whilst giving us 100 percent confidence the machining strategies and toolpaths, something that is credit to the exceptional anti-collision system in hyperMILL."

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Güdel's articulate gantry keeps axle production moving

Güdel's Gantry Robots have established a reputation for performance and reliability, particularly in applications where large, heavy components need to be transported accurately over long distances.

In a recent project for Midlands-based MTI Welding Technologies Ltd, Güdel UK provided the Gantry Robots which are at the heart of an automated cell used to friction-weld axle sub-assemblies for articulated trailers.

The production cell, designed and built by MTI Welding Technologies at its Kingswinford site for a German customer, integrates the company's world-leading double head friction-welding technology with two Güdel gantry robots, a machine vision system and a series of product conveying/handling systems.

Each axle sub-assembly comprises of three individual component parts: the main axle tube which is 1.4 m long; 150 mm in diameter and weighs 70kg and two steel forged and machined spindle hubs, which each weigh 18 kg. The tubes are presented to the main gantry on a Güdel supplied infeed conveyor. They are then located and radially orientated, before being picked up by the Güdel ZP5 2-axis gantry robot which loads them into the double-head MTI friction welding machine. This robot spans the complete cell and has dual heads, one at the load side and the other at the unload side of the system.

Also, within the manufacturing cell is a smaller, 4-axis Güdel FP3 gantry robot which is used to pick the spindle hubs from trays. The parts are then radially orientated using an integrated machine vision system, and loaded to a specially tooled pallet conveyor system which transports them to the main gantry, used to load the welder. Both left- and right-hand spindle hubs are loaded to the conveyor system which transports them to the main gantry robot ready for collection. The main welder loading gantry then picks the spindles up, alongside the axle tube it picked previously, allowing it to load all three parts simultaneously into the friction-welding machine. The robot places the main axle tube to the welder clamp system, to retain the radial orientation, before loading each spindle hub to a collet chuck. This dual head concept on the main gantry robot



optimises the unload/load time between machine cycles, allowing a completed assembly to be produced by the system every 70 seconds.

Meanwhile, a second head on the ZP5 robot unloads a completed assembly from the friction welding machine, moving it to the Güdel-supplied output conveyor and allowing a fresh set of three individual parts to be loaded ready for the next welding cycle.

In addition to the ZP5 and FP3 Gantry robots, Güdel UK also integrated the Siemens control system to the robots and designed and manufactured the component gripper systems. This is another example of Güdel UK working together with a specialist machine-builder to provide a fully integrated solution for the end user.

Güdel UK Ltd is the United Kingdom subsidiary of Güdel Group, a global manufacturer of robotic automation products, systems and services. Güdel supplies linear motion modules, robot track motion units, gantry robots and components to OEM's system integrators and machine builders serving the automotive, aerospace, logistics heavy industrial and power generation industries. Güdel Lineartec UK Ltd is based in Coventry, at the heart of the UK's manufacturing base, and provides a comprehensive range of services including: design, engineering, system build, customer support and service.

Güdel's linear motion components can be configured as single or multi-axis modules. When mounted in an elevated position, these multi-axis units are referred to as Gantries. When a control system is integrated, these modules become a powerful and highly flexible Gantry Robot. With options ranging from a single axis up to five axes, and the potential to have more than one multi-axis module mounted to a single Gantry. Güdel can find solutions to even the most challenging applications.

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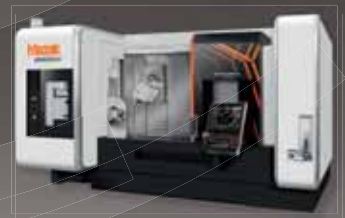
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Sodick machine brings wire EDM in-house at automotive toolmaker

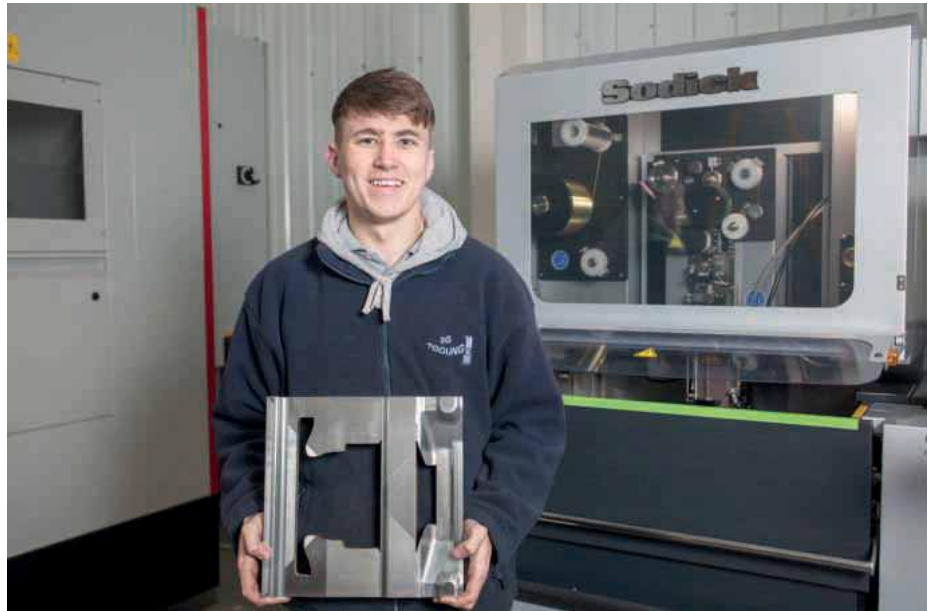
Warwickshire-based 2G Tooling, a specialist in precision press tooling for the automotive industry, is leveraging the benefits of a Sodick VL400Q from Sodi-Tech EDM to bring in-house previously outsourced wire-erosion capabilities. As well as the savings this strategy has delivered, the investment is also allowing the company to reduce lead times and impart greater control over important business functions such as scheduling and quality.

Based in Southam, close to the heart of the UK's automotive sector, 2G Tooling is building on an impressive start to life after the company was founded by brothers Chris and Jon Peters in 2013. Although Jon Peters is a silent partner, Chris Peters has 30 years' experience in the industry as a time-served toolmaker and business manager. Beginning with just one vertical machining centre, and working at nights and weekends, 2G Tooling soon evolved into a full-time concern. With more machine-tool capability soon arriving, the recent requirement to invest in the latest wire EDM technology seemed a natural progression.

Chris Peters says: "We were receiving more and more enquiries for the cutting elements of press tools, such as punches and dies, especially ones capable of the high volumes required in the automotive industry. Manufacturing punches and dies benefits from the capabilities of EDM, but we were subcontracting this requirement. However, with the ongoing success of the business, we had reached the stage in our development where we could afford to bring wire EDM in-house."

Chris Peters scrutinised three major vendors of wire-erosion technology, opting for Sodi-Tech EDM as a result of the whole package solution available.

Chris Peters says: "Beyond the price and performance, it was important that we found an EDM partner able to provide exemplary service and support. We are a small business with only one EDM machine, so response times are key. Since the machine was installed in April 2017 we have only had one issue, a timing problem with an interlocking guard, but Sodi-Tech sent out two engineers who sorted it immediately. Having that peace of mind is invaluable."



Another factor that heavily influenced the purchase decision was the build quality of the Sodick VL400Q.

Chris Peters continues: "We had a series of trials on the machine and could see immediately the quality of the machine's construction. As a small business I am still relatively hands-on, so I notice these things. I could also see that attention had been given to ease-of-maintenance. Overall, the machine was miles ahead of lower-priced machines on the market, and significantly better than many higher-priced ones too."

The learning curve for the new Sodick machine proved extremely short, with just half a day training for Chris Peters and three days for one of the company's apprentices. Both programmes were delivered by Sodi-Tech EDM. The apprentice now runs the machine.

Press tool punches and dies manufactured on the Sodick VL400Q are used to produce automotive body-in-white (BIW) panels for "all the major OEMs". Made from hardened tool steel, accuracy between the top and bottom (clearance) is normally in the region of 0.05 mm, which Chris Peters says is "achieved without problem" using the Sodick machine.

Chris Peters adds: "Furthermore, the surface finish capability is second to none, while the really tight corners produced by the machine are perfect for complex punch

and die manufacture. Using less capable or older technology would require hand-fitting or diamond filing to achieve the required corner profile, but not with the Sodick VL400Q."

Despite being a secondary process machine for 2G Tooling, the Sodick VL400Q has been working almost constantly since its installation. This medium-sized model features Sodick's Linear Motor Technology and is ideal for a wide range of machining applications.

Chris Peters concludes: "It's not so much about what the new machine has saved, but what it brings. We design in-house, so we design all of our tools, jigs and fixtures around what we have. Now that we have the Sodick VL400Q, we can offer a lot more design capability. There are a lot of machine shops in the Midlands, but a diminishing number of toolmakers, largely due to the high level of skill involved. Knowledge is our USP, and this is increasingly supported by a growing number of machining processes at 2G Tooling, including milling, turning, grinding, and now, wire EDM. Quality, on-time tooling is always at the forefront of what we strive to achieve."

For over 30 years Sodick has been manufacturing EDM machines. As an industry leader, it is committed to the highest quality standards. For Sodick, this commitment does not stop at sales, but

applies equally to providing advice and support in all the technical aspects of applications, training, customer and after-sales service. Consequently, it provides customers with services on all aspects of EDM machining quickly, and in a manner best suited to individual's needs, throughout the world.



Sodi-Tech EDM Ltd is the exclusive distributor of Sodick EDM products in the UK. A wide range of Sodick wire-cut and sink EDM machines are on display at its large showroom in Coventry, West Midlands. The site is easily accessed, sitting as it does at the hub of the midlands motorway network.

The company has an experienced team of regional sales engineers who can help customers decide on the right value-for-money product available, backed up by a specialist team of application engineers. They are on hand to demonstrate each machine's capabilities, ensuring that your final choice will suit the type and quality of components that you wish to manufacture.

It also boasts a high level of after sales service and support, offering a comprehensive range of genuine consumable items that ensure each purchase maintains its accuracy, speed and quality of finish for the duration of its working life.

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5-axis machining centre halves cycle time

Hailsham, East Sussex-based subcontractor, Dicker Precision has decided to move its prismatic machining capability forward with the purchase of its first 5-axis, vertical-spindle machining centre (VMC). It is a German-built Spinner U620 Compact, supplied as a turnkey package with tooling, the initial part program and training by UK and Ireland agent, Whitehouse Machine Tools, Kenilworth.

Deputy systems manager Brandon Love, son of the subcontractor's second-generation managing director Mark Love, explains the reason for buying the machine in January 2018 and why the firm opted for a model capable of interpolating four of the five CNC axes simultaneously, rather than all of them; "The investment was triggered about a year ago by one of our existing customers asking for nine variants of a pump housing to be machined from solid 316 stainless steel. Some features have tight tolerances, such as 30 microns on hole diameter and 20 microns on position.

"We started off machining them on a 3-axis VMC using indexable-insert boring bars, high-speed steel rippers and various other tooling including taps. It took four hours to complete each housing in five operations. Quite frankly, we were finding it difficult to make any profit on the contract.

"However, unlike the other stainless-steel pump housings we manufacture for this company, which are produced from castings that need to rest before operations to relieve internal stresses, the latest components are produced from billet, so we realised we could machine them in two operations."

To make this a reality and improve the economy of production, however, either a 5-axis VMC or a 4-axis horizontal machining centre was needed, and both were



considered. The vertical-spindle route was chosen due to the greater versatility that it offered for future contracts and also the smaller footprint for a given working volume. In this respect, the Spinner machine has a particularly good ratio.

Luckily, the quantity of the new pump housings rose during last year to between 20 and 40 per month, which justified the purchase of a new machine. Dicker Precision already had experience of working with Whitehouse Machine Tools, which had delivered an Italian-built Biglia twin-spindle CNC bar auto with two Y-axis turrets to the Hailsham factory to streamline the production of a family of aluminium switch cover assemblies.

Brandon Love says: "Whitehouse provides a turnkey solution. They do everything for you, whereas some suppliers just deliver a machine and you're lucky if they tell you how to turn it on and off. We looked at various options but the positive experience with the Biglia lathe package prompted us to return to the same source for the 5-axis machining centre.

"Whitehouse did a time study on the first part, wrote the program and advised that the job could be done twice as fast with solid carbide end mills rather than indexable-insert tooling, in two hours rather than four, including handling.

"Feeds and speeds were optimised. It recommended that threads be milled rather than tapped to avoid the risk of tap breakage and consequent machine downtime and scrapped components and offered to visit to set up the job and train us, which was important as it was our first 5-axis machine."

The U620 Compact was producing the pump housings within two days of arriving on the shop floor. Based on the machine's hourly rate, halving the cycle time results in

£200 being saved on the production of each component. Admittedly, £60 was spent on carbide inserts for each component whereas the tooling cost is double using solid carbide, but nevertheless the reduction in manufacturing cost is considerable and will help to amortise the cost of the machine quickly.

It should be pointed out that the savings described are gained only from Op 1 on the top of the housing, a 3-axis VMC being retained for the simpler, 15-minute Op 2 on the reverse.

Unsurprisingly, owing to the reduction in the number of operations, lead-time from start of production to delivery of a batch is down from one and a half weeks to three days, with two days the aim. Another big advantage is the repeatability of the process, which is largely down to the rigidity of the Spinner machine and the absence of tolerance build-up.

It has elicited a comment from the customer that the current components are of significantly better quality. All housings delivered were within tolerance before, but some might have been near the top or bottom limit, causing niggles during pump assembly. Now dimensions are all close to the centre of the tolerance bands, making life easier for the customer.

As to the choice of a 4+1-axis version of the U620 Compact, where one of the rotational axes is positional only rather than capable of being interpolated with the other four, Brandon Love explains: "One factor was that the 4+1-axis machine costs around 15 percent less than the full 5-axis version. In any case, we are currently using ours in



3+2-axis mode to manufacture the pump housings.

"That will soon change, however, as we are planning to introduce a two-minute chamfering routine into the Op 1 cycle, which will require simultaneous movement of four axes. It will eliminate hand deburring



after machining, saving up to 10 minutes per part and the consequent labour cost, as well as avoiding the variability of manual processing. We also intend to introduce in-cycle chamfering during Op 2 on the 3-axis machine."

The latest pump housing contract occupies the Spinner for half of its time over a single day shift, so there is spare capacity. The next job is already lined up for the machine, an aluminium pneumatic block for the automotive industry that requires five-sided machining. Similar jobs have been done in the past by Dicker Precision but it has been difficult to hit the price asked. That will be no problem using the 5-axis machine, according to Brandon Love: "More and more jobs these days have tighter tolerances and require a higher standard of surface finish. Machines like the Spinner help us to achieve the specifications.



"Moreover, the reduction in handling resulting from automatic part repositioning on the 5-axis machine means that an operator can look after a 3-axis machine as well, reducing costs further."

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Citizen adds LFV technology to higher speed Cincom for smaller diameter work

Citizen Machinery has further developed the programmable application control of chip size through its world-leading Low Frequency Vibration (LFV) cutting technology by applying it to the 12 mm capacity Cincom version of the popular L-Series. The 5-axis Cincom L12-VIII LFV incorporates high spindle speeds of 15,000 revs/min to maximise performance on smaller diameter work in a compact machine requiring just 1,760 mm by 820 mm floor space.

Available through Citizen Machinery UK, the Cincom L12-VIII LFV can also be specified with a 16 mm capacity bar size option to extend the capability and maximise productivity from the in-built rigidity of the design to accommodate LFV technology. These include special build standards, slideways, bearings and ballscrews plus control and software.



The 5-axis Citizen Cincom L12-VIII LFV incorporates high spindle speeds of 15,000 revs/min in a compact 1,760 mm by 820 mm floor area

LFV cutting technology enables precise programmable control of chip size while eliminating deflection on very small diameters when turning. LFV can also be selectively applied to drilling, grooving or even thread cutting plus providing an important aid to machining difficult materials from plastics and copper to high alloy steels. Through the high speed Cincom control, the servo axes in X- and Z- can be selected to provide independent rapid oscillation of the cutting tool, creating in effect, air gaps in synchronisation with the rotation of the spindle.

The machine features a 3.7 kW 15,000 revs/min main and 0.75 kW 10,000 revs/min sub-spindle, a removable guidebush assembly for economic bar usage on shorter components, with a guidebush stroke per



The Citizen Cincom L12-VIII LFV can accommodate up to 27 tools and can be specified with 16 mm bar capacity

chucking of 135 mm. Rapid traverse rates are fast at 35 m/min to minimise non-cutting positioning times.

Up to 27 tools can be carried on the machine X1-Y1 gang toolpost comprising six as gang turning tools, between four and nine gang-driven tools powered by 0.75 kW 10,000 revs/min motors and four front and four back gang drilling tools. The back X2-Z2 toolpost holds a further four driven tools powered by 0.5 kW 9,000 revs/min motor. Deep hole drilling can also be accommodated on the opposite toolpost.

Citizen also provides tooling options on the gang toolpost of three double ended spindles for end face drilling with a 30 deg swing adjustment, an outer diameter milling spindle and a vertical four position tool holder. The back toolpost can also carry an option of an outer diameter milling spindle and a slitting spindle with 30 mm diameter cutter capacity.

Access to the working area is aided through a wide, lift-up cover. Workpieces from the sub-spindle are unloaded into a chute with conveyor to prevent damage and up to 100 litres of coolant is held in an easily removable tank.

Citizen launches Cincom D25 sliding headstock turn-mill centre at MACH

The next generation of Citizen's advanced CNC system featuring touch screen and qwerty keyboard was launched at MACH 2018 as a key feature on the new Cincom D25-VIII and -VII sliding headstock turn-mill centre. Operational flexibility is maximised for complex cycles with two gang vertical toolposts each with X-, Y- and Z- axes and

one with a B-axis capable of both front and back machining. In addition, there is a back toolpost and opposite toolpost with a tool capacity of up to 59 tools, with the added advantage of removable guide bush for more economic material use on shorter components.

The Cincom D25-VIII is configured as a 10-axis sliding headstock 25 mm capacity machine which also incorporates the added flexibility of 0 to 135 deg swivelling B-axis. This swivel axis is incorporated within the first (X1, Y1, Z1) axis gang toolpost capable of holding four double-sided driven spindles to service both the main and sub-spindles.

In addition, a second gang toolpost (X2, Y2, Z2) is able to work independently or simultaneously with the (X1, Y1, Z1) toolpost to overlap for instance, rough or finish turning operations or apply in unison, drilling or milling based cycles.



Citizen Cincom D25 sliding headstock turn-mill centre features new generation control, triple Y- and Z axes plus B-axis swivel



Citizen's Cincom D25 has 10-axes controlling two gang vertical toolposts plus back toolpost and opposite toolpost

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Fairbrother and Grimshaw make light work of heavyweight applications with Harrison Alpha CNC lathe

Soon after taking delivery of a Harrison Alpha 1550XS CNC lathe during summer 2017, Fairbrother and Grimshaw has seen its growing reputation spread even further, resulting in an upturn in orders, utilising the Alpha lathes versatility for taking on larger capacity mill/turn jobs.

Fairbrother and Grimshaw is a Lancashire subcontract engineering business that specialises in CNC milling, turning and boring, from its facility in the Cherry Tree area of Blackburn. The company has a large, loyal customer base, working across industries including paper, automotive, plastics and food, and prides itself on project engineering for its customers and not just making subcontract parts in volume.

Director of Fairbrother and Grimshaw, Neil Grimshaw says: "When our customers contact us, they are looking to solve production issues, so understanding the application and how it works is important for both parties, so in many cases, we encourage our engineers to either improve the parts made or improve the process involved."

Relationships are also key to its continued success where regularly, production staff are encouraged to get involved with the customer to see the application first-hand, so continued improvements can be made more easily.

Neil Grimshaw says: "We are firm believers of pushing what we do with current technology and standing still is not an option for us. We ask our workforce to be the best in everything they do and that means investment in recruiting and training apprentices to ensure that our skills are passed on. The Alpha manual/CNC lathe is



ideal in that sense as it is an easy switch from turning manually to using the Alpha with the minimum of training.

"We already have some Colchester manual turning machines as well as a range of VMC's and CNC turning centres from many suppliers, but the large capacity turning applications were difficult for us to manage. The Alpha XS has helped us raise the bar and added a different dimension to our turning capability. This, in turn has already helped spread our reputation and we are taking on more work because of it."

The 2 m between centres Alpha 1550XS has a generous swing over bed of 554 mm and a 104 mm spindle bore and with its large 15 kW motor. This means that the 1550XS spindle speeds can reach up to 2,000 rpm.

Neil Grimshaw says: "When we purchased the Alpha, we also made use of its range of accessories, including steadies, morse tapers and four jaw chucks, to give us the maximum flexibility to our work for customers.

"We had a batch of rollers to make for our paper industry customer where we were asked to achieve a surface finish of N6 or better, where we had a couple of jobs where we struggled with our existing manual machines. However, after buying the Alpha and working with our tooling supplier, who

suggested cutting tips that allowed us to actually achieve an N2 finish, which was also achieved throughout the whole batch. The stability and accuracy of the Alpha lathe means that every piece is identical from start to finish.

"We did consider other lathes but, once we saw the Alpha, there was never any doubt in our minds as no other competing product could match the combination of flexibility, accuracy and value for money. The added bonus with the Alpha is that you can choose which mode you want to work in and that the FANUC Oi-TF control is totally compatible with many of our other turning machines, so that we can switch jobs if needed.

"We also manufacture mixer shafts for an automotive customer and this was all done on a manual machine, but it is so easy to program, redesign and store improvements on the Alpha, taking component manufacture to the next level."

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Large, gantry-type machining centre from DMG MORI

A powerful, dynamic, compact machining centre said to be universally applicable across the aerospace, mechanical engineering and die & mould sectors has been introduced by DMG MORI. The DMU 340 Gantry has a stable, one-piece, thermo-symmetrical EN-GJS-600 cast iron machine bed featuring comprehensive cooling for high rigidity and accuracy. Working volume is 3,400 x 2,800 x 1,250 mm, expandable to 6,000 mm in the X-axis and 1,500 mm in Z.

Linear drives in the X and Y axes with up to 0.5 g acceleration and optionally 90 m/min rapid traverse, plus a ram with integrated, direct drive C-axis and a B-axis milling head with direct drive and 50-degree swivel combine to provide a highly productive, fully interpolative 5-axis machining platform for producing large, complex components.

Markus Piber, managing director of the Deckel Maho factory in Pfronten, Southern Germany comments: "The maintenance-free linear drives provide long-term precision and high dynamics for elevated levels of productivity and excellent control over quality. Coupled with their rigidity, the machines achieve surface finishes down to Ra 0.3 µm."

The standard machine version with 4,400 x 2,700 mm table accommodates workpieces weighing up to 10 tonnes, although the maximum load can be trebled on request.

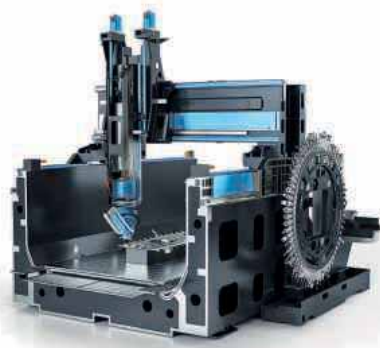
An extensive range of HSK-A63 and HSK-A100 motor spindles, manufactured in-house, is available rated up to 30,000 rpm or 79 kW or 430 Nm. The SK40-SpeedMASTER with 15,000 rpm and 130 Nm is standard. There is space for 30 tools in the chain magazine although an optional wheel magazine can accommodate 63 tools, extendable to up to 183 pockets.

DMG MORI uses its CELOS app-based control and operating interface to a Siemens or Heidenhain CNC system. It has a 21.5-inch, touch-screen display and 26 CELOS APPs to assist in scheduling work and optimising processes. The Industry 4.0-ready interface, which is compatible with ERP systems and can be linked to CAD/CAM applications, integrates machines into a manufacturer's production environment.

DMG MORI UK Ltd Tel: 0247 651 6120
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The DMU 340 Gantry machining centre



The DMU 340 Gantry incorporates optional linear drives and extensive cooling for high precision and surface quality



The New Ajax Superturn range of CNC lathes



The range extends from 400 mm swing on the AJST400 with 1000 mm between centres, 500 mm swing on the AJST500 with 750, 1250 and 2000 mm between centres and 600 mm swing on the AJST600 with 750, 1250, 2000 mm between centres.

Spindle bore sizes ranging from 52 to 86 mm.

The control has simple cycles that any turner can understand very quickly and easily to make complicated parts in minutes. The control still also has full ISO G Code programming capability for offline CAD/CAM operations that can be entered from RS232, USB or flash card systems. Making this a great all rounder in the field of Teach CNC lathes.

Other options include the control to Manual Guide I, Siemens 828D with Shopturn or Fagor 8055

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CAM system offers functions and strategies that save time and money

The KNARR Group, located in Helmbrechts, Germany, is a tool and mould maker that manufactures and supplies standard parts through to complete mould bases to customer requirements. In addition to its modern machine tools, the company uses the hyperMILL CAM system from OPEN MIND Technologies as the basis for the company's continued business success. With 20 years' experience at a renowned plastics processing company, Rainer Knarr founded his company in 1994. Devoting the business to the manufacture of tools using the knowledge of what tool and mould makers really need, he founded another company in 2000 that set itself the task of selling standard parts with its own trade catalogue.

The KNARR Group now employs 190 workers at its headquarters in the Upper Franconian town of Helmbrechts. As well as internally produced standard parts, KNARR also supplies special versions of these standard parts.

KNARR produces parts ranging from ejector technology, guides and tempering elements through to limit switches, centring units, slide elements, short stroke cylinders and collapsible cores. Since 2013, Knarr has also provided mould bases (System K and System F) and P plates of different sizes, designs and materials. In addition to the company's standard product range, complete machining is also playing an increasingly important role. "The demand for mould bases with customer-specific inclusions is rising constantly," reports Marco Mergner. As head of department, the engineering technician is responsible for the

CADCAM programming and milling technology of the department.

He highlights the importance of hyperMILL: "It not only meets our requirements but also plays a decisive role in ensuring that we keep pace and continue to develop."

As the production of mould plates, with a range of special wishes and requirements, is similar to the classic manufacturing of single parts, CAM programming has a key role to play here. "With OPEN MIND's software, we're optimally equipped for the future," adds Marco Mergner.

Rainer Knarr and his team of CADCAM specialists have placed their confidence and trust in OPEN MIND since the 1990s. Marco Mergner explains: "The considerable technical performance of the individual machining cycles with extensive options for multi-axis and 5-axis machining, deep hole drilling, automation and measurement technology is and remains a decisive factor. Another factor was the user-friendliness of the system plus the excellent service offered by OPEN MIND."

Today, the KNARR Group has a double-digit number of hyperMILL licences that are used in various departments. Since 2015, the company's CAM programmers have also been using hyperCAD-S CAD that is based on its own 3D CAD kernel that harmonises perfectly with hyperMILL. Nils Nabor, responsible area sales manager at OPEN MIND, explains: "hyperCAD-S is a CAD system specifically developed for CAM



independently from the original CAD system that was used for the design process."

Employees use hyperMILL to program all the mould plates, which can include complex inclusions and free-form surfaces. The mould plates are often machined completely from six sides in two clamping setups. Special machining operations such as the probing of stock models, deep hole drilling of cooling circuits or the measurement of components after machining can be programmed and generated with hyperMILL just as easily as a simple drilling or milling cycle.

As the components often display certain similarities, Marco Mergner and his team make use of the automation options provided by hyperMILL: "The feature and macro technology allow us to automate many of the programming tasks that repeat. This helps to speed up the tasks considerably."

Machining time savings of 90 percent with MAXX Machining

The hyperMILL MAXX Machining performance package also offers a range of innovative technologies. The power strategies provide a very high level of efficiency in roughing, finishing and drilling. The way in which OPEN MIND improves and develops its products is exemplary. Roughing takes place in spiral and trochoidal tool movements. The large axial in-feed depth of the tool over the entire cutting length results in a material removal rate 75 percent faster than using conventional strategies. This also makes the life of the tools considerably longer.

programmers that vastly accelerates NC programming processes. The system helps you to master many of the challenges that arise when working with meshes, faces and solids to create precise components and tools. hyperCAD-S allows you to prepare large volumes of imported data for subsequent NC programming completely



The 5-axis tangent plane machining and 5-axis tangent machining strategies help reduce machining times even further. These finishing operations make it possible to machine steep, planar and all continuous curve surfaces with conical barrel cutters. Small corner radii can also be milled with the same tool in one job. The 5-axis helical drilling function is also being used frequently at KNARR and is providing a great benefit. This function makes it possible to use milling tools tilted in cutting mode to generate various hole diameters, even in materials that are difficult to machine and without the need for any pre-drilling. This means that fewer tools are needed in the magazine, saving time.



The machining specialist has demonstrated the significant benefits offered by the tangent machining strategies with conical barrel cutters at a number of events including the 'Third Knarr Precision Day', which took place this year. For this purpose, a 96 mm-thick mould plate was constructed featuring a rectangular, conical breakthrough with a 1mm corner radius. Marco Mergner and his team used all three modules from the hyperMILL MAXX Machining performance package for the complete machining on a 5-axis DMC 80 U duoBlock machining centre from DMG MORI in order to generate the appropriate NC program.

Using 5-axis helical drilling, a milling head first generates the recess. After roughing, the inner surfaces and curved outer surfaces are finished using a conical barrel cutter. "With a conical barrel cutter and 5-axis tangent plane machining, we can select a line spacing of 1 to 2 mm and achieve very good surface qualities even with a narrow corner radius. With a 2 mm ball mill, we had to choose a spacing of 0.01 mm or smaller to get a half-decent surface," explains Marco Mergner. "In an ideal situation, line-by-line milling with a ball mill would have taken 12 hours. Using the CAM strategy and conical barrel cutter, we are finished in just an hour and can still achieve the very best surface qualities, even in the corners."

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Innovative new mould design tool launched in VISI 2018 R1

The latest release of VISI, from Vero Software, provides a wide variety of new and enhanced items of functionality for both CAD and CAM, specifically for the mould and die market.

VISI 2018 R1 introduces a new mould tool module based on VISI's Assembly-Ng technology. This redeveloped module provides greater flexibility when constructing supplier and non-standard tool configurations. Customisable templates, including the management of blank and predrilled plates, allow for easy tool layout creation and enhanced editing at any stage of the design process.

VISI product manager Marco Cafasso, says: "The new mould tool provides a greater level of flexibility for both tool creation and advanced editing. This allows for adjustments to be made at any stage of a tool designs development. All assembly components are automatically updated when plate adjustments are made including component cavity manufacturing data."

The ability to create project design and manufacturing technical reports have been included within the systems snapshot manager using data captured throughout the CAD and CAM project stages.

Further enhancements have been made within the plastic Flow warpage prediction module to improve result accuracy for complex technical polymers. These improvements have been achieved by a complete revision of the algorithms for the holding phase. Pressure and flow rate calculation adjustments combined with the new shape solver, significantly improve the performance by reducing the calculation time up to 40 percent.

Sheet metal developments in the progress strip development area and blank prediction include the ability to manage constraints of specific faces of a blanked component. It is also possible to define the face constraint in X or Y, or in both directions, which is particularly useful for designers who want to blank only specific areas of a model for step by step stage unfolding. In addition, the process of managing strip layouts using double component geometry has been enhanced to reduce the development time of a 3D strip design.

CAM developments include faster geometry preparation, and an enhanced 2.5-axis chamfering strategy which provides many quality updates including intelligent approach and retract points, advanced obstacle management, and significant speed improvements.

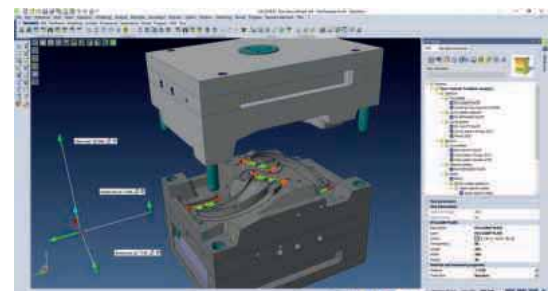
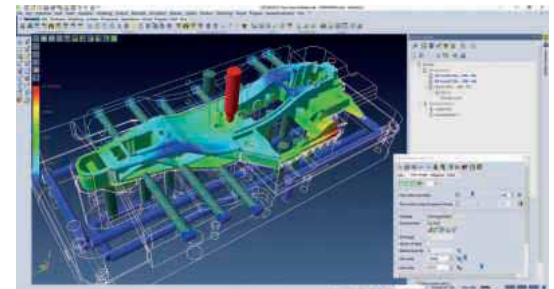
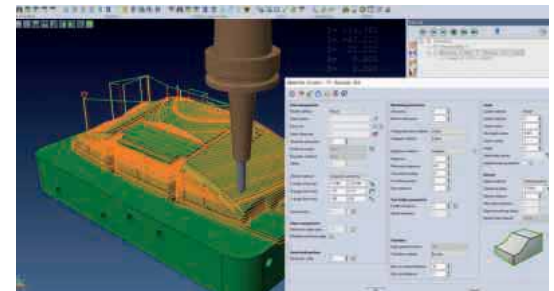
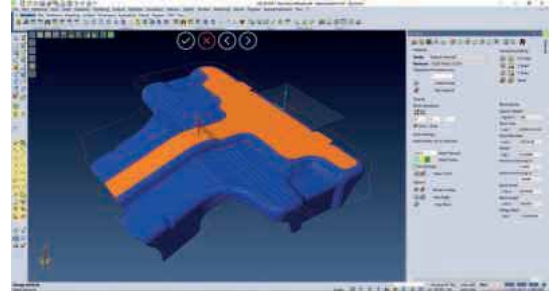
For 3D waterline milling, new adaptive stepdown capabilities can now manage variable Z steps for each independent area within the same piece being machined.

User interface improvements to the CAM navigator will see the build process status on the operation itself allowing the process manager to be switched off if required. Tool sheet reports have been updated where the user can benefit from the enhancements to the snapshot manager. In addition, for anyone requiring hole information generated from the feature recognition, there is also the added benefit of exporting the data to csv files for external use.

Finally, sharing process knowledge is key to tracking the digital thread throughout the entire manufacturing process. A new VISI-to-PC-DMIS interface enables PC-DMIS to read the native VISI CAD file directly with annotation and points previously defined in VISI loaded automatically into PC-DMIS to be used for quality control purposes.

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

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www.visicadcam.com

Micron accuracy and repeatability

The Mitsui Seiki PJ812 precision profiling centre is designed to provide ultra-precision boring and contour machining through the company's MAMS (Mitsui Accurate Milling Support) thermal monitoring system. It provides accuracy and repeatability within +/-1 µm and an accuracy of programmable feed rate consistency that is within 0.0001 mm.

The Mitsui Seiki product range is supplied and serviced in the UK by 2D CNC Machinery. The 3-axis CNC 'Mother Machine' designated vertical jig mill type has been developed for processing highly demanding workpieces typical of optical, medical, aerospace and specialist mould and die sectors.

Capacity in X-axis is 1,200 mm, Y 800 mm and Z 500 mm with a table working area of 1,200 mm by 800 mm. The mechanical design focus was on the planer-style symmetric construction to maximise rigidity to achieve super high-grade tolerance levels based on hardened and ground tool steel slideways. The machine also incorporates Mitsui Seiki's latest 'sliding mechanism'

development. Here contact slideway elements, not only to enhance levels of acceleration, but also to minimise stick-slip, enhances claims that the Z-axis has some six-times greater static rigidity than more conventional Z-axis machine tool designs.

A thermal compensation system reduces any influence of temperature change or temperature-generated displacement by 60 percent on workpiece accuracy due to integrated sensors housed on the machine faceplate and within the spindle. Further gains are made with the MAMS multi-sensor system on the Z-axis, which reduces thermal growth and deflection by 30 percent. In addition, to help maintain stable rates of axis feed within 0.0001 mm that contributes to the holding of high orders of surface finish, a centralised cooling system is incorporated within the sideways lubrication as well as the core of each ballscrew to stabilise the precise operation of axis feeds.

The Mitsui Seiki PJ812 has direct drive spindle options of 50 taper, 30 kW, 10,000 revs/min up to an 18 kW and 30,000 revs/min with 40 taper. Rapid



traverse rate is 24 m/min. Control is by FANUC 31iM-B and a 40-tool magazine is standard.

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Safe clamping of heavy dies

At MACH, Roemheld introduced a new range of wedge clamping elements with patented safety bolts designed to attach a die set to the table and ram of a power press securely, regardless of whether the tool edges are straight or angled. A positive locking action allows even a heavy upper die to remain in place during maintenance or if the clamping pressure drops.

The clamps move automatically, making them easy to operate. A position control feature verifies closure and release and reports if no die has been placed or if the edge is incorrectly set.

The system consists of a hydraulic cylinder block and a bolt guided within a housing, the bolt having a contact surface angled at 20 degrees. A projection on the bolt and a corresponding recess along the die edge ensure positive locking if the hydraulic pressure holding the upper die should fail.

Adapter plates for simple attachment to existing dies make retrofitting trouble-free. The wedge clamping elements, with single or dual action, exert a force from 25 to 1,250 kN. They are available to suit straight

and angled die edges and are designed in a variety of styles, allowing customers to configure clamping arrangements using a range of options. Modular construction allows cost-effective production of the elements, high availability and short delivery times.

Permanent lubrication gives the clamps virtually maintenance-free operation. Due to their robust design, they are able to withstand high temperatures and soiling and offer long service life. On request, multi-layer coatings can be applied to the bolts and housings to reduce wear in challenging applications.

Roemheld (UK) Ltd was founded in 1975 to supply innovative workholding solutions to the UK and Ireland. From its base in Hertfordshire, it is proud to provide workholding and materials handling solutions to a wide range of companies from



large OEMs down to the smallest of machine shops.

It provides sales, service and ongoing technical support to customers across varied industry sectors and is involved in training programmes designed to support the next generation of engineers.

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High-precision dies and tools produced using wire cut EDM

Traditional British toolmaker Wilks uses FANUC wire EDM to increase productivity on tools and dies

The task: to improve tool and die making processes by adding machining options above and beyond turret milling, the route Wilks had traditionally taken.

The solution: to automate some work processes using ROBOCUT OiE, FANUC's CNC wire cut EDM.

The result: the tool and die making machine produces more accurate dies to within microns and has accelerated manufacturing processes resulting in an over 50 percent reduction in production time and increased overall productivity.



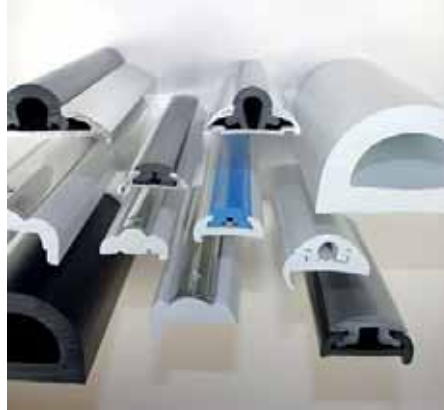
Cutting time is drastically reduced

High quality moulding made using EDM dies

Wilks is a 25 strong, family run, manufacturing company specialising in the supply of PVC profiles. With a senior tool maker due for retirement later this year, it seemed the ideal time to investigate ways in which it might improve its tool and die making process compared to the company's traditional use of turret milling machines.

Tool room manager Steve Waldie explains: "FANUC had come highly recommended to us and following a meeting with Andy Spence to discuss our requirements, we immediately felt that we had found a long-term partner for our tool room rather than simply making a one-off tool and die making machine purchase. Being a small company, we needed to be certain that any machinery investment

would yield a return relatively quickly and would not create a bottleneck in tooling schedules whilst new skills were developed.



High-precision dies and tools

"Our minimal CNC and CAD experience was of initial concern to us, but with FANUC's reassurance, demonstrations and ultimately a training course at their UK Headquarters we felt enthused and confident in both our own ability to deliver as well as having purchased the right machine to work with.

Immediately following our training the ROBOCUT tool and die making machine was put to work. A die that would have previously taken 40 hours to produce was programmed and set in two hours and cut within a further 16 hours, a time saving of over 50 percent. Even more impressive was that the tooling ran first time when trialled on our extrusion line and without need of tuning.

The saved man hours can be spent on other areas such as R&D, product trials, tuning of tooling or the design of new dies. We are now working more efficiently and with experience can only see things improve further still.

More productive tool and die machining after 5-days training

"The dies we make are now accurate within microns and the speed of manufacture has been cut by approximately 50 percent. Now we have our FANUC ROBOCUT tool and die making machine there is no looking back,

says Steve Waldie. "Seemingly overnight we have gone from using relatively basic methods to produce our tooling to high specification. Surprisingly the step-up has been very simple too; we only wish we had followed this path years ago. Historically our extrusion tooling had to be made using traditional tool making skills such as split dies. The main problems we faced was blending a round hole at the back of the die to sometimes complicated rectangular shapes at the front/exit face of the die. With these problems in mind, the process of making these dies was both time consuming and not necessarily accurate.

"Since receiving our FANUC ROBOCUT Alpha OiE tool and die making machine and having completed five days' training we were able to start cutting production dies the following week. The learning curve from a CAD and CNC Wire Eroder novice was a steep one but surprisingly rapid. The



The ROBOCUT tool and die making machine has brought 50 percent time savings

support that we received from FANUC was always there whenever we required it, which in itself was very reassuring and meant that delays in completing jobs were minimal. The dies we make are now accurate within microns and the speed of manufacture has been cut by approximately 50 percent. Now we have our FANUC ROBOCUT tool and die making machine there is no looking back."

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Polishing compound is more flexible

Engis UK has announced the launch of the new Hyprez® SC diamond polishing compound, created specifically for the mould and die polishing market.

The innovative SC carrier, developed by Engis' team of chemical engineers, resists vaporising at higher temperatures. This makes the new compound ideal for use on hot surfaces, such as large plastic injection moulds that require re-work in-situ, as illustrated in the image showing the yellow SC compound retaining its form and substance even at 298°C, as compared to an alternative polishing compound.

The carrier also provides exceptional lubricity without being "greasy" or spinning off the felt or wood bob.

In addition, the SC compound utilises a new, sharper diamond type and special particle size distribution to provide superior cutting action.

Together, these advances result in a more flexible product that provides faster cutting rates, better finishes and the capability of skipping polishing steps, so tasks can be completed more quickly, reducing

turnaround times and enhancing customer service and satisfaction.

Engis is a world leader in the manufacture of diamond polishing compound. In fact, the very first product manufactured by Engis at its inception in 1938 was diamond compound for high precision military applications. It now not only has 70+ years of manufacturing experience behind it but has complemented it with expertise in both diamond characterisation and carrier chemistry. ISO 9001:2008 quality certification ensures that Engis brings strict disciplines to its manufacturing processes. At the very core of the Engis Corporation is its "Systems Approach". This means that it not only offers quality products for sale but also provides complete solutions to meet customers' application challenges. For the mould and die polishing market, Engis offers diamond compounds as well as other polishing products, rotary and reciprocating hand tools, plus operator experience and techniques.



Engis SC diamond polishing compound (yellow) applied to high temperature steel

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Achieve higher quality moulds with new white paper

A new white paper from plastic injection moulding specialist OGM explains how a revolutionary hybrid toolmaking technology can solve stubborn quality and productivity challenges in the high-volume manufacture of moulded parts.

Efficient part cooling is essential to achieve low cycle times in production moulding applications, but complex part geometries can be impossible to cool using conventional straight cooling channels. As a result, moulders must slow down production, or suffer distortion and quality problems caused by differential shrinkage.

The white paper, entitled "Hybrid manufacturing approach delivers cooler tools", explains a new approach to mould manufacture that eliminates the conventional restrictions on cooling channel geometry. For the first time, that opens the way to optimal cooling in even the most complex parts, without the need to use expensive and potentially unreliable multi-part tool construction.

The new technique, called ConformL Cooling, combines additive manufacturing and CNC machining technologies in an integrated build process. It allows complete tools or inserts incorporating conformal channels to be manufactured in one hit, with no secondary processes.

Paul Wightman, managing director of OGM, says: "We have spent more than a year exploring the capabilities of this revolutionary new manufacturing process, developing new cooling channel designs and testing in production applications. We've been able to demonstrate dramatic reductions in defect rates on



extremely challenging parts, as well as cycle time reductions of as much as 20 percent."

"As the white paper explains, we are now working on a range of solutions designed to make it easier for all tool designers and injection moulders to take advantage of this step-change in toolmaking technology."

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Y-axis parting maximises potential of CNC machines

Greater productivity and tool life among major benefits

With the advent of new blade technology and new process methodology, manufacturers have much to gain from Y-axis parting on multi-task machines and turning centres. Along with significantly enhanced process security, impressive gains in both productivity and tool life are further benefits of this notable industry breakthrough.

Process security and stability are vital as parting off is typically the final turning operation. Any blade breakage here can lead to the scrapping of parts that already feature a lot of added value. Moreover, with greater process security comes the potential for increased feed rates and, subsequently, more productivity.

Another prerequisite of parting off is that blades should be slender to minimise material wastage and optimise tool reach on large work diameters. However, narrow tools suffer from poor stability and consequently from vibration and noise, leading to a compromise in precision and surface finish. Y-axis parting with new CoroCut® QD blades from Sandvik Coromant overcomes these issues by increasing blade stiffness by 600 percent or more. The result? Machining companies can not only achieve straight cuts with great surface finish but make game-changing gains in their parting-off operations.

Simple principle

Today, the Y-axis has become a standard feature on nearly all multi-task machines and optional on many new turning centres.



Adding a Y-axis to a turning centre provides 90° angularity between the three linear axes, in a way much similar to a 3-axis machining centre.

Y-axis parting is based on a quite simple principle. While conventional parting-off tools align with the X-axis of the machine tool, the Y-axis tool has simply been rotated 90° anti-clockwise to align with the Y-axis. In conventional parting-tool configurations, the relatively long and slender cutting blade and holder is fed at a 90° angle into the rotating workpiece. Here, cutting force is divided in two vectors, where the tangential vector is approximately two times larger than the feed vector. The resultant force vector is directed diagonally into the tool at an angle of roughly 30°, in other words, across its second weakest section, only the width of the blade is weaker. This is conventionally counteracted by reducing blade overhang and increasing blade height. The downside of both remedies is potentially compromised usability of the tool.

Instead, by turning the tip seat 90° and utilising the Y-axis, the newly designed CoroCut QD blade can cut its way into the workpiece essentially with its front end, which nearly aligns the resulting cutting-force vector with the longitudinal axis of the blade. The FEM analyses carried out by the Sandvik Coromant R&D team confirmed that the more favourable distribution of forces eliminates critical stresses typical to conventional blades and increases bending stiffness at a maximum cutting depth of 60 mm (2.36 in) by more

than six times. Or, conversely, susceptibility to plastic deformation and instability is as low as one-sixth in the Y-axis design compared with the deformation typical to conventional parting blades.

Y-axis parting benefits

The more than 600 percent increase in blade stiffness allows substantially higher feed rates and longer overhangs without any loss in stability, which consequently improves the productivity of the tool in equal measure. Thanks to this performance characteristic, parts can be parted off closer to the sub-spindle to save raw material and improve the stability of the operation.

Rather than the rigidity of the parting blade and toolholder, it is the insert that now represents the bottleneck for increasing the performance of parting operations. The general recommendation for parting off bars is to minimise overhang or, at a long overhang, use a light cutting geometry or reduce the feed. A common



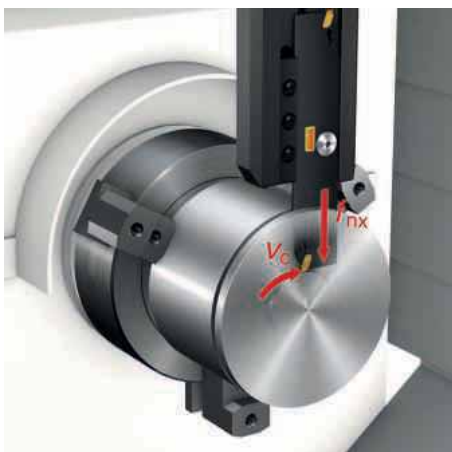


threshold value for reduced feed is an overhang exceeding 1.5 times the blade height. However, with Y-axis tooling, longer overhangs can be achieved without settling for less than optimal feed rates, cutting geometries or tool dimensions.

Many successful customer case studies have already been completed involving parts that range from magnetic valves and bolts, through to bearing rollers and pump housings. In all cases, the Y-axis parting feed could be at least doubled against the existing method, leading to productivity increases of 100-200 percent, along with tool life gains up to 70 percent. In another customer test case highlighting the potential of Y-axis blades to part off larger diameters than previously possible, the process successfully replaced band sawing for a 180 mm diameter Inconel bar, resulting in a productivity improvement of 550 percent due to dramatically shorter machining times.

Machine specifics of Y-axis parting

In short, customers can reach the full potential of their multi-task or CNC turning



machine through better utilisation of the Y-axis. Turning centres are generally used for mass production from bar stock, typically up to 65 mm (2.56 in) in diameter, and in this type of machining the biggest benefits of Y-axis parting are improved productivity and surface quality.

For multi-task machines, Y-axis parting blades primarily offer increased accessibility and capability for larger diameters. A pre-test confirmed a 50 percent increase in the overhang when cutting a conventional 120 mm diameter bar at the maximum feed capacity of the insert. A 300 percent productivity increase was achieved with no process security complications.

In a multi-task machine, typical tool assemblies, such as a Coromant Capto® C6 or HSK63T blade adaptor, are often



relatively long to enable sufficient reach between the main chuck and sub-chuck. As a result, the total setup is weak in the X direction compared with the Y-axis load, where the cutting force is directed into the tool assembly and machine spindle. Similar conditions apply to many turning centres equipped with a driven tool/milling option on the Y-axis. Typical Y-axis tool assemblies, usually based on a VDI adaptor or bolt-on blade adaptor for the machine-adapted clamping unit, are long and slender to reach between main- and sub-chuck and allow parting off close to chuck. Again, the result is a weak setup in the X direction compared with the Y-axis, where the cutting force is directed into the tool assembly and turret. Y-axis parting can help to eliminate both of these problems.

Getting started

An investment in Y-axis parting is first and foremost a change in the approach to parting operations and the related ways of working. The process offers a way to more fully utilise the capabilities of machines already fitted with a Y-axis. Alternatively, it is an option that can substantially increase the productivity of parting operations in a new machine or a modified process setup.

Remember, nearly any multi-task machine or turning centre equipped with a Y-axis and bar feeder has the potential for Y-axis parting, which can even offer the chance to reduce tool inventory as there is less need for dedicated blades. Further advantages of Y-axis parting include a requirement for only minimal changes to typical production setups; use of the same program for all

components and the potential to make genuine time savings when the workpiece is clamped at both ends as no other operations are possible during parting-off.

Ultimately, with Y-axis parting there exists the opportunity to make a significant ROI thanks to very low initial investment through initial programming and normal tool costs. ROI will also be aided by significant productivity improvements with higher cutting data.

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Tapping expert is universal, reliable and economical

The new GARANT MasterTap high-performance drill from the Hoffmann Group provides thread machining for a wide range of materials

The Hoffmann Group has been garnering attention with its GARANT Master tool family since the summer of 2015. A universal high-performance tap has now been added to the product family for high-performance cutting. The new GARANT MasterTap is the result of a fundamentally new development concept for the design of universal taps. The tool achieves outstanding process reliability with high-efficiency in a much wider range of materials, including steel, stainless steel, aluminium, brass and cast iron, than previous universal taps. The new GARANT MasterTap is available now and was on display at last month's MACH exhibition.

The key to the unique versatility of the GARANT MasterTap is its ability to remove chips perfectly. This special feature is due to a new cutting-edge geometry as well as optimised flutes, which facilitate reliable removal of the chips. Winding chips and loose swarf are consistently avoided.

When reversing in blind hole machining, the GARANT MasterTap ensures an extremely reliable process as the chips are sheared off in a targeted manner via the specially designed tooth back and the chip roots are smoothed for various materials such as steel, stainless steel, aluminium, brass and cast iron. The strengths of the tool shine, in particular when machining high-strength steel materials thanks to its deliberately rounded cutting edges. The rounding also ensures a defined and continuous wear behaviour without breakouts and thus for a longer service life.

To achieve particularly high performance and longevity, the Hoffmann Group chose a high-quality HSS-E-PM cutting material and an ALTiX high-performance coating for the production of the new GARANT MasterTap. The special ultra-smooth ALTiX coating protects against premature wear and allows high cutting speeds, even in Al-wrought alloys, because the low friction values prevent material sticking and thread corrosion. Thanks to its special guide thread, the tool achieves precise results without axial slicing even in ductile copper alloys.

The new GARANT MasterTap is the latest tool in the GARANT Master product family of high-performance tools. The product



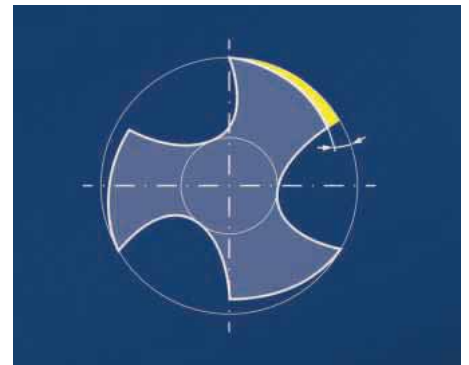
The GARANT MasterTap is the latest member of the "GARANT Master" product family



family already includes two solid carbide drills, GARANT MasterSteel SPEED and FEED, a classic four-bladed milling cutter, the GARANT MasterSteel SlotMachine, GARANT MasterSteel PickPocket solid carbide mills and the GARANT MasterSteel finishing cutters. With these products the Hoffmann Group offers state-of-the-art high-performance tools for every application.

As a leading system partner for quality tools, the Hoffmann Group combines commercial expertise with both manufacturing and service competence. To more than 135,000 customers this combination guarantees reliability in supply, quality and productivity, in the tooling sector and also in the workstations and storage sector. Optimum and reliable advice, from individual needs analysis through to efficient use of products, is assured at all times.

Alongside tools for machining, clamping, measuring, grinding and cutting, the portfolio also comprises hand tools,



The optimised tooth back guarantees a reliable process in a wide range of materials. It shears off chips optimally and smooths the chip root

protective work wear, workstations and storage and workshop accessories. Customers include major listed companies as well as medium-sized and small companies in more than 50 countries. Including GARANT, its own premium brand, the Hoffmann Group offers 75,000 quality tools from the world's leading manufacturers.

With comprehensive customer service and delivery quality of over 99 percent as certified by the TÜV, the tools specialist, headquartered in Munich, is a reliable and efficient partner for its customers.

Hoffmann GmbH
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www.hoffmann-group.com

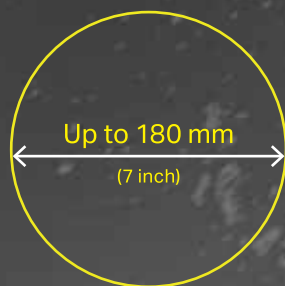
A new dimension to parting off

CoroCut® QD for Y-axis parting is designed with the insert pocket rotated 90 degrees, thereby shifting the resultant load to the strongest section of the blade. This provides more than six times higher blade stiffness, allowing you to increase your feed and use longer overhangs without losing stability.

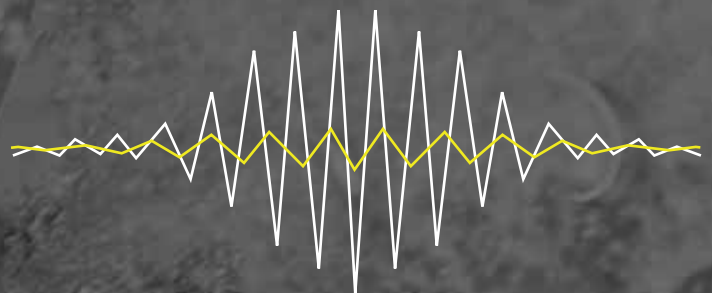
A small, simple change, but with significant results.



Increase your feed rate – get more done in a day



Part larger than ever before



Less vibration – less noise

View Y-axis parting in action:
www.sandvik.coromant.com/corocutqd

SANDVIK
Coromant

WNT's continued growth driven by tooling developments

Visitors to the WNT stand (part of the Ceratizit Group) at MACH 2018 were able to catch up on all the latest cutting tool, toolholding and workholding innovations that have been introduced by the company since the last MACH exhibition. A selection of these 'New to MACH' products are highlighted below and are just a snapshot of the more than 55,000 articles available as standard from WNT:

S-Cut UNI

WNT's S-Cut UNI milling cutters feature a combination of an S-curve cutting edge and extremely irregular pitch that make it a highly innovative and high-performance solid carbide cutting tool. The geometry, which creates a variable helix angle, creates an extremely smooth cutting action, which in turn has a highly positive impact on tool life and surface quality of the workpiece as fewer vibrations are produced during milling. A further advantage of this cutting action is that cutting data can also be increased, to reduce cycle times.

Further assisting the elimination of vibration is the S-Cut UNI's extremely irregular pitch of the cutting edges, which counteracts the induced vibrations from tool to workpiece to machine tool system caused by entry and exit frequencies when making the cut. This results in an extremely stable machining process with hardly any visible chatter marks.

The WNT S-Cut UNI series of cutters is suitable for universal applications taking in materials such as steel and stainless materials and where service life and high-quality machining are of high importance.



WNT S-Cut UNI

Monstermill PCR UNI

WNT's Monstermill PCR UNI solid carbide milling cutters enable precise,

process-secure, ramping/plunge milling at high angles or, with extreme chip volumes during full slot milling. This is achieved thanks to a new four-flute, tip centring geometry, which delivers powerful and extremely quiet milling across a range of materials including steel, stainless steels and cast iron.

MonsterMill PCR UNI cutters excel at roughing and finishing, as well as providing exceptional performance when vertical plunging. This is achieved thanks to the patented 142° centring tip in the centre of the end cutting edge, making rapid centring



Monstermill PCR UNI

possible without having to perform helical milling in advance. Users can now create holes on sloping surfaces without the need for separate milling and drilling operations.

With its four cutting edges, MonsterMill PCR UNI has a distinct advantage in terms of cutting data over conventional plunge milling cutters with only three flutes. Feed rates can be up to a third higher, with feed/tooth rates of up to 0.137 mm/rev achievable for ramping/plunging, slotting and profiling operations. Despite the high cutting data process security remains high thanks to the special core geometry that has been designed to break chips and prevent spiral chips forming during plunging and drilling. This helps to reduce or eliminate chip jams and ensure reliable swarf removal via the flutes. This cutter design also creates a quieter cutting process, thanks in part to the irregular flute pitch and helix angle on the milling cutter that has the effect of

preventing the tool from oscillating and starting to vibrate, even when high ramping angles of up to 45° are being used.

MiniMill carbide grooving

The WNT range of MiniMill carbide grooving, back-chamfering and thread milling cutters have seen further development since the last MACH exhibition, with new geometries delivering improved performance, surface quality and process security when milling grooves and slots. These changes include 'twisted teeth' that create a much softer cut as the cutter enters the material. In addition, this cross-pitch on the cutting edges helps in reducing vibration, even where large overhangs are required to access the component being machined, or the part has thin walls or may be unstable. The cross-pitch design also aids swarf removal, which in turn improves surface quality of the machined part, eliminating the need for finishing cuts in many applications. By efficiently removing swarf from the work area, the new geometry also enhances tool life and process security.



MiniMill carbide grooving

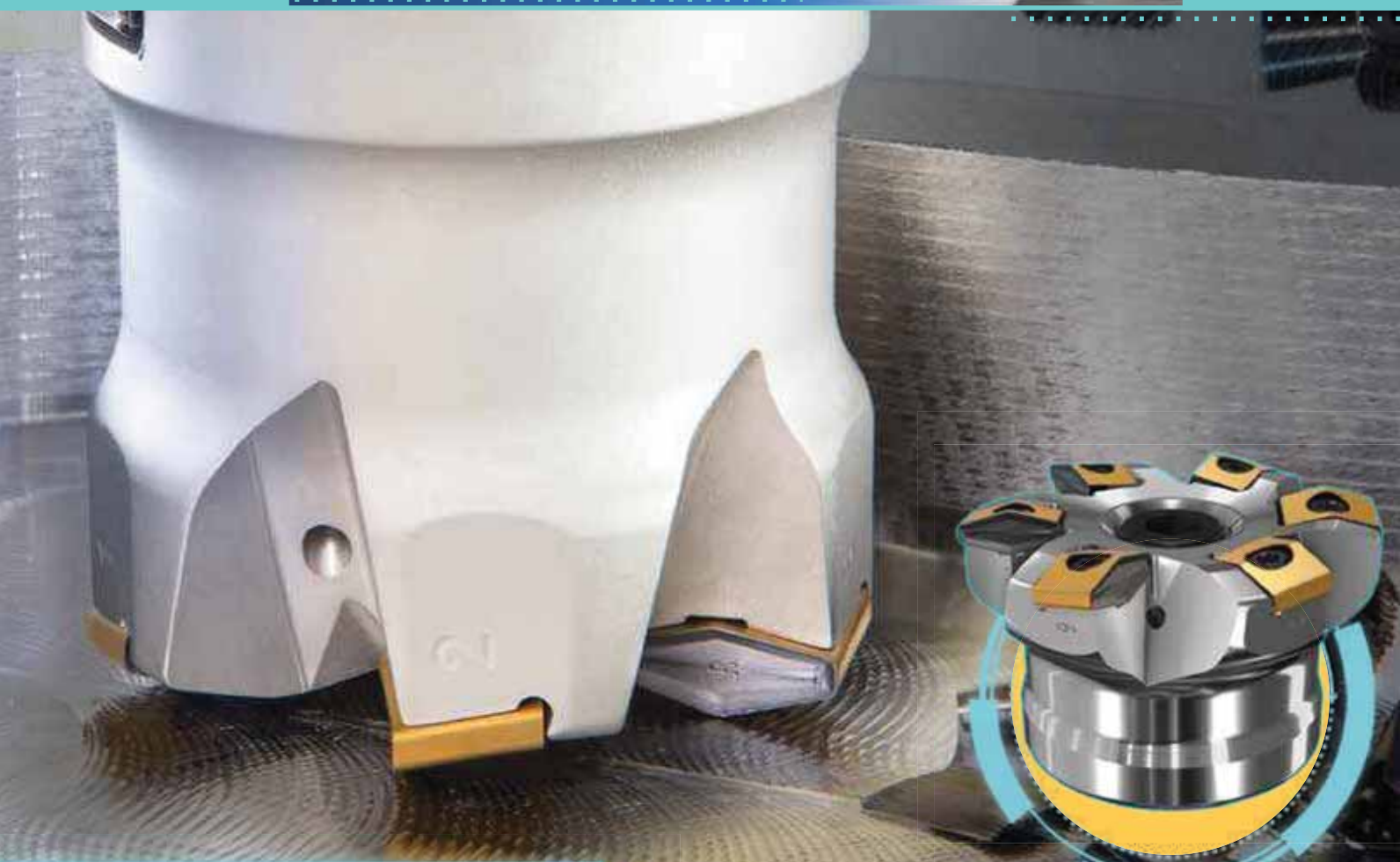
CERATIZIT WNT Ltd

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Email: tony.pennington@wnt.com

www.wnt.com

Tangential High Feed Speed Master



TANG4FEED
HI-FEED MILLING

Unique Tangential Insert
for **High Feed Face** Milling



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Insert



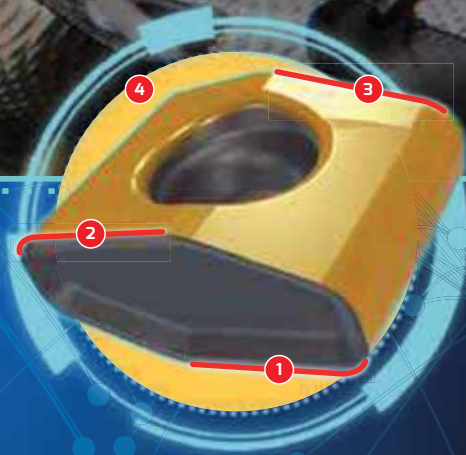
For Steel, Cast Iron
and Exotic Materials



Strong
Cutting Edge



Up to 3.2°
Ramp Down Angle



Tool lifecycle management around the world

With a strong trade show presence in 2018, TDM Systems presents sophisticated Industrie 4.0 solutions

With "TDM next generation" last year, TDM Systems presented a completely modernised software solution which is being continually developed further. The software company is presenting new modules for TDM 2017 Global Line and TDM Cloud Line, the first global cloud solution for Tool Data Management, at several international trade shows in 2018.

All trade show appearances by TDM Systems will reflect Industrie 4.0. With TDM next generation and TDM Cloud Line, the tool data specialist from Tübingen is offering new solutions with high added value for digitalisation. TDM next generation combines the two tried-and-tested solutions TDM 2017 and TDM 2017 Global Line in one. Both are based on the same design, thus providing the right solution for every requirement, both for newcomers to digitalisation and for complex, international groups.

Transparency on the shopfloor

TDM Systems will demonstrate new modules for TDM Global Line at the trade shows TDM Shopfloor Manager and TDM Machine Process Control (MPC). These modules significantly increase transparency at the manufacturing level. As a result, every user can create their own personal working environment using apps that are adapted specifically to them and their day-to-day tasks. Furthermore, workstations can now



TDM next generation is the Industrie 4.0 solution for tool data management in the metalcutting industry

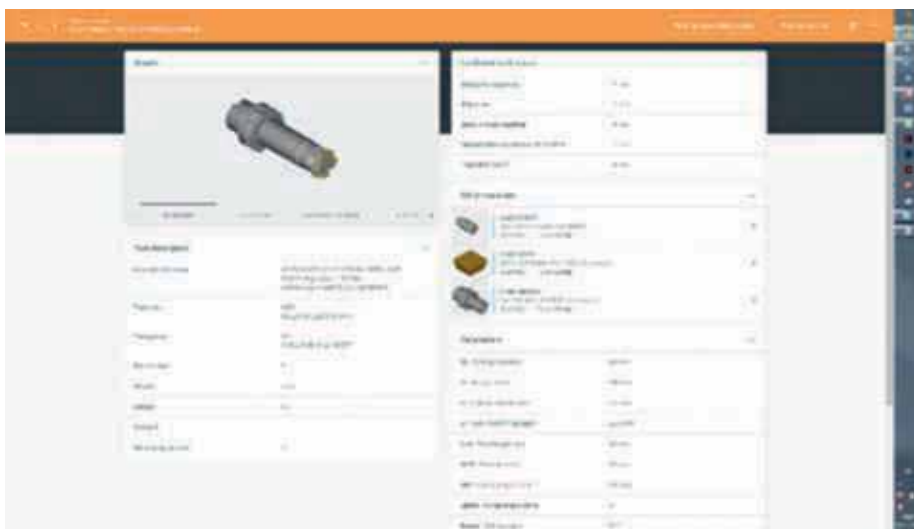
be managed via cost centres so that an overview of costs is maintained at all times.

The first global cloud solution for Tool Data Management, TDM Cloud Line, is also based on TDM 2017 Global Line. The advantages of Cloud solutions are obvious: all data can be received anywhere, at any time, in the best possible quality. This ensures that it is available immediately for the virtual machining process. The user then only needs a computer with Internet access to start the digitalisation of their tool data straightaway.

Eugen Bollinger, vice president sales at TDM Systems, also promises: "Transitioning

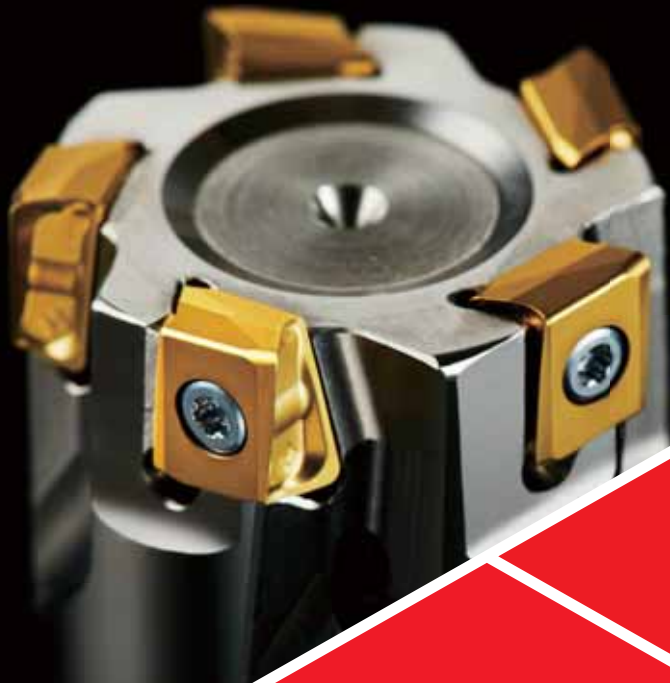
to TDM or TDM Global Line is easily possible at any time since the underlying technology is identical. All versions are being developed further in parallel."

TDM Systems GmbH Tübingen, has been a leading provider of Tool Data Management in the metalcutting industry for more than 25 years. With the Tool Lifecycle Management strategy, TDM Systems is focusing specifically on process optimisation through optimal tool planning and provisioning. Creating and editing tool data and graphics, integrating tool know-how and 3D graphics into the CAM engineering and organising the complete tool circulation at the shopfloor level are the three core competencies of TDM Systems and the pillars of the TLM strategy. As a centre of expertise within the Sandvik Group, TDM Systems draws on the know-how of various tool manufacturers when developing its software products.



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Drilling yourself a hole

Depending on the task at hand, there is a kitchen knife designed specifically for the food item you are handling. Whether you are slicing an apple or a loaf of bread, using the most suitable blade makes the process safer and easier. Similarly, drill bits come in various sizes and shapes to create different kinds of holes in many different materials. Here, we explore the distinctive characteristics that make up a drill bit and how these features impact the actual drilling of an application. There are typically four characteristics that dictate the type of hole created, which is referred to as drill bit geometry.

Rate of twist

The spiral is the rate of twist in the drill bit. This is designed so that the front edges cut into the material, while the spirals along the length of the bit remove the debris from the hole.

Responsible for controlling the rate at which the chip is removed, a fast spiral or high twist rate is required for the removal of a large volume of chips and is often used in high feed rate applications under low spindle speeds. A fast spiral is generally used on tougher materials that have a tendency to work harden, like stainless steel.

Low twist rate bits, or low spirals, are used in applications where high cutting speeds are traditionally used and where the material is known to clog the hole in the process. This is a common problem when cutting softer materials like aluminium and copper.

Choice of angles

When it comes to handheld drill bits, speed and precision are important. The performance of the drill is largely impacted by the angle selection of the drill bit, which differs depending on the material of the application.

The point angle of a drill bit is traditionally

between 118 and 135 degrees. A 118-degree point angle, also known as a chisel point, does not have any self-centring capability. This means that unless the centre of the hole is manually marked with a centre point, the drill will take longer to penetrate the surface. This can cause work hardening, which increases the surface hardening and may drift as a result, producing an inaccurate hole.

A drill bit that has a 135-degree split point can penetrate the surface of an application quicker in comparison to a 118-degree angle drill bit. This is because it has a flatter angle that comes to a definitive point at the tip. This feature enables the drill bit to centre itself without the need for markings, making it ideal for handheld drill machines.

Flute length

The spiral section of the drill bit is referred to as the flute length and it is this that determines the maximum depth of drilling. It also controls the accuracy and stability of the bit and directly affects the outcome of the hole created.

For example, while deeper holes require a drill bit with a longer flute, they are more prone to wear as their flexibility produces more friction. In comparison, a shorter flute creates less friction and has a greater life span, but the user is restricted by the depth of hole.

Drill bit material

Traditionally, drill bits were made from high speed steel (HSS), which has since been replaced by carbon steel. The temperature resistance of a drill bit previously depended on the HSS's composition. Generally, the higher the cobalt content in the material, the greater the temperature resistance.



M42, which is classified as high-speed steel with cobalt (HSS-Co), has been identified as offering optimum heat resistance but the increased cobalt in the material also increases brittleness.

To overcome this, Cryobits have been designed to include many of the best design geometry features, such as the 135-degree split point, and combined them with a modified grade of HSS-Co. This offers optimum heat resistance with a reduced chance of fracturing the drill bit. The Cryobits are then enhanced by the NCH cryophase process. This cryogenically cools the steel to -170 degrees Celsius, so that it converts the soft Austenite into hard Martensite.

This process causes the steel to form carbide particles, which fill microscopic gaps in the metal structure to increase the wear resistance. This makes it tougher than standard maintenance drill bits and lasts twice as long.

Just as you wouldn't cut the meat for your Sunday roast with a bread knife, engineers should also be making sure they understand the requirements for their drill bit to achieve the desired outcome.

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Walter extends Paradur deep-tapping range for ISO P and ISO K Materials

Tooling expert Walter GB has announced that its Paradur HT tap range has been extended to include a new HSS-E series for dimensions UNC 1/4 UNC 1 for deep threads up to 3.5 times diameter. This is in addition to the existing M4-M36 and M10 x 1- M33 x 2 series.

The new taps offer unrivalled cost-effectiveness and performance, with significantly reduced machinery downtime due to excellent tool life, process security and effective chip control.

Featuring straight flutes, axial through-coolant and a TiN coating, the taps' specially-designed cutting-edge geometry generates excellent chip breaking, even in long-chipping materials since the through-coolant flushes the short chips out of the blind hole. This elimination of 'bird nesting' effectively translates into high process reliability.

Ideal for machining ISO P materials with a tensile strength of 700-1400 N/mm² (200-410 HB) and for ISO K materials, especially for GJS (GGG), the new tools are ideal for users in the energy sector as well as general mechanical engineering.

Walter AG is one of the world's leading metalworking companies. As a provider of specialised machining solutions, the company offers a wide range of precision tools for milling, turning, drilling and threading applications. Walter works together with its customers to develop custom solutions for fully machining components for use in the aviation and aerospace industries, as well as automotive, energy, and general engineering.

The company demonstrates its engineering Kompetenz at every stage of the machining process. As an innovative partner capable of



Walter's Paradur HT tap is now available for UNC dimensions

creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With over 3,500 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries. As a company with global operations, the Walter Group is represented in all the major markets of the world. This enables it to implement machining solutions in the form of both standard and special tools quickly and locally at the customer's site.

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Seeing is believing - new Phantom end mills

Quickgrind has launched its innovative Phantom series of solid-carbide end mills for enhancing a whole host of prismatic machining operations. These four-flute cutters have been designed to offer machine shops the opportunity to implement high-feed metal-cutting strategies that will boost metal removal rates and shorten cycle times. If required, a through-coolant version is also available, called Phantom Ice, to suit greater depth-of-cut requirements.

Stand-out features of Phantom end mills, which have the added advantage of being suitable for remanufacture, include a tough carbide substrate for strong, stable and efficient machining. The substrate, with its ability to withstand extreme cutting forces, is matched with an advanced coating and unique edge geometry to promote optimised chip flow and help maximise wear resistance.

Typical applications include rough-machining operations such as slotting, pocket milling and contour machining, as well as plunging and helical



ramping. Machine shops will also enjoy gains when deploying Phantom end mills to perform pocketing with high length-over-diameter ratios. Thanks to their neck-relieved shanks, Phantom cutters are ideal for extended-reach applications in deep cavities, providing an excellent alternative to using standard small diameter, long and extra-long series mills that are prone to vibration, chatter and breakage.

Phantom high-feed performance end mills are perfect for use on workpiece materials that include stainless steel (including Duplex and Super Duplex), Inconel, titanium, tool steel, cast iron and hardened steels. In fact, Quickgrind says that machine shops are welcome to put the tools to the test when it comes to material. The company's applications team loves a challenge and is more than happy to discuss specific applications.

The Quickgrind Phantom and Phantom Ice are available as 10, 12, 14, 16, 20 & 25 mm diameter end mills. There are various overall lengths with bespoke versions delivered quickly to suit the client's individual applications. For example, 12 mm diameter Phantom end mills are capable of cutting at speeds up to 200 m/min (0.7 mm depth of cut) and feed per tooth up to 0.6 when machining materials with hardness values up to HRC30, such as carbon steels and cast iron. Even materials up to HRC50, like tool steels and titanium, can be processed at cutting speeds up to 180 m/min and 0.4 feed per tooth.

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Thame provides QuickPoint precision for Michell Bearings

As the inventor of the hydrodynamic bearing more than 100 years ago, Michell Bearings has spent the last century constantly developing its product range to meet the ever-changing needs of the company's global customer base. The use of state-of-the-art-production technology, decades of in-depth experience and the application of stringent quality systems has resulted in the famous North East company gaining a reputation as a world leader in the field of bearing design and manufacture for both the industrial and the marine sectors.

As the efficiency, reliability and longevity of any bearing depends largely on the quality of the methods used its manufacture, Michell Bearings employs a wide range of state-of-the-art CNC machine tools and advanced production aids at its impressive South Shields, Tyne and Wear-based headquarters.

The recent installation of a Hermle C60 UMT, 5-axis CNC machining centre prompted manufacturing engineering manager Chris Kemp to contact Tony Lewis of Thame Workholding with the intention of exploring efficient workholding ideas that

would enable the company's new acquisition to maximise its productive potential: "As a leading designer and manufacturer of self-contained white metal bearings and also PTFE faced hydrodynamic bearings, our products can be found in a wide range of challenging applications throughout the world. In addition to countless industrial applications, Michell Bearings provide superior performance at sea. We have a long history of producing bearings that withstand the test of time and we have products installed with 35 of the world navies on more than 300 vessels.

"Our bearings have an excellent reputation for their reliability when used across a wide range of demanding uses, often within harsh environments. Meticulous production and inspection methods ensure the quality of our bearings and help safeguard the continued global standing of Michell Bearings.

"In accordance with our ongoing quests to enhance our capabilities and to further increase our production efficiencies, we recently purchased a Hermle C60 UMT 5 axis CNC machining centre with an XYZ capacity of 1,200 mm, 1,300 mm and 900 mm. Our advanced new machine tool allows the highly dynamic processing of workpieces up to 2,000 kg in weight.

"With the aim of maximising the production potential of our new investment, achieving the highest possible yield and helping to guarantee that the machine consistently meets our demanding standards of precision, I recently contacted Tony Lewis of Thame Workholding.

"After studying our new machine's specification and capabilities and considering our objectives, we concluded that a workholding arrangement, incorporating Thame Workholding's Lang QuickPoint system and Samchully jaw boxes, would be ideal for our needs. By working together, Tony and I developed the system incorporating Thame Workholding's products that has considerably reduced the machine's setup and job changeover times and that has greatly increased its available production time. In addition to boosting efficiency, our new workholding system's ability to securely hold our workpieces helps



us to guarantee that we consistently achieve the required levels of accuracy and surface finish."

The ingenious workholding arrangement conceived by Tony Lewis and Chis Kemp consists of several circular 'slave' plates that can be setup off-line. The 'slave' plates have Lang QuickPoint studs attached to their bases and a series of QuickPoint plates that remain loaded on the machine table. The slave plates also feature T-slots that allow Samchully jaw boxes to be moved into position, tightened onto the workpiece and then centralised ready for loading onto the machine.

On completion of a machining routine, the 'slave'-plate holding the finished part can be removed by crane and the next 'slave'-plate, holding the new workpiece, can be lowered into position. After quickly securing the new 'slave'-plate to the machine's table, the next machining operation can be immediately commenced. It helps that the Hermle CNC machining centre's spindle can move clear of the table, ensuring that the working area is completely unrestricted and accessible, allowing



unhindered crane loading from directly above the machine table's centre-line.

With exceptional positional accuracy, the Lang QuickPoint system provides precise and repeatable mounting of fixtures and other elements on to machine tables, indexers, cubes, rotary tables and mill-turn machine tools. QuickPoint's height of only 27 mm makes it the lowest profile zero-point-system currently available. Manual clamping is achieved with just one tightening screw, alternatively, hydraulic or pneumatic clamping is also possible. The use of this simple and sturdy system allows a maximum pull-down force 6,000 kg.

Tony Lewis concludes: "Our quick Point location system is a rapid and accurate clamping arrangement that boasts an extremely low profile of just 27 mm. The system is based on four wedge bolts in the pallet that engage with four grooved locating bolts screwed to the vice or fixture. Clamping and unclamping is quickly



performed by turning a central screw and repeatability is extremely accurate.

"The highly repeatable nature of QuickPoint guarantees that Michelle Bearings' 'slave'-plates, can be loaded with workpieces off-machine, then quickly and precisely attached to the Hermle machining centre's table. Now, rather than wasting valuable time setting up a workpiece when the machine is idle and performing a machining operation as consecutive activities, these processes are capable of

being completed concurrently and within the machine's cycle time. This method can help deliver outstanding machining efficiencies."

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Safe as well as efficient

The HAIMER Safe-Lock™ pull out protection system is fast becoming the industry standard, as it ensures safe cutting tool clamping. Special drive keys in the toolholder perfectly match the spiral shaped grooves on the cutting tool shank, thus creating frictional clamping forces and a positive locking form-fit. This effectively prevents the cutting tool from pulling out of the toolholder. Furthermore, it increases the productivity through faster permissible speeds and increased tool life.

Within the last ten years, since the introduction of the Safe-Lock system, it has been confirmed continually that this method of clamping the tool is often clearly superior to conventional milling chucks and Weldon shanked toolholders. This is proven by a large number of license partners, some of which rank amongst the world's leading cutting tool and toolholder manufactures, for example Walter, Widia, Sandvik Coromant, Seco Tools, Sumitomo, Kennametal, Helical, Emuge Franken, Data Flute, Niagara, OSG and Mapal.

In 2017, Iscar and Ingersoll also decided to offer tools with the Safe-Lock shank. Furthermore, the shrink, collet and hydraulic chuck Safe-Lock toolholder portfolio has become much larger within the last few years. In addition to the Safe-Lock hydraulic chucks from Kennametal, Mapal is already working to introduce its hydraulic chuck offering with Safe-Lock to the market.

Success in the aerospace industry

Safe-Lock has emerged from the requirements of heavy-duty machining, which is a daily challenge in the aerospace and energy producing industries. Innovative materials such as various titanium alloys are not only light, but also very rigid, corrosion resistant and difficult to machine. This doesn't only affect the machine concepts and processes, but also the cutting tools and tool holders that are being used.

Many workpieces are made from a solid block; during this milling process up to 90 percent of the material is being removed. To optimise the process economically as well as qualitatively and in order to achieve a high metal removal rate, high torques and feed rates with low rpms are chosen. But during this High Performance Cutting operation (HPC), high pulling forces occur. In combination with high cutting forces and



aggressive feed rates, a flexing movement of the tool in the toolholder is created which in the end increases the risk of tool pull out. This especially affects all the toolholder designs which provide accurate clamping and a high run-out accuracy, like for example shrink, hydraulic or milling chucks.

Consequently, Safe-Lock is now widespread within the aerospace industry. Alexander Steurer, senior manager NC - Programming Stator Components at MTU Aero Engines in Munich, explains: "Through the introduction of Safe-Lock and the shrinking technology from HAIMER, we can guarantee process reliability even with milling challenging high temperature materials. This is a prerequisite to guarantee smooth processing during manufacturing of frames and castings, given our high degree of automation."

The combination of pull-out protection and highest concentricity of the Safe-Lock system leads to low vibration and as a result, a very stable machining process. Due to the increased cutting depths and feeds, the metal removal rate can be increased significantly and, thanks to the improved runout accuracy of HAIMER shrink fit chucks, tool life is improved by up to 50 percent.

The benefits of less than 3 µm runout, that the symmetrical Safe-Lock design provides, coupled with optimum balance and the possibility for easy length presetting were substantial reasons for MTU to switch to the HAIMER system instead of continuing to use Whistle Notch or Weldon tooling systems.

While these other systems do in fact prevent tool pull out, both are unsymmetrical by design, hence providing insufficient runout and balance accuracy.

Higher productivity with Safe-Lock

Safe-Lock has not only found enthusiastic followers in the aerospace industry. Working at Glätzer, Daniel Rautenbach knows how fiercely competitive and thorough the automotive industry can be. The managing director of the CNC machining specialist located in Solingen explains: "Perfect quality and delivery reliability are the basic requirements in order to quote in our industry."

Pricing is highly competitive and therefore, in his business, the difference between profit and loss comes down to process efficiency. Hence quality without compromise is a must.

Through one of the biggest projects in this area, operation manager Ingo Schulten became aware of the HAIMER Safe-Lock pull out protection system and started using it in the middle of 2013. The specific application was a part for a pneumatically-operated truck disc brake, which consisted of Type EN-GJS-800-2 spheroidal-graphite cast iron. In order to mill concave contours, the contact between cutting tool and the workpiece isn't just punctual but actually covers between 30 or 40 percent of the tool.

Ingo Schulten explains: "The extremely high engagement and cutting forces cause

the tool to want to pull out from the holder." The utilised Weldon Chucks ensured that the cutting tool stayed in the holder, but the side lock screw prevented the tool from achieving good runout accuracy. According to Ingo Schulten "the tool life was very unstable which even led to tool breakage."

The milling tests with Safe-Lock convinced him and the other employees at Glätzer: "To me the switch to Safe-Lock seemed obvious, like using an electric starter instead of a crank to start a car. The cutting data improved significantly. The tool life increased by 40 percent consistently."

Benefits of high-speed cutting

Safe-Lock is also becoming increasingly popular in other industries, during HSC machining with high-helix end mills as well as in trochoidal milling. During trochoidal milling operations, where the cutting speed and axial depth of cut can be increased through software support, the productivity is significantly improved. Milling operations are carried out three times faster with deeper depths of cut, even when it comes to hard and difficult to machine materials.

However, this also increases the danger of tool pull out. Even though only a thin chip is



usually removed during trochoidal milling operations, often the entire length of the cutting tool edge is used during the process. This results in higher axial forces which force the operator to pay attention to safe cutting tool clamping. A shrink fit chuck with Safe-Lock is the ideal solution since it offers more security than the Weldon system, is easier to install and can be clamped very precisely. The ideal balancing and runout characteristics of the shrinking technology in

combination with the clamping safety of the Safe-Lock system permits the possibility of greater productivity achieved through faster permissible speeds and increased tool life - all with complete tool security assurance.

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Vice holds cylindrical or prismatic parts for 5-axis machining

The PC80Z self-centring vice from Roemheld is available in a new, two-in-one version that accepts the manufacturer's optional round inserts, enabling cylindrical components or billets from 44 to 95 mm in diameter to be clamped securely. There is now no need for a machinist to buy a bespoke workholding solution or machine



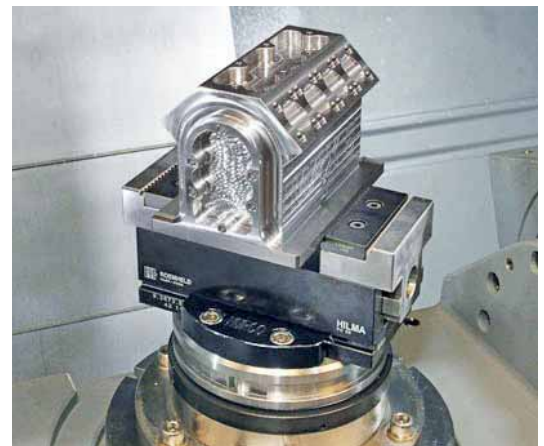
The Roemheld PC80Z self-centring vice in its new configuration with round inserts clamping a cylindrical component

sets of soft jaws to hold parts of different diameters.

The vice can be converted back within a couple of minutes to its conventional role of holding prismatic components. It simply requires the Allen bolts holding four round inserts to be unscrewed and the pair of straight, 80 mm wide jaws to be reinstated. Parts from 17 to 139 mm long can then be secured for metalcutting using the 62 mm clamping stroke.

With an overall height of 60 mm, the low-profile unit ensures that not much Z-axis travel is lost on a vertical machining centre. Additionally, despite its all-steel construction, the light weight of only 6 kg avoids taking up undue allowance from a machine's maximum pallet load, enabling heavier parts to be produced.

Well suited to use on 5-axis machining centres and in automated production cells employing pallet magazines, the vice is fitted as standard with the Lang interface for added versatility. Clamping force is 20 kN at



60 Nm closing torque. The device is easy to disassemble and clean, minimising loss of productivity during routine maintenance.

To find out more about Roemheld's range of workholding and materials handling, contact:

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Tactile and optical measurement on one machine

At the world's leading trade show for quality assurance, Control in Stuttgart, some 900 manufacturers of QA equipment presented innovations. Systems supplier Klingelberg, a leading manufacturer of precision measuring centres for the gear industry, covered a broad range of topics, including the innovative field of optical metrology, with a range of P-series models. Here, the company is entering brand new territory. Klingelberg Precision measuring centres are used throughout the world for accurate measurement of gears and high-precision, axially symmetrical components. These measuring machines ensure that reliable measurement results are obtained not just in measurement rooms and geometry laboratories, but also in the shop-floor environment. The P series stands out for its patented, high-precision 3D NANOSCAN probe system as well as an easy-to-use roughness probe system, among other features. These tactile sensors have now been upgraded with a powerful optical sensor.

High-speed measurement data logging and high point density

Klingelberg Optical Metrology is a smart combination of tactile and optical metrology. An extremely rapid changeover from the tactile system to the optical sensor makes this a hybrid system that combines the advantages of both measurement methods.

The high-precision tactile measurement is ideally complemented by high-speed optical measurement data logging with a high point density.



Of course, a purely optical measurement is also possible. At Control, Klingelberg demonstrated high-speed, complete 3D digitising of gear components, among other things. The measurement result takes the form of a high-resolution 3D point cloud, which can be evaluated in a number of ways or can undergo further processing as a CAD file.

The new precision is black

The new generation of the P series, which Klingelberg presented to an international audience of industry professionals in Stuttgart, includes the two P-series precision measuring Centres, the P 26 and the P 65. Not only has the proven technology been systematically advanced, the machine design has also been thoroughly revamped. The new design focusses on a long-life colour concept with a concentration of dark gray hues. This makes machines used directly on the shop floor less prone to showing dirt.

P 65 for precision measurement

In its measurement toolkit at Control, Klingelberg presented the new P 65 for medium diameter ranges, which makes use of this innovative measurement technology for the first time. The Klingelberg optical metrology concept was first successfully unveiled at the EMO 2017 trade show where it received a very positive response.

The new P 65 has even more to offer: For over a decade, Klingelberg precision measuring Centres have been successfully operated on shop floors around the world using the optional three-point vibration isolation system developed by Klingelberg. The integrated system familiar from the P 26 and P 40 has now also been implemented in the new P 65.

With the P 26, Klingelberg presented its tried-and-tested precision measuring centre for smaller diameter ranges in the new machine design. The machine and software

concept of the P series is optimised for measurement of complex drive components.

The technology replaces up to four conventional measuring devices: gear measurement; general coordinate measurement; form measurement and roughness measurement. Every measurement task can be fully automated in a single setup. The Klingelberg roughness measurement system, which has already been successfully used in several hundred P machines, also includes measurement of surface roughness on internal gears. What differentiates the Klingelberg system from many others is the possibility of systematic measurement using a fully automatic CNC-controlled measuring procedure.



Cost-effective process monitoring

With the P 16 G, Klingelberg has a measuring centre for axially symmetrical components in its portfolio that is designed around measurement tasks outside of gears. Thus, instead of gear cutting software, the P 16 G is equipped with software for dimension, form, and position measurement as standard.

Wherever gauges alone have previously been used for quality assurance, the P 16 G can perform the relevant measurements. The advantage: it measures any number of different components. A P 16 G can therefore replace component-specific gauges and multipoint measuring devices, which are capital-intensive and inflexible.

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Aberlink shop-floor accuracy for Martin Aerospace

Established in 1993 in Lanark, Central Scotland for the past 24 years, Martin Aerospace has developed into a respected supplier of precision manufactured products to the global aerospace and quality critical industries. Martin Aerospace manufactures a wide range of components, from relatively simple parts to the production of components with complex geometrical shapes on its advanced 5-axis machine tools.

Operations such as turning, milling and drilling are completed on machine tools with the benefit of live in-process probing that continually monitors quality. The company's machines are linked to central computerised systems which are used to manage work scheduling and machining programmes, also to permanent record actual component dimensions.

Martin Aerospace uses two CNC CMMs, located in an environmentally-controlled area to perform 100 percent final inspection on the company's output. However, in accordance with its policy of supplying production staff with the best available inspection aids, a search was recently made for an additional CMM that had the ability to deliver the required standards of inspection accuracy on the company's shop-floor. Having considered the offerings from leading CMM manufacturers, an Xtreme CNC CMM was purchased from Aberlink.

Quality manager Colin Tonnar explains: "Quality is central to all of Martin Aerospace's activities. In addition to consistently delivering parts and kits on-time and on budget, our quality ethos and recording and traceability systems are amongst our key competitive advantages. As well as enabling us to consistently achieve 100 percent score cards from the most demanding of our global customers, our strict quality regime assists us in driving down internal costs through achieving right-first-time production and by the reduction of scrap levels.

"We ensure that our production personnel have quality uppermost in their minds and we support them by delivering on-going training, by using state-of-the-art Q-Pulse quality managements systems and by providing them with the latest inspection equipment.

"Following a trouble-free installation in a central location on our shop-floor and operator training, our new Aberlink CMM is

now being used by our production staff for in-process inspection procedures. Now, rather than lose valuable production time taking machined parts to our inspection department and waiting for a CMM to complete its current task, instant accurate CMM inspection results can now be achieved close to the point of manufacture. This faster feed-back enables machine adjustments to be made when component dimensions drift from nominal conditions.

"Another typical use for our new Xtreme CMM is that our machine operators are now able to place first-off machined components on the new CMM's bed, the relevant program quickly selected and the start button pressed. Following rapid and precise, fully automated CNC measuring routines, captured inspection data is archived by our electronic system. Paper documents with all relevant information are also produced by the CMM for inclusion in our machinists' work folders.

"Having now installed a CNC CMM that is able to deliver our required levels of precision on our shop-floor, we have been able to reduce the time between the machining of components and the verification of their dimensions. In addition to allowing the quicker capture of data and increasing machine tool productive times, the use of our Aberlink Xtreme CMM has allowed our inspection department's CMMs to concentrate on their important final inspection duties."

The Xtreme has a novel non-Cartesian structure and makes use of linear motors and mechanical bearings. This advantageous arrangement guarantees that the CMM maintains its impressive accuracy performance at very fast measurement rates and ensures that it does not suffer from the accumulative inaccuracies that occur in conventional 3-axis Cartesian arrangements.

The inexpensive CNC Xtreme requires no compressed air and boasts the shortest



learning curve of any equivalent system. An inexperienced operator is normally able to become competent in the Xtreme's use in just one day, meaning that the robust CMM represents an ideal 'plug and go' solution. In addition, the Xtreme's integral temperature control function ensures that accuracy levels are maintained even when the surrounding ambient temperature is not controlled.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's renowned 3D software. A welcome bi-product of any Aberlink 3D inspection routine is that a simultaneous picture of the measured component is created on the CMMs computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, can be simply picked off as required.

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Bernard Holmes reduces reject rates to zero with Bowers

Precision engineering company Bernard Holmes Precision Ltd has succeeded in its aim for zero customer rejects with the help of Bowers Group. The company specialises in both CNC and conventional machining in a wide range of materials, with customers from a variety of sectors.

Many of the precision components measured at Bernard Holmes Precision require bore measurement and therefore the company utilises a wide variety of measurement methods. After 15-20 years of use, the company was keen to upgrade its kit and invest in a selection of new micrometers to include digital gauges, as well as to expand the variety of bore micrometers available for use.

Russell Thackray, production director at Bernard Holmes Precision Ltd, says: "We decided to start replacing some of our more used and abused bore mics that we bought over 15 years ago with shiny new ones. It's not until I had a walk around our shop that I realised how many we have and how often they get used. They are the best bore mics out there and what a great investment! They've already paid for themselves.

Based in Billingborough in Lincolnshire, Bernard Holmes Precision Ltd specialises in CNC turning and milling of high end precision components and can cater for either large or small batches, manual or CNC multi axis machining. Employing over 20 people, it's diverse customers are from a huge range of sectors, from bulk handling to hydraulics manufacturers and everything in-between.

The company has a long reputation of machining complex components with great accuracy. A team of extremely skilled precision engineers ensure that every component is made exactly to the customers' requirements. The inspection team ensures that



components are checked before they leave the factory as the company aim for zero customer rejects.

When a new employee recommended Bowers Group micrometers, Bernard Holmes Precision took their advice and ordered several, including the XT Standard Analogue bore gauges and XT Digital bore gauges. Staff are so pleased with the micrometers and the Bowers Group has truly lived up to its well-known reputation as the world's leading bore gauge manufacturer. The bore gauges are used all over the factory for convenient shop floor measurement, as well as keeping one set safely in the inspection department.

Russell Thackray continues: "We use the Bowers micrometers every day; they are an integral part of our quality management. Not only are they easy to use, they are repeatable and accurate. The most important thing is that we trust the readings implicitly. Because we know that we can trust them 100 percent, we have several other brands of mics that sit in the cupboard unused. I know that the lads can pick up the Bowers mics and use them properly. There's no learning curve, no training, and they are clear and easy to read."

Bowers Group's micrometers are compact and light, and ergonomically designed to be easy to use. With improved functionality and a wide range of measurement capabilities available, they are the perfect solution for the accurate and repeatable measurement of bores.

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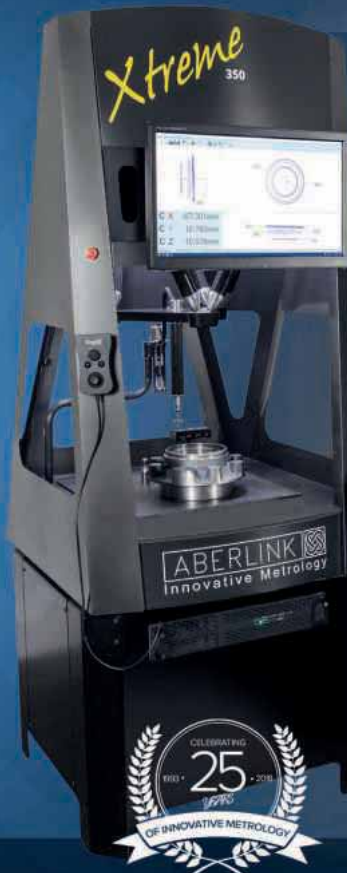


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Innovative Metrology

FTL Technology gives Mitutoyo the 'seal' of approval

FTL Technology is one of the UK's leading suppliers of precision engineered seal solutions. In addition to offering a broad range of consultancy, design and seal manufacturing services, the company also has access to a wide range of high quality products from many of the world's leading seal manufacturing companies.

Having established an excellent reputation over the past 40 years, FTL Technology has attracted customers from many of the world's most demanding of industries. The challenges faced by the food and pharmaceutical sectors can be particularly onerous. FTL Technology's in-depth expertise within these important sectors ensures the delivery of sealing products and services that meet all of the relevant food and pharmaceutical certification requirements. Illustrating the varied problems faced by the company's diverse customer base, seals and components used within the oil and gas industry face exposure to extreme temperatures, high pressures and intense chemical aggression. FTL Technology oil and gas sealing solutions safeguard operator safety and ensuring equipment reliability throughout this industry.

Given the countless demanding applications FTL Technology's products are used for, extremely high standards of quality and precision permeate all of the company's manufacturing and inspection activities. In accordance with FTL Technology's policy of continuous improvement and to help guarantee the continued quality of the company's sealing products, FTL Technology quality manager, Joanne Kite recently investigated the available high accuracy optical measuring systems that would enhance the company's important inspection functions. After considering several options, an advanced Quick Image

2D Vision Measuring System was purchased from Mitutoyo UK.

Joanne Kite explains: "FTL Technology's core strengths are problem solving and helping our customers to optimise their operation processes by the provision of premium quality custom sealing solutions.

"Having considered other optical systems, we recently further increased our precision capabilities by purchasing a non-contact vision measuring system from Mitutoyo UK. Now installed and fully operational, our Mitutoyo Quick Image machine is used for a range of precise measurement routines, such as 1st article inspections and for checking a percentage of products during a production run.

"In addition to carrying out non-destructive vision inspecting routines on seals in their finished states, as many of our products consist of multiple elements assembled into a single seal with difficult to access features, we also slice through some of our seals. This enables the Quick Image machine to accurately inspect the cross-sections of seals.

"As the Quick Image system has excellent magnification capabilities, we also use the machine to greatly enlarge the images of components, allowing us to undertake detailed visual investigations. By viewing blown-up images on the machine's screen, we are able to ensure that even the most microscopic of imperfections can be picked-up.

"Given that many companies require traceable documentation, we are now able to print both clear product images and detailed inspection reports direct from our Mitutoyo Quick Image 2D Vision Measuring System and supply them to our customers.

"As conventional measurement techniques, such as the use of calipers, micrometers and CMMs with touch probes would distort some of the more deformable materials that are used in our seal products, our Mitutoyo Quick Image machine has proven to be

an ideal quick acting and accurate non-contact measuring system."

Mitutoyo Vision Measuring Systems are available in a wide range of sizes and accuracy classes to cover practically all precision 2D and 2½D measuring applications, with every system representing an excellent investment in terms of productivity, versatility, quality of construction, training and service support.

The latest version of Mitutoyo's versatile Quick Image series 2D vision measuring system, as purchased by FTL Technology, is a high-quality system that is designed, to provide efficient, measurement in the inspection room or in the laboratory. Available with 0.2× or 0.5× magnification, the cost-effective Quick Image 2D Vision Measuring System is ideal for applications



that require distortion-free imaging with accurate non-contact measurement capabilities.

A telecentric lens provides uses with a field of view and depth of focus that makes the measurement of workpieces with multiple step heights both fast and precise, whilst the system's convenient one-click measurement function allows measurement and tolerance judgment with the click of a mouse.

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Laser reduces cutting tool measurement by 60 percent

A new laser measuring system was given its UK debut at MACH 2018 and is promising to reduce the time taken to measure cutting tools by 60 percent.

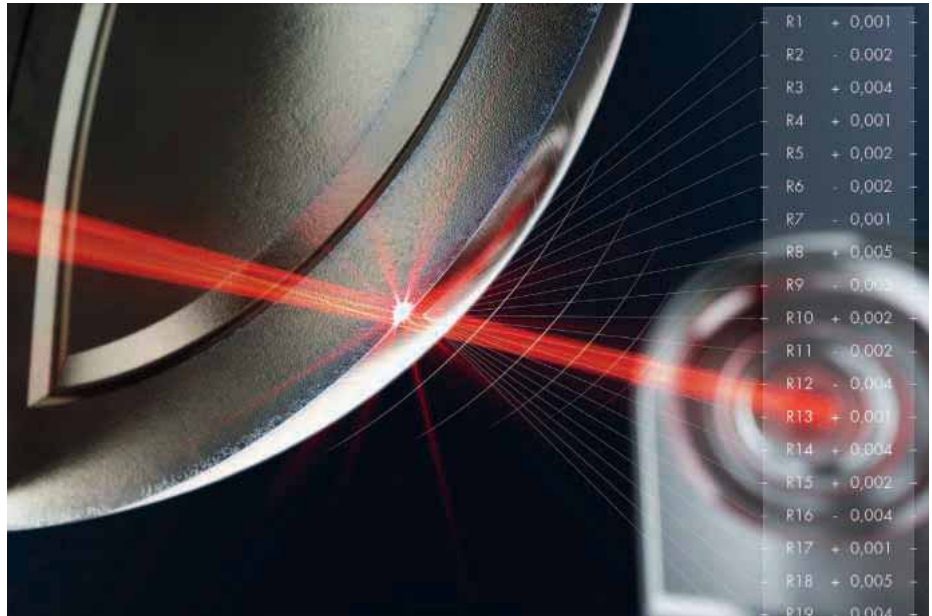
Blum-Novotest, which has 95 percent of the global machine tool market for this technology, provided live demonstrations of the LC50, the next generation of the laser and the latest addition to the hugely successful DIGILOG family.

It was fitted to a Fanuc Robodrive at the show and visitors were able to witness first-hand how the premium laser optics, new design shutter protection system and HPC nozzle provide 'ultra-reliable' in-machine measurement data.

The East Staffordshire-based company expects this new product to generate over £500,000 of new orders over the next two years, with the main interest coming from manufacturers supplying high value parts to the automotive, aerospace, F1 and aerospace sectors.

Speaking prior to the show, David Mold, managing director of Blum-Novotest in the UK, said: "This is the first time anyone in the UK will have seen this laser measurement system in action and I'm sure interest is going to be huge.

"By evaluating the analogue signal rather than the digital one, we can take thousands of measuring values of all cutting tool edges per second, resulting in highly dynamic measurement of all tool parameters. In essence, this technology is 60 percent



quicker than conventional in-machine measuring.

"Even the coolant influence is bypassed by automatically filtering out dirt and the coolant residue on the tool."

Blum-Novotest is one of the global leaders in production metrology, employing 534 people and turning over £77 m across its 16 subsidiaries.

Its UK operation was founded in 2000 by David Mold and originally started life in a small office in Lichfield. As the firm's reputation grew in aerospace and automotive, sales started to increase rapidly and a move to bespoke offices and a state-of-the-art demonstration room in Burton-upon-Trent followed in 2015.

Today, the company delivers its solutions to some of the world's largest aerospace primes, car manufacturers and a host of CNC machine tool suppliers, including the Engineering Technology Group, Whitehouse Machine Tools and Yeovil Machine Tools.

"LC50 is targeted to customers who really need to control the whole machining process and who want to implement Industry 4.0 standards in their manufacturing operations as it allows them to control the variables of cutting tool, workpiece and temperature," continued David, who oversaw a record performance in 2017.

"Laser control systems accounted for 65 percent of our turnover last year and I would expect this to increase with this new technology being rolled out across existing and new clients in the UK."

He concludes: "There's no reason why we can't achieve in excess of £500,000 of orders between now and 2020."

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BLUM
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Laser projector simplifies and optimises production and assembly processes

The positioning, alignment, assembly and welding of parts and components are indispensable but often problematic tasks in multiple sectors. The new FARO TracerM Laser Projector provides operators with an indispensable ally that enables them to perform these tasks quickly, accurately and with maximum safety.

Ideal for companies operating in the aerospace, automotive, heavy machinery, shipbuilding, railway, composite materials, metalworking and metal component manufacturing sectors. FARO's new 3D laser projection system supports highly efficient, accurate laser-driven assembly and production operations.

The FARO TracerM accurately projects a laser onto a surface or 3D object, providing a virtual template which enables companies to improve productivity, reduce waste and eliminate rework. The laser template is created using a 3D CAD model that allows

the system to visually project a detailed laser contour of parts, components or areas of interest, removing the need for physical templates and tools and reducing the potential for human error.

The FARO TracerM offers an accurate, variable and long-range projection from 1.8 to 15.2 metres (6 to 50 feet). It also uses the Advanced Trajectory Control (ATC) function, which ensures fast projection with excellent dynamic accuracy and a fast refresh rate, minimising the "flicker" associated with other laser projection systems.

FARO's innovative 3D laser projection system can also be used in series for large assemblies. Multiple TracerM projectors can be controlled from a single workstation to provide a virtual template in a single or shared coordinate system.

FARO TracerM Laser Projector is a solid and reliable solution. Thanks to its proven



technology, it is suitable for the typical environmental conditions of all production departments. The ability to accurately locate and orientate individual components and direct assembly sequences increases efficiency and production quality, eliminating nonconformities and reworking's that incur significant additional costs.

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Creaform launches the CUBE-R

The most recent innovation from Creaform offers an off-the-shelf fully integrated automated inspection solution as an alternative to CMMs in sheetmetal, casting and composites.

Creaform has launched the CUBE-R, a new generation of complete turnkey automated dimensional inspection solution. The new optical 3D measuring machine capitalises on the MetraSCAN 3D-R metrology scanner and combines efficiency and reliability of robotisation in an automated industrial measuring cell.

The CUBE-R extends the 3D digitising and inspection capabilities of the MetraSCAN 3D for the dimensional measurement of parts ranging from 1 m to 3 m with metrology-grade volumetric accuracy in real-life shop-floor conditions. Unlike conventional systems, the CUBE-R delivers both speed and volumetric accuracy. In addition, it ensures a significant increase in productivity. The CUBE-R offers a realistic and comprehensive alternative to coordinate measuring machines (CMM) and other robot-mounted, structured-light 3D scanners.

Key features and benefits include: High

productivity: performs effective inspections on several hundred parts a day (even on dark or reflective parts with complex geometry); Multitasking: maximises production cycle and throughput by offering a simultaneous operation of data acquisition and analysis in a continuous and uninterrupted measurement flow; Automatic field calibration procedure: no accuracy drift over time and continuous operation; Minimum operator training: easy to use and short learning curve to keep up with fast production pace; Complete turnkey solution: no integration required, fully enclosed and shop-floor ready; Smaller factory footprint: a complete 4.1 m x 4.1 m x 3.1 m turnkey solution with a flexible shop-floor configuration.

"Quality control managers are looking for integrated solutions that enable the detection of assembly problems earlier in the manufacturing process, all while reducing waste and down time to ensure better productivity and higher product quality," says Jérôme-Alexandre Lavoie, product manager at Creaform. "The CUBE-R was designed with that in mind. It is the latest addition to our R-Series



automated inspection solutions, which also include technology integration for clients looking for customised dimensional measurement solutions."

The CUBE-R made its first public appearance at Control in Stuttgart, Germany last month. A "CUBE-R" video is available and gives insight into the shop-floor ready solution's integration and operation in the production environment. Customers also are invited to join a free webinar to learn how the CUBE-R solves productivity issues caused by pressure at the CMM.

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VERICUT FORCE awakens in Czech Republic

Over 30 visitors from leading advanced manufacturing and technology companies based in the Czech Republic attended CGTech's first VUE 2018 (VERICUT Users Exchange) event, hosted by SECO at the company's Technical Centre. The technical staff from CGTech's country reseller, Axiom Tech, used the event to promote the new FORCE module as well as providing customers with a comprehensive review of the latest release of VERICUT, Version 8.1, the world's most advanced independent CNC machine tool simulation and optimisation software.

Shown for the first time overseas, CGTech's recently launched physics-based FORCE module grabbed centre stage at SECO's advanced Technical Centre facility in Brno. Here, live cutting demonstrations of the software enhanced machining cycles for hard metals were run on the company's DMG MORI DMU 60 eVo 5-axis machining centre to highlight the benefits of FORCE in use on the shopfloor.

FORCE is a software module within VERICUT that uses a physics-based optimisation method to determine the maximum reliable feed rate for a given cutting condition based on four factors: Force on the cutter; spindle power; maximum chip thickness; maximum allowable feed rate. It calculates ideal feed rates by analysing tool geometry and parameters, material properties of the stock and cutting tool, detailed cutting tool edge geometry, and of course VERICUT cut-by-cut contact conditions.

The software excels in difficult-to-machine materials, especially complex multi-axis cuts such as 5-axis flank milling. Initial users of this technology are already seeing productivity improvements of up to 50 percent. FORCE represents the current apex of machining optimisation because the



software uses actual data for cutting tool forces and spindle power readings to calculate maximum chip thickness and feed rate. It therefore offers a number of technical benefits for machined parts within aerospace, automotive, industrial and other markets that use automated machining.

With the material properties of the component and the cutting conditions also considered, FORCE determines the optimum speeds for a cutting process and makes the CNC machine cut in the most efficient, fast and reliable way. This provides significant benefits when applied to any precision machining operation where challenging materials, such as titanium, high nickel superalloys such as Hastelloy, Inconel and Waspaloy, duplex and stainless steel, plus any work hardening materials typically used in mould & die and aerospace component production.

Petr Zugar, managing director, Seco Tools CZ, says: "Working with CGTech to promote VERICUT FORCE provides an opportunity for SECO Tools to support the goals of every industry sector; improved efficiency and productivity. We believe the major benefit for our customers is reduced production costs – in terms of both the cutting tools needed and especially capacity of existing machine tools. In this sense, we provide our customers with a 'significant competitive advantage'. They can produce parts faster and at a lower cost than the competition."

The machining demonstration created jointly by SECO and Axiom Tech reflected the typical challenges faced by aerospace companies, with a section of blisk (blade on disk) produced from titanium. A range of cutting tools from a SECO programme were applied with advanced machining strategies, including plunge and high-speed milling. Across the blisk machining

operation a time saving of around 19 percent was achieved by FORCE.

Axiom Tech also provided everyone at the event with an overview of the changes and improvements offered by VERICUT Version 8.1, which is designed to run on 64-bit Windows on Windows 7 and Windows 10 computers. This latest release is focused on the various tools that can increase NC programmer efficiency, reduce production time, and detect costly errors before going to the shopfloor.

Country sales manager, Lee Fowkes concludes: "FORCE provides a 'purple patch' for companies using machine tools. It can increase the life expectancy of the cutting tools; improve the post-processed cutting tool path from the CAM system, leading to shorter machining cycle times; look after the machine tool's structural elements, as each cut is analysed the software minimises any 'shock loads' creating a smoother but quicker cutting cycle."

CGTech's VERICUT software is the standard for CNC simulation, verification, optimisation, analysis, and additive manufacturing. CGTech also offers programming and simulation software for composites automated fibre-placement, tape-laying, and drilling/fastening CNC machines. VERICUT software is used by companies of different sizes in all industries. Established in 1988 and headquartered in Irvine, California, CGTech has an extensive network of offices and resellers throughout the world.

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Latest news from Jetcam

JETCAM has announced new versions of its entire range of core applications, which now also include CrossTrack for Sheet Metal and new iOS/Android apps. The releases herald JETCAM's continuing move into total automation and Industry 4.0 support for the sheet metal and composite manufacturing sectors.



JETCAM Expert v20 includes JET-Cut, which allows complex grids of holes to be laser cut using artificial intelligence that is far quicker than traditional methods, without the user having to specify which areas should have the logic applied. It applies logic on any suitable geometry, allowing users to import a CAD file, apply profiling information and nest components in seconds, fully automatically. JET-Optimizer delivers a highly optimised sequence of cutting internal holes to minimise machine movements while trying to avoid travel over already cut holes.

Overall, JETCAM Expert benefits from hundreds of changes across all areas of the software, support for over a dozen new machines and many enhancements to various existing postprocessors.

JETCAM Orders Controller (JOC) version 3 enjoys dozens of feature enhancements over its predecessor, including a powerful new batch nest report, completely redesigned nests screen and integration into JETCAM's Line Commander line management software.

Version 5 of JETCAM's award-winning composite manufacturing suite CrossTrack is now available for the sheet metal industry, delivering enterprise-level tracking of material, complete automation of the nesting process, order management and shop floor nest scheduling. Using MS SQL Server, CrossTrack provides real-time location information on raw material, assemblies and individual parts, as well as providing tight integration into JETCAM Expert. Tight integration and data exchange with existing systems such as MRP is also provided.

CrossTrack also benefits from the launch of mobile versions of its Material Transfer Station. Available in both iOS and Android formats the application allows users to quickly scan the barcode of material or parts to facilitate location transfers or obtain information. The apps themselves are free to download and use customers' existing Material Transfer Station licenses.

All the above updates are available free to existing customers with a current maintenance contract.

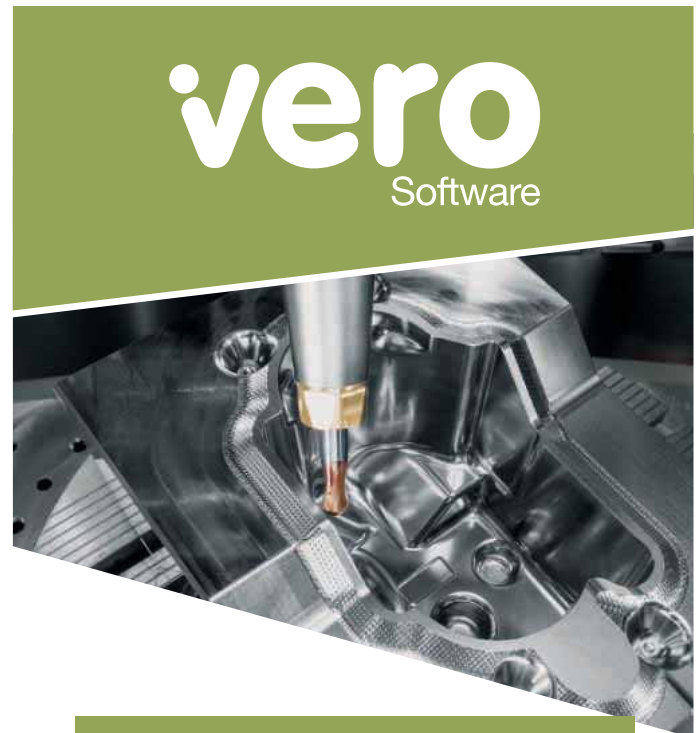
Also being launched with Expert v20 is the latest version of JETCAM's High Performance Nesting option, delivering even greater material efficiency faster than ever before for both single and multi-sheet nesting operations.

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Radan macro adds shine for commercial kitchen specialist

A bespoke Radan macro, written specially for a commercial kitchen manufacturer, has overcome a major design issue by completely revolutionising its project nesting.

Shine Food Machinery need the grain flow and top faces on its sheet metal components to be consistent, for the aesthetics of the product. With the macro, Radan's powerful project nesting ensures Shine's unique requirements are met every time.

Neil Thorne, senior design engineer at Shine, describes Radan as a software that "runs the factory" and is "a vital and integral part of our processes."

Shine has been trading for over 40 years, delivering in excess of £100 m of solutions to commercial catering environments within the last decade. Its vast customer base spans from small cafes and schools to large £2.5 m contracts with the Ministry of Defence. Shine's solutions are all delivered in-house from its headquarters in Newport. Projects start with their design team, through to manufacturing and installation.

Neil Thorne explains: "After we've won a contract, we'll design the individual components for the kitchen, such as the extraction systems, tabling and servery counters, in SolidWorks. Once the client approves the design, and site dimensions are taken, we then provide the factory floor with manufacturing drawings. The

components are nested, laser cut, folded, welded and assembled. The finished product is then inspected before being delivered to site to meet installation dates."

With each job being completely bespoke, Shine manufactures thousands of different components a year, each requiring their own CNC code. For example, a full servery counter alone could contain 200 different components. Shine uses Radraft, Radprofile and Radnest to accurately and efficiently cut every sheet metal product with a Bystronic Bysprint 3015 3 kW laser.

Neil Thorne says: "It's very important that the parts we manufacture are accurate and within tolerance. Without this, we will encounter problems at our assembly stage. We find Radan flat patterns and nests the components extremely accurately from SolidWorks." Design engineer Steffan Owen adds: "Everything's cut millimetre-perfect and quickly."

Despite the high level of accuracy and nesting efficiency achieved using Radan, the company came across an issue resulting from design constraints and human error.

"For the aesthetics of our finished installations, we're governed by grain



direction on the sheets. We can't have neighbouring cabinets with the grain going in different directions; the grain all has to go the same way. This was a problem for us because, when the project was going into Radan, the software was nesting in the best orientation for sheet utilisation and sometimes we didn't have the correct top face and the grain was in the wrong direction. We needed to overcome this without having to nest everything manually."

After considerable discussions with Radan brand manager Olaf Körner and Radan's team of developers, a macro was created specifically for Shine to solve this issue. Olaf Körner says: "As a company, Radan was challenged by the specific requirements at Shine. The high volume of parts in a project and the high-quality materials used, required a highly automated and at the same time very reliable process. With input from the engineers at Shine, we put together a specification which allowed us to put a process known as the 'F-Stop' in place, that allows Shine to produce the kitchens with a minimal risk of costly errors."

At the design stage in SolidWorks, a 5 mm letter 'F' is put on the top face of the panel, which indicates the correct grain direction. Neil Thorne says: "Thanks to the macro, when Radan is flat patterning it determines from the F-Stop which is the top surface and which way the grain has to go. Radan then nests with the correct top face and the grain going in the right direction, rather than purely to optimise sheet usage. This is extremely important for the aesthetics of our finished installations and it stops issues on the factory floor. Previously, things could



be nested either in the wrong orientation or upside down and even folded the wrong way in the press brake and had to be scrapped. The amount of scrap we now produce has reduced dramatically."

Due to the success of the F-stop macro developed for Shine, Radan is now working to include this feature in a future general release of the software, to benefit all of its customers.

Shine has also seen huge time-saving benefits from the standard features of the software. Neil Thorne says: "From drawing approval from the client to getting our products to site requires a fairly quick turnaround, so as soon as the drawings are approved we need to get it on to the factory floor and manufactured as quickly as possible and Radan enables us to do this, taking days off flat patterning for a big contract." Steffan Owen adds "A school which would have previously taken a few days, has taken just 45 minutes."

Although the volume of scrappage produced has been largely reduced, Radan also allows these remnants to be optimised. Steffan Owen explains: "For offcuts, we use the remnants feature. Our scrap used to go in the bin, but now every offcut is put back in

the system and the first thing Radan does is to look at a remnant first rather than use a new sheet. That way we're saving on material as well."

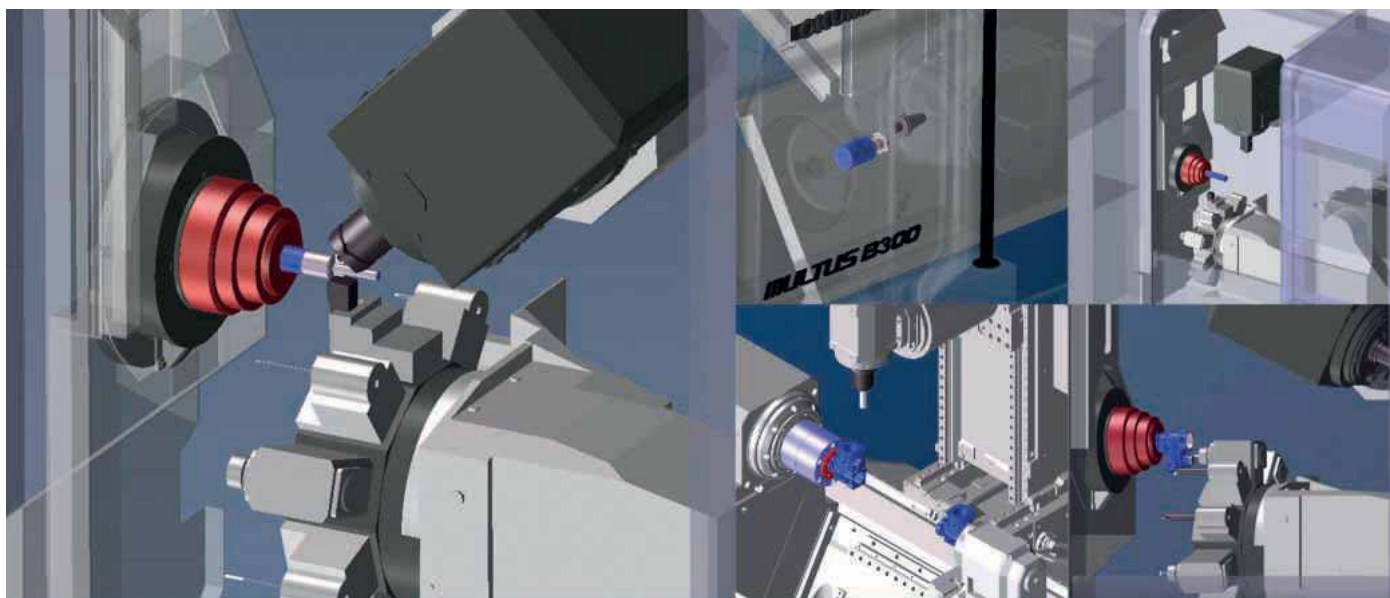
Using the projects and labelling functions have also increased efficiency. "By using projects, we know where everything is. The factory floor relies on it a lot, along with the labelling system. All parts are labelled automatically which is really crucial for identifying which components are for what job, what the contract is, and what the item number is. Previously the labels would be handwritten for every part, which was time consuming and any contract could have well over 1,000 individual parts. Now the labels are printed automatically, and our laser operative simply peels them off and puts them on the part, so every part can be readily identified on the factory floor."

The increase in efficiency and production rate in the cutting operation has introduced a need for further investment in the factory to stop a current bottleneck at the bending stage. Shine will shortly be commissioning a third press brake to fully benefit from the increasingly fast rate that the flat components are coming off the laser.



In summary, Neil Thorne says: "Radan runs the factory. It's a vital and integral part of our process. It cuts down the amount of time we spend nesting, especially with the F-stop macro. Everything's organised and easy to identify with the labelling system, which is vital to us as many contracts are run with thousands of components. With Radan we are benefiting from fast production, accuracy and saving on materials from the reduction in errors and optimisation of remnants."

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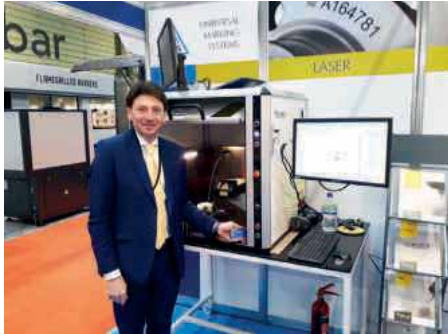
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The mark of success

Recently appointed as the UK technology partner of French metal marking specialist Technomark, leading solutions provider Universal Marking Systems (UMS) used MACH 2018 to present an impressive range of marking machines and equipment, both stand alone and as part of the production process.



Laurent Baud, president and director general of Technomark, says: "My partner and I began our business in a garage in 2000. We now have more than 8,000 customers worldwide and 16,000 installations. With the partnership with UMS, we are very confident about the future. Our equipment is very user-friendly and our approach is "what you see is what you get."

UMS has an unrivalled, industry leading range of electrochemical marking systems going back 75 years and is now promoting the OEM Dot Peen product range by Technomark, demonstrating the close relationship that has been forged between the two companies giving the best support for the UK market.

Technomark has brought some exciting new patented advancements to dot peen marking technology to improve performance which include Intelligent Driving Impact (IDI), which detects any differences in height in the surface of the material making it ideal for marking undulating or uneven surfaces whilst maintaining the same high-quality marks. The machine automatically compensates for the differences, therefore doesn't require any operator intervention.

Another advancement is Intelligent Impact Control (IIC). This function saves the operator from having to set the stylus distance from the marking face relative to the marking power used. The machine automatically calculates the correct force to be applied to achieve the desired depth of

Flexmark Combo 2-in1 System



mark. The dot peen range offers Portable, Bench top or integrated solutions as well as a versatile Combo 2 in 1 concept offering great value for money and ideal for subcontractors.

The Combo system is a unique offering in the market that combines both a benchtop and portable hand-held system all in one. UMS believes that the pricing makes it the best price/value/quality machine currently on the market. It is ideal for subcontractors that have small components that need to be marked using a column-based system or with the addition of an optional rotary drive for marking cylindrical parts. For larger parts, the machine can be changed to a handheld in under 10 seconds without using any tools. The system has been designed to be best of breed both as a hand held and a



column system, with no compromise for usability, robustness or functionality.

The combo is available with two variations of controller which differ only in functionality, not build quality. The Flexmark is ideal for standard alphanumeric text marking which can be used with an optional rotary drive. It has a 120 x 60 mm marking window, making it ideal for large marking areas such as nameplates in the column mode, but also versatile enough for marking on bar stock and larger components requiring traceability. It can handle incremental numbering such as serial numbers, date/timestamp, text on an arc etc.

The Multi4 controller is built to the same high standards as the Flexmark, but has increased functionality and flexibility



New Multi4 Mini

including 2D barcodes. The software is extremely easy to use, and an operator can be up and running in minutes. The Multi4 system is also available as a dedicated benchtop system and with Autosense meets the strict criteria of Aerospace/Nuclear applications. Heads are also available for integration as the Multi4 has I/O capability.

The Multi4 range offers four different sized marking heads to give a wider variety of marking window sizes from 50 x 60 mm up to 200 x 200 mm. An integral battery and charger is available to enable true portability if using the hand-held version. The bench system also has a convenient quick release height adjustment on the Z-axis as well as an optional powered Z-axis.

The robustness of the machines can be demonstrated with the use of Linear X- and Y-axes which is standard on all marking heads. This maintains quality of mark at the extremity of the marking path, meaning that the whole mark has the same quality. As the stylus pin is always perpendicular to the marking surface, the side loads are reduced. This minimises the risk of stylus pin breakage or sticking. All the marking heads are manufactured from a cast aluminium frame which gives rigidity and high strength.

"As the leading manufacturer of electrochemical marking equipment since 1963 and a long history in dot peen and laser marking, our priority is to provide reliable, robust equipment that is fully featured coupled with ease-of-use. These were the key factors that lead us to the partnership we have now established with Technomark", says Jeff Sawdy, managing director of Universal Marking Systems.



Now widely adopted in automotive applications due to its versatility and robust construction, the M4 Inline controller has been specifically designed for production line integration and machine building purposes. The extremely compact controller can have optional mountings for a 19" rack, has an extremely user-friendly interface and is built with 16 way I/O's which are configurable between an input or an output and can be set up as a volt free PNP or NPN connection.

The latest addition to the dot peen range is the brand new innovative and ultra-compact "Mini" portable marking machine available both with the Multi4 or Flexmark controller. Its unique design allows the marking head to be positioned in any orientation. Its light weight of 2.3 kg and even weight distribution make for easy handling and positioning. The marking window is 60 x 30 mm and it can be

completely portable with the battery and cart option (Multi 4).

Also new to the UK is the Graphix fibre laser. It comes as an innovative compact laser marking workstation or an integrated laser solution for automated production line marking.

This Graphix Workstation model features a door that opens in two positions, allowing fast access for loading and unloading components. It can accommodate a maximum part size of 500 x 500 x 300 mm and has a standard marking window of 100 mm x 100 mm, although larger window sizes are available. The electronics are built in and the powerful software is extremely easy to use. It boasts a motorised Z-axis as standard, with programmable positions to allow marking at different heights within the same program. The column and head can be repositioned if required to give a more flexible working area of four marking zones, with two positions in X and Y. Optional extras include rotary axis, reading capability, fume extractor and adapted lens for different marking window sizes.

The Graphix Inline laser offers high speed marking for medium to large production runs. It is very simple to implement with its two positioning long life diodes. It has a compact light source, galvo head and lens that easily integrates in any position and can have up to four axes. It also features an auto-diagnostic system which gives real time management of the laser operating state.



M4 Inline

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Manufacturing the impossible

Photo chemical etching can machine metals that conventional processes find too difficult

For designers looking to manufacture burr and stress-free metal parts with complex geometries, maintain the flexibility to make last minute design changes and mass produce prototypes quickly, photo chemical etching is increasingly seen as the answer. Chemical etching offers both an economical and efficient solution, and allows for the mass production of incredibly intricate, thin metal parts at a fraction of the cost of other methods.

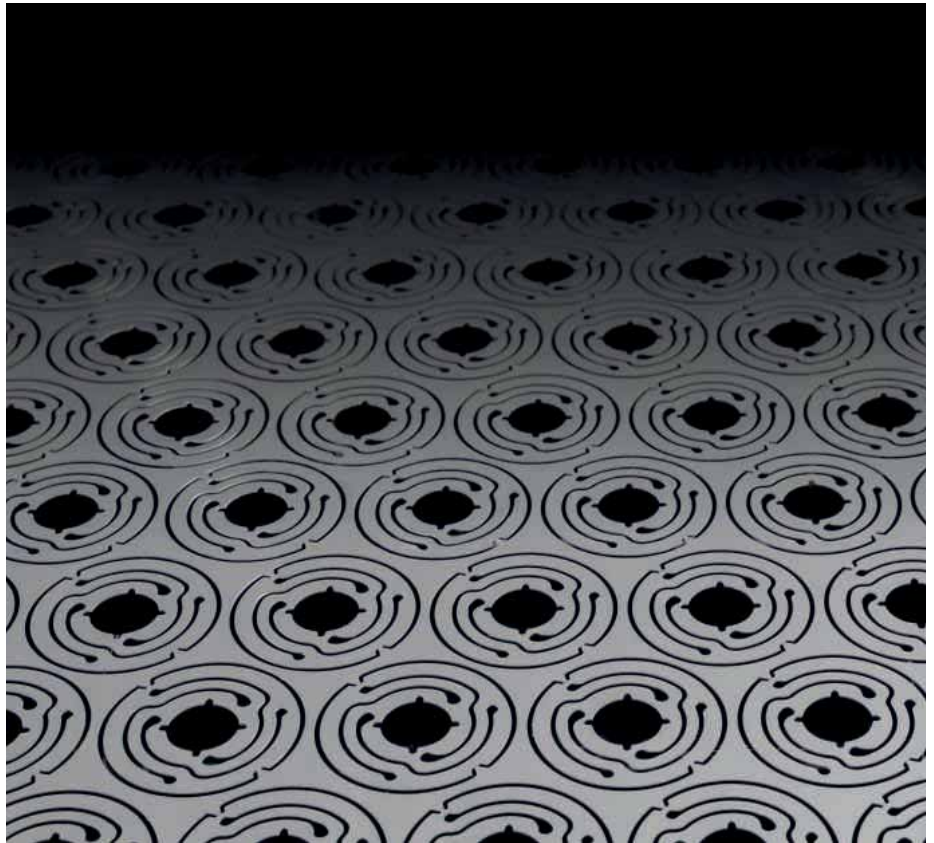
Today's OEMs don't just need parts produced quickly, they also need them to be affordable. In addition to fast production speeds, chemical etching is often the most economical option for producing custom parts with complex designs and strict tolerances and, unlike other metal manufacturing processes, the cost of photo chemical etching rarely ever increases with design complexity. This frees design engineers to utilise their creativity and to innovate when designing metal parts, without the worry of incurring additional fees for intricate details.

The use of inexpensive and easily reworked photo-tools in chemical etching allows for design configurations not typically possible with other metal fabrication methods. Chemical etching even offers the ability to produce parts with different geometries at the same time, on a single sheet of metal. The ability to use mixed graphic tooling to produce multiple part types in one production run is one of the greatest cost-saving advantages offered by the process.

However, there is another key advantage of photo etching and that is the fact that through constant investment in R&D, leading practitioners like Precision Micro can apply the process to a vast palette of metals, even those notoriously difficult to machine such as titanium and aluminium.

Titanium and its alloys have gained widespread applications in the aerospace and biomedical industries as they are lightweight and strong, have excellent fatigue performance and offer high resistance in aggressive environments. It is unfortunate, however, that these favourable properties prove to be a curse during conventional machining.

Due to their high strength, low thermal



conductivity and chemical reactivity with tool materials at elevated temperatures, titanium and its alloys pose a hazard to the tool and significantly reduce tool life. In addition, a relatively low Young's modulus of titanium alloys leads to spring-back and chatter when machining causing poor surface quality on the finished product. In addition, during turning and drilling, long continuous chips are produced, which can lead to entanglement with the cutting tool, making automated machining near impossible.

The use of photo chemical etching overcomes many of these issues, but even etching titanium is difficult, as the metal forms a protective oxidised coating when exposed to air, meaning it cannot be etched with standard etch chemistries. Precision Micro has overcome this problem and is, therefore, one of the only photo etching companies in the world that can offer photo etching of titanium on a production scale.

Precision Micro specialises in etching biocompatible cranial, dental, and pacemaker battery meshes for the medical

devices market. These complex and sometimes ultra-thin meshes benefit from the fact that photo etching manufactures all openings and countersinks simultaneously, therefore making it more economical than competing laser cutting and machining processes.

Aluminium exhibits many of the attributes of titanium, notably its high strength to weight ratio and natural corrosion resistance, but at a lower cost. Whereas titanium is stronger and more corrosion resistant than aluminium, it has a relatively low fatigue limit, which makes aluminium well suited to aerospace applications where fatigue limits must be high.

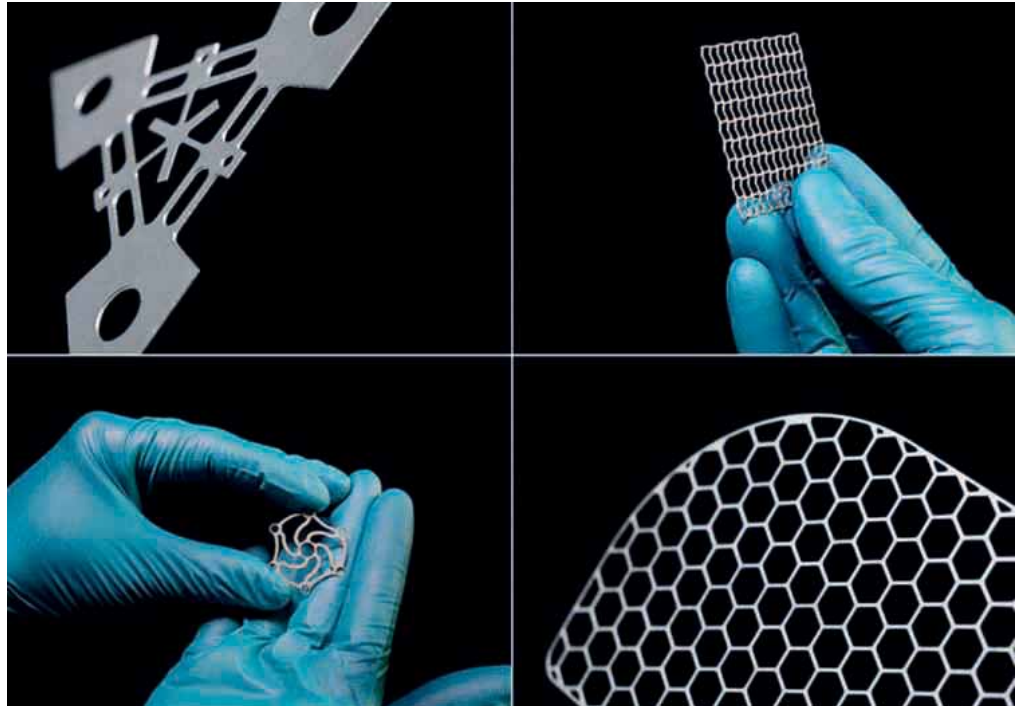
One of the biggest problems when conventionally machining aluminium is what is termed "the built-up edge", essentially the welding of work-piece material to the tool edge and the loss of effective geometry which causes increases in cutting forces and quality problems such as scratches in the surface and cloudy finish.

Aluminium is also difficult to photo-etch effectively as the heat energy it releases

during etching often results in a rough, granular edge. Precision Micro has developed a proprietary method for etching aluminium and its alloys, producing edge profiles comparable with those etched in stainless steel. It is also AS 9100 accredited, the quality management system standard required to supply the world's leading aerospace, space, and defence businesses.

Typical applications include light-weight helicopter air intake grilles and heat transfer plates used in aircraft dehumidifiers and engines, the latter often requiring multiple designs which can be set up cost-effectively with photo etching and include smooth channels to improve airflow.

Precision Micro has over 50 years' experience as a photo etching specialist, and its continual investment in research and development of chemical etchants and process parameters means that today, even the most challenging metals can be processed in volume and to high levels of accuracy and repeatability.



For over 50 years, Precision Micro has pioneered chemical etching. The company has won a reputation as the industry innovator, trusted to deliver by major global manufacturing concerns across multiple markets.

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Laser marking points the way to reliable traceability in automotive applications

Lasers can handle almost every industrial direct part-marking task, marking through colour change, ablation, carbonising, annealing or engraving.

Lasers have the capability to produce all the content desired or needed, including 1D/2D and alphanumeric codes, serial numbers and lot codes etc. Even logos, images, graphics and customer-specific content can be produced efficiently and repeatably, ensuring accurate and reliable traceability throughout the lifecycle of the product. This article, from TLM Laser, FOBA Laser Marking & Engraving's UK and Ireland distributor, highlights just a few of the areas where lasers have made their mark on automotive components:

The automotive industry increasingly relies on traceability at all stages of manufacture, from tracking components within the supply chain, ensuring that the correct parts and options are built into each vehicle and managing component reliability issues or vehicle recalls.

The indelible nature of laser marking means that the information marked on the part will always be present for identification and traceability purposes. This also helps guard against fraudulent or fake parts entering the supply chain. The durability of laser marking makes it the ideal process for resistance to high-temperatures and even micro-sized laser marks, applied to a wide range of metal types, can resist extreme operating conditions.

It is no surprise therefore to find laser-marked information on many engine,

drive train, brake or other safety critical components. Laser marked information can even be found on many smaller components such as bearings.

Dual mass flywheels are laser marked within an automated assembly line using a FOBA Fiber Laser (DP30F). A vision system, fully integrated with the laser, checks if the Data-matrix code produced is clearly legible. The laser-marked code contains information such as serial and lot numbers, date of manufacture and other additional information. The laser, vision system, software and handling system are all integrated within the production line to achieve the highest levels of production efficiency.

Ultra-high contrast marking on metal

Lasers are also able to produce the ultra-high contrast marks required on complex substrates, such as those found on the castings that are widely used within the automotive sector. The very nature of a casting surface, with its diverse range of grey-scales and the subsequent shadows caused by varying or poor lighting conditions, could make reading the information difficult due to poor contrasts. However, it is possible to generate an optimised black/white mark which results in much better readability. Producing black codes in the metal and, in addition, using the laser to lighten the peripheral areas as well as the spaces in-between, creates this high contrast and easily readable mark.

Lasers are also making significant improvements to production efficiency and, in this example, process steps were removed by the introduction of a laser



Pre-oiled ball bearings can be successfully marked using one of FOBAS pulsed fiber lasers

marking solution. The fully traceable black marks on a ball bearing were produced using a pulsed fibre laser from FOBA. Whereas previously, oil present on the parts had to be removed to allow the original etching process to take place, the laser can mark the oiled parts without cleaning. This not only saved the pre-etching cleaning process but the subsequent re-oiling process that would have been required following etching.

Now - Ultra-fast metal marking

The latest addition to FOBA's range, released at the beginning of 2018, is the Y.1000. This new 100 W fibre laser marking solution is perfect for high speed and high performance industrial laser marking applications and achieves a 40 percent increase in speed and throughput compared to its predecessor. This small, yet powerful fibre laser is ideally suited to marking the diverse array of component parts used in automotive manufacturing.

FOBA laser marking systems are available within the UK and Ireland from Bromsgrove-based distributor TLM Laser, who also offers application advice plus spares and service support for all laser applications.

TLM Laser

Tel: 01527 959099

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www.tlm-laser.com



Dual mass flywheels are laser marked using a FOBA Fiber Laser and then checked with an integral vision system



FOBA Lasers can be used to produce high contrast marks on complex substrates

Solutions for laser marking metals

Various laser marking processes can be used to laser mark different metals. Depending on the industry and the application the methods of laser marking may vary.

Reliable and permanent

In machine construction, high quantities of metal parts need to be marked with UIDs, barcodes or 2D codes to ensure traceability. Serial numbers, time stamps and company logos are also often required. The marking should be resistant and withstand mechanical stress and weather influence. For a large number of components or workpieces, marking times are critical and a fast method like laser marking is ideal for the task. Depending on the material, the suitable marking processes can be annealing, polishing and deep engraving. For example, stainless steel can be laser marked through annealing without leaving a tangible depression on the surface. From soft metals like aluminum over steel to very hard alloys, a broad range of metals can be marked with Trotec laser marking systems.

Flexible and environmentally friendly

High speed metal marking is also particularly useful for marking tools and precision tools like turning, milling and drilling tools. A laser marking system offers the flexibility to mark even very small and fine structures with highly legible and durable markings. The contact and chemical free laser technology ensures that there are

no changes in mechanical properties and wear and tear is kept to a minimum. The laser beam as the most complete tool for any metal or alloy ensures an environmentally friendly and economical production. High contrasts can be achieved through a combination of annealing and polishing.

For example, barcodes and texts can be annealed and the background polished for maximum legibility.

Durable and biocompatible

Various metals such as stainless steel, high alloy steels, titanium and titanium alloys are used in medical engineering for medical instruments as well as implants. These need to be marked in the highest quality and require reproducibility of the marking. Unlike other conventional methods laser marking ensures that UDI codes and serial numbers that are required by law in medical engineering are marked without causing any damage to the surface structure of the material. As there are no depressions at all in the material, no germs can settle in the material and the marking is still legible even after thousands of cleaning processes. Thus, the process of annealing ensures that the



markings that provide traceability of the products are resistant and biocompatible.

Suitable laser solution

Within the wide product range of the SpeedMarker Series, you will find the suitable laser marking system that best meets your requirements. These machines are delivered with the performant SpeedMark laser software for flexible and reliable industrial applications and environments and are ideal for high-speed laser marking high quantities in various shapes and sizes.

Trotec was formed in 1997 from a research branch of Trodat and has since become a world leader in the field of laser technology and laser manufacturing. As part of the Trodat Trotec Group, Trotec develops, manufactures and markets laser systems for marking, cutting and engraving, as well as manufactures and supplies a range of engraving materials. Trotec sets new standards, serves customers in more than 90 countries and has more than 500 employees worldwide.

In 2015, the Upper Austrian laser manufacturing company's revenue exceeded €100 million for the first time. The high-technology laser systems manufacturer relies on the ongoing expansion of its technological lead and customer orientation. The field staff are qualified and continuously trained by Trotec's in-house Academy. With 17 sales subsidiaries and an export quota of 97 percent, Trotec is highly active internationally.

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Specialist subcontractor invests in Flow technology again

Cross Engineering Swansea Ltd recently ordered its second Flow waterjet for its facility near Swansea. The new system is the Mach 500 Series featuring a dual Z-axis system with Dynamic Waterjet®.

The company purchased its first Flow waterjet at MACH 2008 in the shape of the WMC model with dual head cutting. For the new machine, Cross Engineering wanted to move forward with technology and be able to eliminate taper and jetlag from the cut parts. It consequently went into the market and assessed various suppliers of waterjet systems before making the decision to purchase the Mach 500 from Flow.

All waterjets exhibit stream lag and taper when cutting through material, but Flow's patented Dynamic Waterjet with Active Tolerance Control™ compensates for these inherent errors. Dynamic Waterjet produces more accurate parts at significantly higher cut speeds than parts cut with a standard waterjet. Utilising advanced mathematical cutting models, SmartStream™ technology controls an articulated wrist to automatically tilt, compensating for the stream lag and taper.

The new Mach 500 exhibited for the first time in the UK at MACH 2018, is the latest machine tool platform which offers the robust and mature Dynamic Waterjet technology. The Mach 500 combines the latest in machine architecture and waterjet cutting technology with comprehensive service and support programs. The main fields of use are machining metals such as aluminium, stainless steel, copper and brass, synthetic and natural stone and composite materials as well as cutting glass and plastics.

With the Mach 500, Flow has successfully doubled acceleration versus previous models. This means a 15 to 30 percent reduction in cycle time relative to the Mach 3b, the company's best-selling waterjet cutting system worldwide. The Mach 500's Z travel height is 50 percent larger at 305 mm and machine repeatability of 0.03mm. The modern electrical system improves reliability of the overall system and reduces complexity. The latest generation of FlowXpert® CAD/CAM software is capable not only of designing complete 3-D models



and assemblies but also of simultaneously calculating optimum cutting paths.

Cross Engineering Swansea Ltd has been established over 50 years, specialising in jigs, fixtures and special purpose machine build. Its fabrication department produces high quality work in stainless steel, mild steel and aluminium. The company offers a full engineering service to all local and national industry and, with the introduction of abrasive waterjet cutting technology, has added another invaluable service that will surely benefit customers old and new.

The precision engineering workshop provides a full range of equipment required to service local and national business in a wide range of industries from steel making, pharmaceutical, food, petrochemical to the general engineering and structural sectors. The company prides itself in offering each customer personal attention, regardless of the size of project.

Cross Engineering has a highly skilled workforce of 16 time served toolmakers, machinists and fabricators, with vast amounts of experience through all engineering disciplines and skills, with some of them having been with the company for over 30 years.

It has begun an apprentice training scheme, with two apprentices at present, and aims to employ a new trainee every two years in order to keep its engineering expertise rolling on for years to come.

Managing director Alun Looker started his apprenticeship at ICI as a fitter and turner in 1956. When qualified, he left to work as a maintenance and plant installation fitter at 3M Gorseinon. After three years, he moved on to a short employment at INA bearings as a foreman, from where he moved on to be



an estimator at British Steels Machynys machine shop, leaving after 12 months to go back on the tools at National Standard in Bynea for a short time.

Not satisfied with working for someone else, Alun and his wife Angela decided to start their own engineering company and in 1966 and Cross Engineering was established, initially working from a garage at home in Llanmorlais. In 1970, they secured land at Garngoch Common from the council and began building a new workshop. The rest as they say is history. The company went from strength to strength and has now been established for over 50 years.

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After 27 years of providing high quality spare parts, consumables and machine servicing to the UK waterjet cutting industry, AMC Jets Ltd has teamed up with TECHNI Waterjet, offering the very latest in waterjet cutting equipment to the UK market.

TECHNI Waterjet has been operating for over 29 years and has an installation base of almost 1,000 waterjet machines or water cutting systems spread across six continents and some 26 countries. It has dedicated sales and service offices in the USA, Australia, Asia and Europe, with spare parts, sales and service support throughout the world.

TECHNI Waterjet was formed in 1989 by Darren Reukers and Glenn Langdon to provide robotic and automation systems to the automotive industry. The company grew quickly and found a niche in the robotic waterjet market, for high speed trimming of automotive components such as: roof linings, floor and trunk carpets, door trims and instrument panels. This led to the development of what is today one of the world's finest profile waterjet cutting systems, the "Techjet."

TECHNI Waterjet is committed to offering machines of the highest quality. The Techjet has been designed specifically for the very tough abrasive waterjet environment. It uses a minimum of moving parts, which have been manufactured from corrosion resistant materials. This ensures the reliability of the Techjet machines for many years after their installation.

With their extensive knowledge of waterjet cutting, the team at AMC Jets and Techni Waterjet are able to provide

solutions to suit every application and budget and are extremely excited to be able to present this technology to their ever-growing customer base across the UK and Ireland.

From the fully bespoke Intec and Techjet series systems, to the award winning, energy efficient, easy-to-maintain, virtually silent, Quantum NXT Electric Servo Pumps, AMC Jets are now able to offer the full and complete waterjet package.

It confidently believes that the latest, state-of-the-art Techni Waterjet systems represent a huge step forward for the waterjet cutting industry in terms of performance and reliability.

One of the most recent additions to the Techni Waterjet portfolio, is the release of the latest 4th generation of Quantum NXT Electric Servo Pump (ESP), brand new for 2018.

Dennis Schmidt of TECHNI Waterjet Europe states: "The newest generation is designed to avoid surprises. It warns operators about changing operating conditions before it actually stops with an alarm. Through the analysing of historical data, we will be able to move to predictive analytics and inform operators about probabilities and timing for future maintenance needs. One day, I hope, we can use prescriptive analytics to also provide methods of improving the pump setup to extend the service intervals and/or completely avoid the pump to come to an unexpected halt."

Tom Shore of AMC Jets, comments: "AMC Jets is excited to be working alongside TECHNI Waterjet, a company that



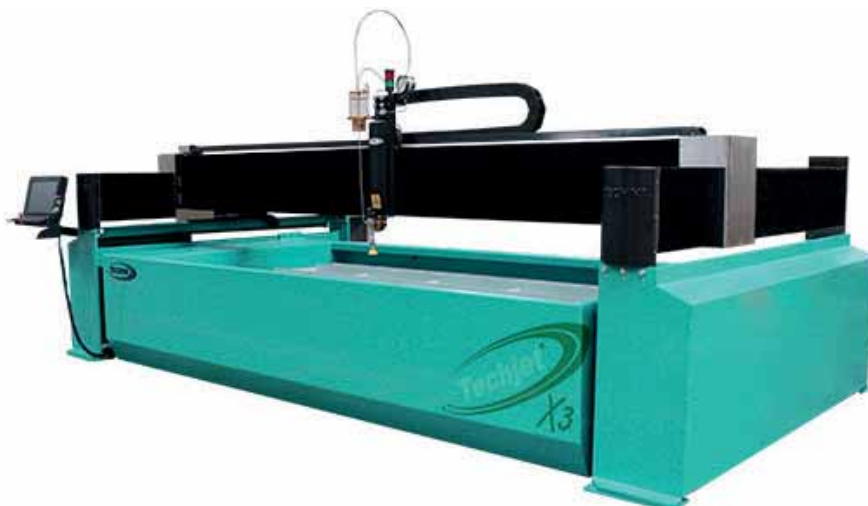
shares the same core values in customer service and product innovation as ourselves. We are thrilled to be installing the UK's first 'Gen4' Quantum NXT Electric Servo Pump sometime in mid-April, alongside a brand new Techjet 4100 4 m x 2 M machine, which includes a PAC60 5-axis cutting head as part of the customer's build specification."

"This particular customer has decided to upgrade from their existing 15-year old machine, which was powered by a hydraulically driven pump, to our Quantum ESP Pump to take advantages of higher efficiencies, energy savings, lower noise levels and minimal downtime for maintenance. A seal change on a Quantum ESP pump takes less than five minutes, designed with increased production time in mind.

"Every machine we sell, has been tailor-made specifically around the customer's requirements. As waterjet cutting can be a very diverse and flexible manufacturing process, machine needs can differ from client to client. For example, a machine designed for metal profiling, may not necessarily be suitable for a company who would want to utilise waterjet for cutting foams and rubbers."

For further information on the TECHNI Waterjet range, contact:

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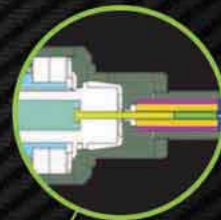
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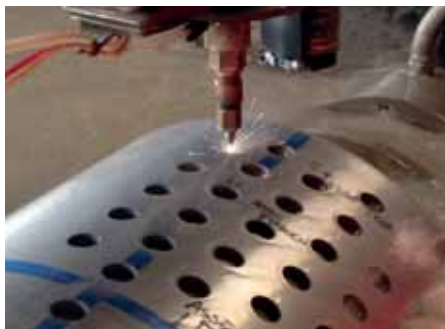
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Fast turnaround times

Nestled in the province of Vicenza at the base of the Italian Alps, CEAP Srl has been producing valves and switches for over 40 years. Working with cast iron, stainless steel, and bronze, CEAP manufactures knife gate valves, 30-degree gate valves, rhomboidal passage valves, and 3- & 4-way deviators. These products have uses in food, chemical, pharmaceutical, construction, petrochemical, and other applications. By providing customised products, as well as small batches of valves, CEAP sets itself apart from the competition and caps it all with superior service.

Opportunity came in 1996 when Ottorino Dani purchased CEAP. Ottorino's son Andrea managed CEAP and with this relationship came an association with TUBISTEEL, a company managed by Ottorino with over 30 years of experience in large pipe manufacturing. "Where there are pipes, there are valves," notes Andrea Dani. "Close cooperation with TUBISTEEL producing pipes that measure up to 3.5 metres in diameter and lengths of 25 metres meant that CEAP could serve the needs of TUBISTEEL in production of pipes and produce custom valves. For nearly twenty years, this relationship proved successful for CEAP, allowing the company to grow and build its reputation for quality valves and service.

By 2014, this growth meant that much of the complicated or precision cutting was outsourced. To lower costs and eliminate delays, CEAP decided to bring these cutting operations in-house. With plasma systems and CNC machines already in-house, the company already had processes in place for cutting applications. The plasma systems were not precise enough and the CNC machines, while precise, were slower for part production. CEAP initially considered adding a laser to boost their capabilities, but like the plasma, a laser creates heat affected



zones (HAZ) that would require secondary machining. The focus then shifted to abrasive waterjet, which is a cold cutting process with a smooth cut edge and is capable of 5-axis cutting.

With the abrasive waterjet process selected, CEAP then turned to finding the right machine for their production. The answer was the DualBridge OMAX 120X JetMachining Center equipped with an A-Jet and a Tilt-A-Jet cutting heads, a rotary axis and a 50 HP EnduroMAX pump. With the DualBridge, CEAP could cut two independent projects simultaneously on one machine, significantly improving productivity. The Tilt-A-Jet cutting head provides tight tolerances that CEAP uses for cutting valve components that are welded together without secondary operations, bringing in-house many parts that were previously outsourced. With the powerful combination of the multi-axis A-Jet cutting head and the rotary axis, CEAP is able to easily bevel-cut pipes for valve components or complex parts for any special tube that TUBISTEEL product, and scale that production for sizes ranging from 5 cm to 30 cm.

Like many manufacturers in the region, CEAP initially believed that abrasive waterjet technology was cost prohibitive for all but the largest of production environments. "We learned from ITEK, the OMAX distributor in Italy," says Andrea Dani, "that the acquisition and operational costs could provide a reasonable return on



investment." With their 120X churning out components in-house, CEAP is discovering just that, and while their initial goal was to support the production needs of TUBISTEEL, the company has expanded their business to serve local metal processing needs. With the easy-to-use OMAX Intelli-MAX software, simple and fast workpiece fixturing, and local applications support from ITEK, CEAP can maintain fast turnaround times, allowing them to deliver on their service promise to a broader audience.

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STM JET 4200.45 is the new all-rounder among high-pressure pumps

A waterjet cutting system is only as good as its high-pressure pump. STM has therefore now developed a high-pressure pump that plays all parts. The focus hereby was on performance, energy efficiency and minimum pressure fluctuations.

The basic idea of STM, to adjust waterjet cutting systems to the needs of customers organically and modular in order to thus cut even more economically and efficiently, is also demonstrated by the latest development of the waterjet cutting systems manufacturer. The newly developed STM JET high-pressure pump 4200.45, with a maximum operating pressure of 4,000 bar and a feed rate of 4.6 l/min, convinces with more power, less wear and high energy efficiency. Special attention was paid to consistent pressure for top cutting quality. An upgrade in terms of functionality is provided by the optional PressureSaver® pressure reduction unit for customised high-speed pressure adjustment for all individual connections.

More cutting capacity with less energy consumption

With a power of 45 kW for 0.40 mm water nozzles, the new pump provides up to 35 percent more cutting capacity, compared to 37 kW, thanks to the XL pressure intensifier. The longer stroke ensures 20 percent less double strokes and thus longer service lives for seals and check valves with the same cutting capacity. That protects the entire high-pressure system.

The subject of energy efficiency is pertinent not only for investment grants. Because of the frequency-inverter-actuated asynchronous motor, the STM JET 4200.45 requires 20 percent less current for regular operation and is thus clearly more economical than comparable units. A lower holding current with closed cutting valve and only 1.5 times the start-up current round out the energy efficiency package.

Higher cutting speed through low pressure fluctuations

The actual current display ensures consistent pressure control. Stepless pressure adjustment is possible from the STM SmartCut waterjet cutting software.



Pressure fluctuations are only 50 bar or 1.25 percent which not only protects high-pressure components but also increases the cutting speed by 10 percent. By way of comparison, with conventional pumps, the pressure fluctuates about 120 bar or three percent.

In terms of functionality, the STM JET high-pressure pump offers a few highlights. Low pressure and high litre capacity enable surface abrasion and engraving. The pump is also suitable for suspension jet cutting. The standard package already contains a booster pump, an automatic-stop valve, one oil filling, special tools and a spare parts package. For professional users, there is also an optional PressureSaver pressure reduction unit. This individual high-speed pressure adjustment enables immediate switches from low to high pressure after every piercing.

STM is a leading provider of waterjet cutting systems with its head office in Eben, Austria and Schweinfurt, Germany. For more than 25 years, the traditional company has developed future-proof production solutions, mainly for the steel, aluminium, metal, plastic, stone and glass industries, which are most notable for their efficiency, ease of use and resistance to wear. Alongside future-proof technology and quality as standard, STM places great

emphasis on innovative full service. In so doing, the brand manufacturer ensures that its individual manufacturing processes are continually matched to the latest requirements of its customers.

Each STM portal system is available with different bridge widths and table lengths and is equally well suited to both abrasive and pure-water cutting. Consequently, STM systems can be used to cut a wide range of materials without retooling costs - irrespective of whether 2D, 3D, pipe or robot cutting are required. Thanks to fully compatible modules, all machines are completely upgradable and can be precisely configured for specific application profiles.

STM Waterjet Germany, formerly Maximator JET, has been the development and sales location in Germany since 1999. The company focuses on developing and realising highly specialised waterjet cutting systems for all kinds of special applications here. The company STM stands for pioneering production solutions and unlimited individualisation options.

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Abrasive vs pure water cutting

What is the difference between abrasive and pure waterjet cutting?

Abrasive waterjet cutting uses an abrasive particle, for example garnet, added to high pressure water to cut through hard materials. The abrasive particle is added to the water in the nozzle of a waterjet cutting machine. In this operation, it is the abrasive particle that does the work of cutting the material. The role of the water is to accelerate the abrasive particle up to a speed suitable for cutting and to direct the particles to the chosen cutting point.

Cutting effectiveness can be improved by increasing the water pressure, thus accelerating the water and particles to a higher speed, or by increasing the flow rate of water and particles, thus increasing the rate of impact of particles on the material.

Abrasive waterjet cutting is ideal for harder or thicker materials like metals, stones, or thick plastics.

Pure waterjet cutting is a term used to describe the process of waterjet cutting without the addition of abrasive particles. In this case, it is the pressure and speed of the

water itself which penetrates the material. Pure waterjet cutting is ideal for softer materials like fabrics, rubber, or metal foils. One key application for pure waterjet cutting is in the processing of food where strict health regulations governing the industry can be met by using pure water without abrasive additives.

A subcontractor's success is dependent on the speed of response to customers' needs and the quality of workmanship that keeps them coming back. Waterjet cutting is a perfect fit to meet these objectives. A typical scenario may be a call from a customer whose production facility is offline due to a gasket failure. The 5-minute turnaround using a waterjet cutting machine is far superior to the 1-hour plus required using punches and dies.

Resato B.V was formed in 1991 as a result of a management buyout. The company moved into waterjet technology in 1999 and



experience in delivering high pressure pumps for waterjet units resulted in the decision to develop and manufacture optimised waterjet cutting solutions from the core, the pump, over the table to the cutting head, abrasive management systems, and software. Today Resato's waterjet solutions are powered by best-in class high pressure components.

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Redefining full 3D abrasive waterjet cutting

High precision abrasive water jet cutting has been an area Water Jet Sweden has excelled in for decades. Since its international breakthrough in 1999, winning a prestigious order from Daimler Chrysler Aerospace, Water Jet Sweden has been serving high tech industries from defence, medical services and aerospace all across the world.

Water Jet Sweden's FiveX solution is the premium model in the portfolio. With a Z-movement of 750-1500 mm and a $\pm 0-91^\circ$ cutting angle it is specifically designed to manage high precision 3D abrasive cutting.

When cutting in 3D, safety is of paramount importance. WJS's FiveX machine is designed with full size walls and automated front and back protection to ensure constant production in a busy environment.

The latest customer challenge was to cut cone shaped holes on a vertical surface, as Tony Ryd, technical director at Water Jet Sweden, explains: "The machine specification has a maximum cutting angle of $\pm 91^\circ$ which wouldn't be enough, so we were forced to redefine machine specification and introduce a new cutting head with $\pm 0-120^\circ$ cutting angle. After a thorough evaluation of component suppliers, we finally found a solution that met our long life and high-performance standards."

Despite the FiveX model being a highly complex machine system, WJS's PanelOne HMI control makes it smooth and easy to operate. PanelOne has touchscreen functionality and a simple joystick movement which requires just a few days of training for the operator to master.

Another unique feature on the latest machine project is a new cost-efficient sensor function, fully integrated in the PanelOne HMI. Tony Ryd says: "When started, the safety lid opens, and it automatically identifies the 3D workpiece placement and sets the zero point. Then, without halting, the program goes directly into cutting mode. It's a very clever feature."

WJS machines are also powered by top of the line Ultra High-Pressure Pumps from the leading OEM suppliers in the USA and Europe. They safely deliver consistent ultra-high-pressure water and the digitally controlled abrasive feeders, mounted on the machine, secure the cutting process.



WJS has a premium reputation for the robust and stable machine design. Linear drives on the X-beam and ballscrews on the X-axis repeatedly perform high precision free form cutting with a repetition accuracy of less than ± 0.025 mm. WJS's unique world patented gantry machine design enables the same cutting accuracy, irrespective of the required machine table size, meaning a 2 m machine is as accurate as a 6 m machine. The FiveX model is designed for both 4,100 bar and 6,200 bar cutting pressures, which makes it unique compared to other products in the market.

Tony Ryd is proud of the company's reputation for reliability. "Customers expect consistent performance, so we offer a 5-year performance warranty proving the quality of the machine design, parts and components used on this FiveX machine model as well as all others. We guarantee that all our machines keep the same tolerance level after five years as the day when the machine was first delivered."

Another machine is ready for a long life of performance and productivity, built with decades of experience and Scandinavian craftsmanship by people who care about productivity. To coin a phrase from another global Swedish manufacturer, 'Human Made.'

Water Jet Sweden designs, develops and manufactures advanced solutions for water jet cutting and is a leading manufacturer of precision 2D and 3D water jet cutting machines.



Waterjet cutting is a non-thermal cutting method using only natural sand and water to cut almost any material. In theory a simple process but in practice an advanced cutting technology. The brittle cutting process give a smooth cutting surface with no slag or heat affected zones, and there is less need for post processing.

All materials can be cut by the one and same water jet machine, from soft rubber and plastics to the hardest metals and ceramics. A CNC operated water jet machine ensures identical parts independent of volumes and with a minimum of waste material. The versatility and ease of operation makes water jet technology compare to no other machine tool process in the market.

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Waterjet innovation leads the way

For over 27 years, Waterjet Corporation has been developing and manufacturing a wide range of CNC multi-axis waterjet cutting systems, including standard models in various sizes as well as customised machines; a history marked by a steady development and a continuous effort towards total quality and technological research; a passion that has allowed the company to expand its presence at international level, thanks to a well-established sales network consisting of direct subsidiaries as well as local importers and distributors.

Waterjet Corporation's headquarters are in Monza, Italy, with regional branches located in the US (WaterJet USA LLC, Chicago, IL) and in the United Arab Emirates (Waterjet Middle East FZCO, Dubai).

Waterjet technology is mainly applied for the processing of metal, stone, glass, plastics and composite materials. It doesn't require subsequent process on the cutted piece. As a cold cut, it doesn't produce any mechanical nor thermal deformation, has no limits in thickness and has a simple functionality, thanks to the usage of the same tool, i.e. abrasive sand pushed by the water jet at 4,000/6,000 bar pressure, with the same conditions for most materials.

At Mescpe, Palma and MACH for example, it exhibited the compact model CLASSICA CL44. This is a machine characterised by a bridge system, equipped with a 3-axis machining centre with an integrated stainless-steel tank with a thickness of 8 mm. The movements of the axes are obtained by rack & pinion motion system, ball screw motion system and linear guideways with preloaded bearings. The transmission has an automatic lubrication system.

The company's machines are guaranteed a very high standard of processing precision and reliability and are highly customisable according to the specific needs of the customer. Waterjet machines can be equipped with the following highly innovative integrated systems: supersonic waterjet cutting 4 Mach EDGE 5™ with five interpolating axes and integrated ITC™ function (Intelligent Taper Control); the high-definition hybrid Plasma-Waterjet cutting system with combined waterjet and plasma cutting systems up to 260 AMP Hypertherm; the HYDROFINISH System, an

innovative device which is able to texture and decorate the surface of all types of material with high pressure water only so, it's also an environmentally friendly technology.

Waterjet Corporation's own research and development centre tests all the new technologies before distributing them on the market. The quality control complies with the ISO 9001-2008 procedures and guarantees the CE conformity of all the components produced and the machine.

The Waterjet offer is complemented by an after-sales service guaranteed by a team of highly specialised technicians. Service activities that accompany the life cycle of a machine supplied by the company are as follows: technical assistance during and out of warranty; tele-online assistance; supply of original spare parts and consumable products; installation and training on the use of the machine; CNC and software updates; periodic maintenance contracts.

A series of important milestones have marked the company's activity. It was awarded as best in Brianza in the Internationalisation category during the gala evening of the BTOB AWARDS 2016. In January 2018 it received, for the 9th



consecutive year, the recognition as the best original manufacturer of water cutting machinery with KMT pumps, its American partner. The international style of the company is also dictated by a modern marketing strategy. In addition to the new website you can also find it on the main social networks (Twitter, LinkedIn, Facebook, Google Plus and Pinterest) where news, events, videos are posted and where you can find illustrated the wide range of its waterjet cutting machines.

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Automate to accumulate with AMADA press brakes

While many assume press brakes to be mature technology, AMADA continues to push the boundaries of what can be achieved with this core metal-forming process. As a result of recent developments, the company can offer a number of important automation advancements that are designed to deskill and reduce costs for fabrication shops everywhere.

Among the integral automation technologies is FAST (Finger with Active Safety Technology), an innovative addition to the machine's back gauge. FAST offers the capability to increase the speed of machine movement in a safe and controlled manner. The result is that lost time between bends, the time spent by the operator in waiting for back-gauge positioning, is reduced to a minimum, so increasing productivity to its maximum. The technology can be fitted to AMADA HFE-3i and HG series press brakes.

A further integral technology able to advance productivity is AMADA's innovative ATC (Automatic Tool Changer). The HG-ATC is the company's flagship press brake and is unique in the marketplace. ATC technology facilitates the automatic locating and precise loading of punch and die profiles using an independent 4-axis tool manipulator, delivering dramatic time gains. In fact, using a clever algorithm to guarantee the best setup time means the HG-ATC can load even the most complex tool layout within just three minutes.

HG-ATC press brakes can also be equipped with AMADA SF75 sheet followers. These handy devices, which fit to the front of the machine, make it easier to handle large, heavy parts, which perhaps would have previously required two operators.

Of course, most people associate automation with robotics, and here AMADA's latest offering is the HG-ARs. This robotised bending cell, which is equipped with the new AC-300 automatic pallet changer and ATC, perfectly illustrates all the productivity and flexibility gains that can be achieved using the latest automation technology. Material load/unload and bending functions are performed by a 7-axis articulated robot, which is capable of a



complete range of motions. A 7-axis robot also features in AMADA's HG-Rm press brake system for bending large-scale parts featuring complex rib and panel shapes.

From a software perspective, AMADA can offer its advanced VPSS 3i suite for the provision of streamlined workflow from initial 3D CAD model to finished product, taking in processes such as cutting, punching, bending and welding. The key to the success of the VPSS 3i system is the constant data link between the separate software modules, such as Blank CAM, Bend CAM and Weld CAM, the machines and the central database. This database stores all parts, machines, tools, materials and technology-related information in a consistent way, distributing the data quickly and reliably. All of AMADA's automation solutions incorporate the latest digital technologies in line with smart factory and Industry 4.0 concepts.

AMADA's automation product portfolio is supported by the company's Robot Technical Centre (RTC), a hub of excellence for robotics located in Italy.

HFE-5012M2 press brake

Based on decades of experience in bending sheetmetal parts and the proven reliability of its HFE-M2 range, AMADA has unveiled its new compact press brake. The HFE-5012M2 is designed with user ergonomics and high productivity in mind.

The new HFE-5012M2 has been developed to offer the fast and comfortable

bending of small parts with medium complexity. The machine provides 50 tonnes of bending force and a working width of 1,270 mm.

Thanks to the performance of the upper beam combined with the velocity and flexibility of the new back gauge, high efficiency is a primary attribute of the HFE-5012M2. The open height of the frame has been increased, resulting in an optimised solution for all tooling types, and allowing for deeper box bending. Furthermore, the new, narrower lower beam increases process flexibility and combines ergonomics with crowning precision, while the back gauge with active security provides both better productivity and safety with its high-speed motion yet low-impact force.

The HFE-5012M2 has been equipped with several features designed specifically to support the comfort of the operator, including: a reclining and adjustable table; an ergonomic chair with adjustable height and backrest inclination; a retractable foot rest; six drawers equipped with tooling and inserts; a workplace lighting kit.

AMADA UK

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LVD announces major order for new Synchro-form press brake

LVD Company nv has been awarded an order from Japanese technology company, Kawasaki Heavy Industries (KHI), via its sales agent ITOCHU MACHINE-TECHNOS CORPORATION, for its unique Synchro-Form adaptive bending technology for large-profile bending. Synchro-Form was named the most innovative new metal forming product at EuroBLECH, the world's largest sheet metalworking technology exhibition.

The Kawasaki Heavy Industries (KHI) order is for a custom-built, 1,000 tonne class Synchro-Form press brake equipped with special tooling to produce large panels for the fuselages of commercial aircraft. Forming such XXL parts to a desired contour is a challenging task and one that will be significantly simplified with Synchro-Form, which maintains angular consistency and the required geometric profile. It also enables an in-process automatic quality control when handling, positioning and bending large parts with multiple bends.

Kawasaki Heavy Industries (KHI) in Japan is a key production partner for the production of the Boeing 777X, the successor to Boeing's popular 777 aircraft. The 777X will be the largest and most efficient twin-engine jet in the world, unmatched in every aspect of performance.

LVD's Synchro-Form press brake meets the tight tolerance requirements demanded of the Kawasaki Heavy Industries (KHI) application and the need for complete automation. The order was awarded to LVD after several bending trials and strict accuracy measurements were satisfied.

The Synchro-Form press brake will be manufactured at LVD's world-class production facility at its headquarters in Belgium.

Synchro-Form is the next generation of adaptive bending, a unique system that is designed to make bending large profiles easy, efficient and consistently accurate. The Synchro-Form system evolves LVD's renowned adaptive bending technology to automatically maintain angular consistency and the required geometric profile when bending large parts. Synchro-Form eliminates manual operations, reduces setup and handling, and ensures consistent



bending results, delivering high throughput for XXL bending.

The Synchro-Form system uses synchro modules with an X-, R-, A-axis, a magnet to manipulate the parts and a laser scanner to measure the angles. The digital information is relayed to the LVD TOUCH-B control, which makes adjustments to part and ram position to achieve the correct profile. Variations are not accumulated but are compensated for in subsequent bend steps. Even after multiple consecutive bends, the profile is perfectly formed.

LVD's Synchro-Form system is an integrated feature of Synchro-Form Series in models ranging from 320 tonnes by 4 m up to 3,000 tonnes by 14 m and is also available in tandem, tridem and quadem configurations.

LVD is a leading manufacturer of sheet metal plate working equipment, including laser cutting systems, punch presses, press brakes, guillotine shears and mid-level automation systems, integrated to and supported by its CADMAN® software suite. LVD Industry 4.0-ready products and technology make smart manufacturing possible. LVD is active in 45 countries worldwide with production sites in Belgium, USA, Slovakia and China.

LVD is named after its founding fathers, Jacques Lefebvre, Marc Vanneste and Robert Dewulf. Established in the 1950s, LVD gained recognition as a precision press

brake manufacturer. Significant growth in the 1990s, which included the acquisition of Stripit, Inc. in 1998, a US-based manufacturer of turret punch press equipment and the addition of laser cutting products to its portfolio helped position the company as a leader in laser, punching and bending technology.

Kawasaki Heavy Industries (KHI) engages in the manufacture of transportation equipment and industrial goods. It operates through ship and offshore products, environmental control and energy plant engineering, machinery and robotics, rolling stock including Shinkansen and New York subway cars, leisure products, such as the worldwide known Kawasaki motorcycles, and others. The aerospace division is active in products ranging from aircraft to satellites. KHI is a long-time partner in the international joint development and production programs in commercial aviation. Jointly, with US-based Boeing, the group manufactures and develops components for the Boeing 767, 777, 787 and now 777X. KHI has more than 35,000 employees spread over about 100 group companies in Japan and worldwide.

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Tube processing on a flat-bed fibre laser cutting machine

Sheet metal working equipment manufacturer Bystronic has introduced a new rotary axis for processing tube on its ByStar Fiber flat-bed laser cutting machine, which offers up to 10 kW of fibre laser power. The new equipment enables users to switch between sheet and tube processing in a few simple steps.

The factory-fitted rotary axis, together with a retractable tailstock, enables tubes from 30 mm to 315 mm in diameter and in a variety of lengths to be machined. The operator inserts the tube either from the outside through a hatch in the ByStar Fiber's housing or directly into the machining area through the sliding door along the side. Unloading of cut parts is similarly rapid.

Also on offer is a Tube Cutting software module, which is an expansion to the proprietary BySoft 7 programming software. It allows users to design parts for tube processing, input existing CAD files, edit them and generate cutting plans.

To support fast setup times for processing a variety of tube profiles, Bystronic has integrated an assistant function into its ByVision Cutting user interface. This guides the user through every operating step via the ByStar Fiber's touch screen.

For manipulating longer tubes, Bystronic offers a rotary axis box, akin to a bar magazine on a lathe. The detachable accessory is mounted on wheels and enables tubes up to 3 metres long to be fed in through the hatch in the machine housing and positioned accurately. With an additional extension box, tubes up to six metres in length can be processed.

An informative video showing tube cutting on a ByStar Fiber can be viewed at: www.youtube.com/watch?v=9G3-IMSc4pY&feature=youtu.be



For processing longer tubes, Bystronic offers a mobile rotary axis box for the ByStar Fiber



An integrated rotary axis on the Bystronic ByStar Fiber and a setup assistant facilitate rapid transition between sheet and tube cutting

BySmart Fiber: now with automation

Bystronic has expanded the BySmart Fiber laser cutting system with suitable automation solutions. Customers now have the choice between the ByTrans and the Byloader.

Automation solutions for fibre laser cutting offer a decisive competitive advantage. They maximise the capacity utilisation of the laser cutting system and reduce the user's workload with regard to the time-consuming material handling. Both these factors mean that cutting jobs are performed faster and at lower cost.



The latest generation of the BySmart Fiber is ready to connect to automation solutions

Bystronic is now opening up the new generation of the BySmart Fiber for appropriate automation solutions as, even for entry-level users, automated laser cutting is increasingly becoming the key criterion for success.

"Our experience shows that particularly in highly competitive markets, companies that automate their laser cutting system have a competitive edge. Hence, Bystronic is now also offering various automation modules for the BySmart Fiber," explains Bystronic product manager Martin Bauer.

Customers have the choice between two systems: ByTrans and Byloader. The ByTrans loading and unloading solution organises the material flow on the BySmart Fiber fully automatically. It loads raw metal sheets onto the laser cutting system's shuttle table. After the cutting process, the ByTrans also unloads the finished parts and residual sheets. ByTrans requires only 60 seconds for the complete loading and unloading cycle. This means that the automation system is always faster than the cutting plan that is being processed. For users, this means: laser cutting without the interrupting setup times. Because the ByTrans loads one shuttle table while the BySmart Fiber is cutting on the other table.

The Byloader automation system is a compact loading unit that is positioned on the side of the laser cutting system's shuttle table. The system supplies raw metal sheets to the laser cutting system without taking up unnecessary space. This is automation on the minimum amount of space.

The ByTrans and Byloader are operated using the BySmart Fiber's touch screen. Bystronic has seamlessly integrated the

control of the two automation systems into the laser cutting system's operating software. This enables users to perform all the operating steps on a single touch screen.

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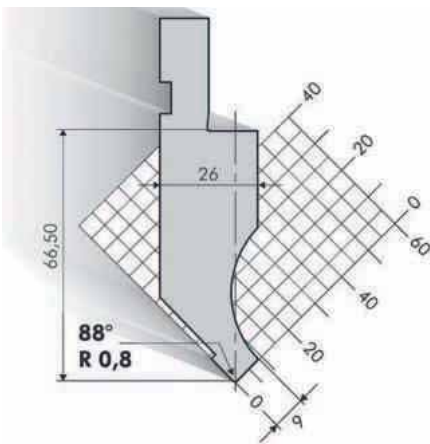
Ensuring the right press brake tooling for your machine

TTL Tooling Systems is one of the few manufacturers of press brake tools in the UK that are able to offer a full design and manufacturing service to anyone using a press brake, no matter what make of machine is being used.

While special purpose tooling can be designed in the company's hi-tech facility, it also offers a wide range of standard tools that are suitable for all makes of press brake. To eliminate marking of aluminium, stainless steel and pre-coated steels during bending, TTL can provide several solutions: Mark Less tooling and Mark Less bottom tools.

Euro style tooling

All tooling is hardened and ground from 42CRM04 steel in 835, 415 and 835 sections. Ex-stock delivery is possible on most items, with others in 7-10 days. Tooling is available to fit all types of press brakes, including Amada, Adira, Guifil, KB, Edwards Pearson, Kingsland, LVD, Promecam, Safan and Durmazlar. TTL Tooling supplies a comprehensive range of press brake tools for all machines using standard Euro fixings. Popular press brakes that use Eurospec tools are given below. If you are not sure if your machine uses these specific tools, TTL to discuss your tooling needs.



Bending without marking

Mark-Less has been developed for the precision sheet metal manufacturing industry.

Mark-less tooling film is manufactured to prevent marking and scratching of aluminium, stainless steel and pre-painted materials during bending.

When "MARK-LESS" is used between the bottom bending tools and the material, bending marks are eliminated;




sanding or polishing is eliminated; dies are protected; production cost decrease; use with present tooling setup; no new tooling required.

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B3

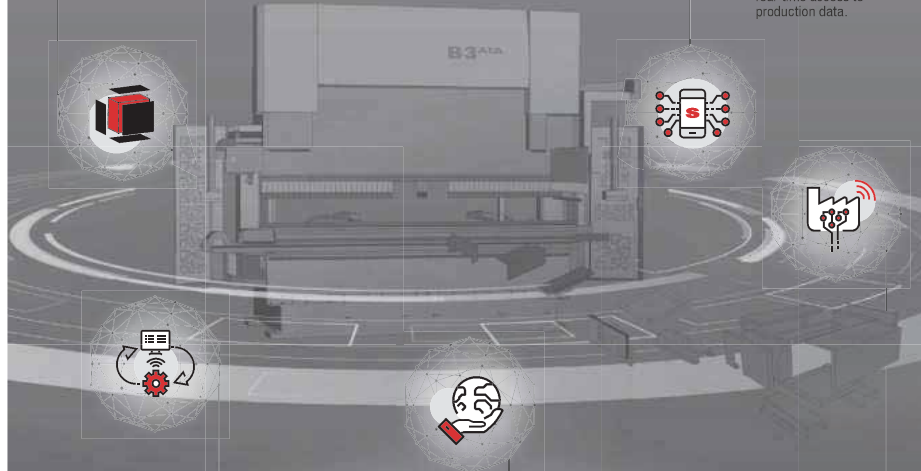
Kinetic press brake

Kit-able
Unique solutions (AIA and MVM) guarantee productivity and flexibility for batch one or kit production.




Ready for the digital factory
IoT Links monitors system performance and allows real-time access to production data.







MAC 2.0
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4.0 ready
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KinEtic
Direct drive, KERS, LSB are designed to respect the man and the environment by keeping high productivity.



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B3 is designed to manufacture without restrictions, flexibly, from the idea through to the final product, with maximum safety, easily and efficiently. All 14 models available, from 2 to 5 metres and from 60 to 400 tons and are designed and manufactured in Italy in a brand new and modern plant, Salvagnini Robotica, entirely dedicated to pressbraking technology.



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Expanded range of options and features

Following the opening of the new dedicated Salvagnini Robotic Press Brake factory last year, the company has expanded the range of options and features on its B3 machine. The B3 is a native 4.0 hybrid press brake, fully connectible with the production system in which it works, while also offering the possibility to be monitored remotely.

It can now be equipped with upper and lower automatic tool adjustment devices and MAC 2.0 technology that make it unique, adaptive and completely autonomous, from the viewpoint of excellent process efficiency and aligned to the Salvagnini Industry 4.0 concept.

Borrowed from the ABA principle of Salvagnini panel benders, ATA, the patented device for the automatic setup of upper and lower tools, automatically adjusts the length of the tool in approximately five seconds, allowing for kit production even in press brake. Eliminating the requirement for manual retooling of the Press.

Batch one production is guaranteed by the MAC 2.0 adaptive technology, again also present on Salvagnini panel benders.

This allows the B3 to produce accurate bend angles on any material of any thickness without the intervention of the operator.

The most recent innovations of MAC 2.0 contribute to the extraordinary precision performance and repeatability that include the new compact AMS angle measuring system, that uses an optic laser system to take exact measurements and guarantees the extraordinary angular precision. The SCrowning system regulates and compensates in real time the lower beam crowning value of the press brake, based on the actual behavior of the material. So, while SCrowning keeps the angle constant for the entire length of the bend, AMS, measures just one point, bringing the bend to the right angle. Thanks to the new TFC (Total Frame Control) the closed-circuit control of the deflections of the machine structure, the consistency of the bend is autonomously guaranteed, even with a change in the length and/or resistance of the material. All this without the intervention of an operator.

The latest B3 is equipped with the brand-new HMI interface control, following



results of in-depth customer experience analysis, for an intuitive, easy and immediate management of the machine and production. The range has been expanded and is now available from 60 to 400 tonnes, with bending lengths from 2 m up to 5.1 m.

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The advantages of electric press brakes

Folding is an essential operation that conditions the workflow in a sheet metal workshop. The challenges are numerous: productivity, precision of folded parts, safety of the operator, etc. Almost all sheet metal plants use press bending machines at this production post. Two main technologies are proposed by manufacturers: machines with hydraulic drive and those with electric drive by servomotors.

The main advantage of hydraulic press brakes is that they offer very large folding capacities. On the other hand, despite the higher purchase cost of electric press brakes, the use of servomotors instead of hydraulic cylinders brings productivity, energy, flexibility and maintenance gains. Also, the capacity of electric press brakes can be of up to 4 m of folding and a force of 300 tonnes.

With electric press brakes, operating time is reduced to 40 percent. On average, 60 percent of the operating time of a hydraulic press brake is used for adjustment and maintenance operations: programming, changing of tools, handling of parts to be

bent, oil change, etc. The productivity of the equipment is strongly impacted, as the hydraulic system works continuously even when the machine does not bend. This results in considerable and unnecessary electricity consumption, for example oil to heat, machine idle, etc.

Energy consumption is very low on an electric press brake, as the servomotors consume energy only during its operation.

Bending is a deformation of the slider which is observed on all machines with hydraulic drives. Most manufacturers of hydraulic press brakes offer mechanical or hydraulic "de-bending" systems. Solutions are available to compensate for this phenomenon by a reverse force in the worktable. The adjustment is manual or automatic, according theoretical bending rules.

The manufacturer that invests in a press brake determines the capacity of the machine according to the largest part to bend and the thickest material to be bent. However, on a hydraulic press brake, energy consumption will be similar from one piece



to another. On an electric press brake, servomotors consume only the energy required to bend the workpiece.

SafanDarley has integrated in its machines a security system that requires no adjustment or use of a pedal. The descent of the slider can even be done in high speed up to 1 mm of the sheet. It is therefore a security system that increases productivity instead of decreasing.

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Clamping solutions breathe new life into your existing press brake

Like any tool used in fabrication, your press brake's bending surface gets scratched, dinged and uneven with time and use. According to leading press brake tooling provider Wilson Tool, one way to return the brake to its former glory is to pay upwards of £8,500 to get the beams reground. Why not upgrade it with the latest technology?

Express Rail

Express Rail provides lightning-speed clamping. Its power source is hydraulic and it clamps and seats simultaneously. It could give you more height in your break and a renewed working surface. It is the ideal solution for customers that do a lot of tool changes and/or the upper and lower beams could use a new working surface. Suitable for all press brake machines and is compatible with Willa/Trumpf Style and American Style tooling with a grooved tang.

Express Air

Express Air offers flexible and fast setups with a clean, low cost power source. It is powered by standard shop air that is

engaged by a flipped switch. It features sectionalised front and back clamping for flexible bending. It is the solution for customers that do numerous setups and require versatility in the use of a punch holder for box bending and clamp plate removal for clearance. Suitable for European Z1 and Z2 machine types as well as American and is compatible with European tooling.

Express Crowning

Express Crowning can calibrate the perfect "crown" to control deflection and it bends parts straight consistently without having to tinker. For power there is the choice of manual set screw or hydraulic die holding; manual crank or electric crowning. It offers macro and micro adjustment to get the perfect crown. If you bend parts over 4' that end up with a bowed appearance unless you shim the beam to counteract deflection, it is ideal. Suitable for all types of press brake machines and compatible with Willa/Trumpf or American tooling.



Express Clamps

The fastest muscle-powered clamping system available. It is powered by manual push lever and features front and rear clamping with easy removal. It is ideal if you want to substantially speed setups but you're not ready to make the leap to a machine-powered option. Incredibly efficient without using hydraulics. Suitable for American, Trumpf, European Z1 and Z2 machines and is compatible with European tooling.

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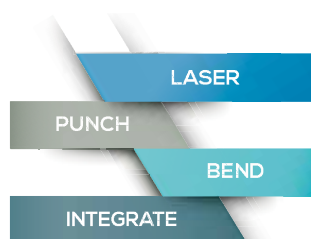
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Steel stockholder speeds deliveries with new circular sawing machine

In November 2017, the UK's largest independent steel stockholder, Barrett Steel Group, installed a KASTOvariospeed C15 automatic circular sawing machine alongside two bandsaws at its engineering division in Maghaberry, Northern Ireland. It has increased sawing productivity, reduced delivery lead-times significantly, improved accuracy and lowered cost per cut.

Acquired in 2013, the 5-acre site with 30,000 sq ft warehouse stocks an extensive range of engineering steels including bright bar in various grades and dimensions. The site, which is also home to Barrett Ireland Processing and Barrett Steel Tubes, sells a variety of long products, hot and cold hollow section as well as plate to diverse industries such as construction, energy, agriculture, manufacturing, general and civil engineering, rail and yellow goods.

Gary Sloan, operations manager for the Barrett Steel Ireland site, says: "Circular sawing is many times faster than using our bandsaws. Since the C15 arrived, we have been able to reduce our turnaround time for smaller billets from between four and five days down to one or two. It is helping us to keep our loyal customers happy and win new business as well.

"The other big advantage of the German-built machine, supplied through KASTO's UK subsidiary in Milton Keynes, is that a significant amount of material is saved.

"The higher accuracy of the circular saw allows us to reduce our cutting tolerance to between +0.1 and 1.0 mm, minus 0 mm, whereas our bandsaws have historically been programmed at +1.0 to 2.0 mm, minus 0 mm.

"Electronic blade deviation monitoring allows us to set the closer tolerance while providing assurance that there will be no scrap, which would eat into profits."

Since the circular saw was installed, Barrett Engineering Steel Ireland customers have reported that apart from receiving material a lot faster, the finish of the cut ends is of a much better quality than when the material is bandsawn. The C15 uses a mist lubrication system, so material is delivered to customers in a noticeably cleaner condition due to the absence of



bandsaw swarf mixed with coolant on the surface of the cut pieces.

The machine at Maghaberry has a 12-position, chain-type infeed magazine separated by divider pins and a six-bin outfeed system with automatic cut piece sorting. The configuration allows minimal operator attendance during the day and lights-out running at the end of each shift, which according to the type of job can mean the machine runs for a few extra hours or right through the night.

Gary Sloan advises that overall, output is increased by 150 to 200 percent due to the high level of automation and the extra cutting time available on the two bandsaws. Moreover, a lower level of operator attendance translates into more cost-effective cutting of all grades of steel into billets from 8 mm to 2 m long from stock ranging in diameter from 10 mm up to 155 mm.

The C15 is fitted with Kasto's proprietary, top-end CNC system, ExpertControl, which not only oversees cut piece sorting but also has a multiple order programming capability to speed the fulfilment of customer orders.

Gary Sloan concludes: "The KASTOvariospeed is the best automated circular sawing centre available on the market today. It is transforming our business, allowing us to compete more

effectively on price and to deliver a better-quality product. It is so efficient at cutting material that we have also invested in a new, 260-location cantilever racking system specifically to feed the machine efficiently."

KASTO Ltd is a wholly-owned daughter company for KASTO Maschinenbau, Germany, a leading manufacturer of metalcutting bandsaws, circular saws and hacksaws as well as computer-controlled storage and retrieval systems for bar, tube, sheet and other materials. The subsidiary sells and services these products in the UK and Irish markets.

It is an autonomous business unit that plans and designs production and storage systems for factories and warehouses. The company is also responsible for project management, installation, commissioning, training, service and support, calling on assistance from the German parent company when needed.

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Esprit partners with Hypertherm at MACH

Esprit Automation, a leading manufacturer of CNC plasma cutting machines, was once again present at last month's MACH exhibition. The company has been attending this bi-annual event since 1992 and is a familiar face to returning guests. Esprit was eager to demonstrate how it has pushed the envelope on cutting machine technology on its stand.

This year Esprit showcased its flagship plasma cutting machine, the Lightning HD. Alongside this, visitors to the show found the XPR300®, which represents Hypertherm's greatest step forward in plasma cutting technology ever. Hypertherm's new class of plasma called X-Definition™ provides leading cut quality and superior performance on all metals as a result of new technologies such as Vented Water Injection™ (VWI), plasma dampening, and Vent-to-Shield technologies being incorporated. The end result is squarer cut edges, markedly less angularity, and excellent surface finish on non-ferrous metals like aluminum and stainless steel. When combined, the Lightning HD and

XPR300 create the reference standard for high-precision plasma cutting. Customers have reported that components cut on the Lightning HD machine with Hypertherm technology are comparable with laser cut parts.

Esprit also launched its latest innovation at MACH in the form of a digital dashboard that provides an insight into real-time operations, providing improved performance, reliability, and uptime; all of which are key factors in a cutting machine's real-life usability.

Esprit Automation's James Perrin says: "The launch of a digital dashboard for plasma cutting machines pulls the industry into 2018. While the technology has leapt forwards year-on-year, system management software has needed to catch up for some time. We are confident that visitors will be impressed with the possibilities of our digital dashboard."

Esprit produces a range of advanced plasma cutting solutions for customers covering a wide range of industries



throughout the world. It has manufactured in Nottingham, England since 1986. Esprit Automation and Hypertherm's partnership goes back nearly three decades. In 1990, Esprit chose Hypertherm as its exclusive supplier of plasma cutting technology, allowing both companies to specialise its hardware in order to complement the other.

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Holiday-home chassis specialist installs four TRUMPF machines

Bankside Patterson, the UK manufacturer of chassis for park homes and holiday homes, has installed a four-machine package from TRUMPF as part of a major upgrade process at its headquarters near Driffield, East Yorkshire. The machines include the company's first laser cutting machine, a TruLaser 3060 fiber, which has replaced plasma cutting, and a TruPunch 5000 punching machine, the capabilities of which have allowed Bankside Patterson to make a challenging new product in-house. Overall, the investment has increased capacity by 50 percent, eliminated the need for expensive extra shifts and significantly improved product quality.

Established in 1959, Bankside Patterson has a long-standing reputation for quality and innovation in the supply of chassis to the holiday-home and park-home industry. More recently, the company expanded its range of products and expertise to include steel frames for modular buildings. Employing 180 people at its 100,000 ft² facility, the company has seen turnover double in the past four years to circa £25 million.

There are many reasons for this impressive performance. For instance, the company is arguably best known for changing the holiday-home market with the launch of its Fusion chassis range. Furthermore, Bankside Patterson is benefiting from a distinct shift in the holidaying habits of Britons. 'Staycation' rather than vacation is seeing more and

more Brits opt for holidays in the UK rather than abroad, in turn driving greater demand for holiday homes. As a result, the company's production shop had become extremely busy, prompting the need for new investment.

Shaun Gadsby, senior sales and commercial manager at Bankside Patterson, says: "We were running 24/7, which not only meant high overtime costs, but restricted our ability to win new business, we simply couldn't take on any more. We knew that investing in new machines would not only help us return to a standard working week, thus improving profitability, but provide us with latent capacity which we could sell."

Reviewing the market for a suitable supplier, which included visits to see the technology in action, a team of representatives from Bankside Patterson opted for TRUMPF for two principal reasons: the quality of the machines and the high level of aftersales support.

Shaun Gadsby says "If we lose a single day due to machine downtime it absolutely kills us. We are not dissimilar to the automotive industry, where we supply our OEM customers with chassis on a JIT (just-in-time) basis. There is very little margin for delays."

Bankside Patterson duly acquired a TRUMPF TruLaser 3060 fiber laser cutter, TruPunch 5000 and TruPunch 1000 punching machines, and a TruBend 7036 press brake.



Shaun Gadsby continues: "Prior to the TruLaser 3060 fiber we were plasma cutting many of the main chassis members. Comparing the two processes, the difference in speed and quality of cut is astounding, they are poles apart. The laser cutter is not only extremely rapid, but the clean cuts make plasma cutting look like it has been done using someone's teeth."

The TRUMPF TruPunch 5000 has also had a huge impact at Bankside Patterson. Replacing an ageing punch press that was beginning to show efficiency and quality issues, the TruPunch 5000 has allowed the company to make an important new product in-house.

The ability to manufacture in-house also provides the company with more control over the quality of its components and enables quicker responses to changes in customer requirements.

While the ISO 9001 accredited company produces steel parts up to 3 mm on the TruPunch 5000, thicker components tend to go on the TruLaser 3060 fiber, sometimes measuring up to 10 mm in thickness.

Shaun Gadsby concludes: "The two processes complement each other very well. We can move certain parts between the two if necessary to balance requirements. This flexibility is important as we are currently seeing record throughput levels; around 500 chassis a week in up to 250 variations. However, we have only achieved this through our investment in TRUMPF technology. The new machines have boosted our capacity by 50 percent, while at the same time allowing us eliminate the need for extra shifts."

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CSI Aluminium chooses Tekna heavy duty machining centre

CSI Aluminium has chosen a Tekna TKE 944-7 4-axis heavy duty machining centre for its Hull factory, supplied and installed by Emmegi (UK).

Having been a very satisfied Emmegi customer for nearly 20 years, the company had no hesitation in approaching Emmegi again when they needed a new large capacity machine with a 7 m bed.

CSI Aluminium is a specialist glazing and cladding fabricator which has developed its own bespoke unitised curtain walling system for installing on sites with limited access for installation. This system, which uses large 7 m sections of Aluprof profile, has huge advantages for city centre sites because it can be installed from a tower crane.

In order to maximise the commercial benefits of this system, CSI approached Emmegi (UK) for a machine which could achieve the technical and performance levels required with a dedicated machine setup, but which crucially still represented good value.

The big benefit for CSI since it purchased its original Emmegi Phantomatic machining centre and Classic Star and Twin Ferro saws

is that, in the intervening years, the global Emmegi group has acquired both the Tekna and Keraglass machinery businesses. This means that Emmegi (UK) now has access to a much broader range of machine options, so can advise customers on the best option for virtually any drilling, machining or threading requirement.

The team at Emmegi proposed the Tekna TKE 944 machine as the perfect solution for CSI, because it has the large machining capacity required at the right price point and can link easily to the rest of the Emmegi machines in the factory.


It is a 4-axis machining centre with a mobile gantry and 8 kW high torque electro spindle suitable for heavy duty machining of the large sections of aluminium which CSI are using. The spindle moves along the A axis, allowing machining through a full 180° around each section. A clamp unit ensures the correct positioning of the sections every time, and counterblocks can be mounted quickly and accurately.

A 12-piece tool magazine mounted on the gantry gives customers maximum flexibility and reduces tool change times.



Steve Bird, production manager at CSI, concludes: "The machine is doing all that Emmegi (UK) promised and is already helping us to deliver on a new £3.5 m contract for our unitised curtain walling system in central Manchester.

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