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Tooling innovations from Horn

The recent introduction of four new product ranges by Horn underlines the company's commitment to constant innovation as well as the strength of its R&D department.

For example, when producing small and miniature parts from difficult-to-machine materials using the company's Supermini, Mini and 312 tool systems, the German manufacturer has developed EG3 and EG5 coatings with different substrates and layer thicknesses. Their low friction properties reduce the amount of heat transferred to the tool, especially the cutting edge. Compared with previous coatings they can double tool life, depending on the material being machined. A golden wear layer improves wear detection.

Horn's milling tools based on Boehlerit products have been expanded to include two ranges of arbour milling cutter, the ETAtec 45P face mill and the ZETAtec 90N roughing mill, with



diameters from 50 mm to 160 mm. The former is equipped with between five and ten 7-edge inserts. The tools not only offer a 45-degree angle of attack and positive geometry but also generate low cutting forces. They are well suited to machining stainless steels, titanium and nickel-based alloys. ZETAtec 90N tools have a similar number of 6-edge inserts. Their high reliability during roughing, including when employing helical or linear plunging, is due to the negative geometry while the positive rake angle ensures a smooth cut.

The new DPP range of solid carbide drills from 4.0 mm to 18.0 mm in diameter feature high quality machined surfaces due to the precision of the ground geometry and the cutting-edge preparation. Together with various coating options, they ensure reproducible results. Available for 3 x D, 5 x D and 8 x D hole depths, they are most suitable for cutting unalloyed, cast and alloyed steels of tensile strength up to 1,000 N/mm². All tools feature internal cooling, although a variant without internal coolant delivery is available.

For gear production, Horn's product portfolio comprises a range of milling and broaching tools for the production of tooth geometries from module 0.5 to 30. Whether this involves gear cutting for spur gears, shaft/hub connections, worm shafts, bevel gears, pinions or customised products, all tooth profiles are manufactured cost-effectively. The company's new skiving tool range is a result of the wider range of applications made possible by modern machining centres and universal turn-mill centres with synchronised spindles and process-optimised software, as they can accommodate the complex technology.

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Reduced cost, increased production efficiency

EROWA counts well-known companies on every continent among its customers. Machine manufacturers, fixtures, tool and mould makers, as well as production companies in the electronics, automotive, watchmaking, medical technology, and aerospace industries, cutting tool manufacturers and subcontractors.

Since their introduction in 1987, today more than 3,000 robot systems are in operation all over the world. Some of the first robots are still working alongside the third or fourth machine, emphasising their reliability. EROWA Robots are available for any machining technology in a large number of configurable variants. The impressive product line ranges from simple units for retrofitting existing machines to state-of-the-art linear automation systems handling several machines via a robot.

Setup and preparation of tasks during production, as well as automatic loading of machines, provide up to five times the productive hours per machine, made possible by the modular EROWA JMS 4.0 production line process control system. Clear competitive advantages result from productive use of night and weekend hours, reducing both delivery times and manufacturing costs. Automatic manufacturing of small batches and individual parts can be realised with the EROWA JMS 4.0 production line process control system.

EROWA Robot Easy

The EROWA Robot Easy is ideally suited to help existing machines achieve new levels of productivity. It fits all machines with two different transfer axes available, depending on the workpiece weight. Large workpieces measuring L 500 x W 500 x H 400 mm can fit in the magazine.

The machine and robot are controlled via the EROWA process control system. This ensures you get a clear overview of the production cell, so that orders, CNC programs, tool management and the current status are always clearly visible. Machines with automatic workpiece change can deliver up to 4,000 more productive hours per year.

The Robot Easy can be retrofitted to all machines. Fluid carried out of the machine by the pallets fully accumulates in the collecting tank and is fed back into the



machine. In most cases, an automatic door is required when retrofitting an existing machine. The solution is the well-designed RoboDoor. This door is installed in the machine during the setting up of the robot.

EROWA Robot Compact 80

The EROWA Robot Compact 80 has been designed with a small footprint of two square metres, with the optimal ratio of magazine positions. Hanging or standing electrodes, pallets of different sizes and the length of the workpieces are accommodated.

A user-friendly integrated loading station is used to set up and preset workpieces at the ergonomically correct height while the robot is working.

A manufacturing cell with two machines and a EROWA Robot Compact 80 takes up little space. With productivity built on a footprint of only 2 m², the Robot Compact

makes the machine highly independent. As it is exactly aligned with the machine, no additional safety barriers required.

Each magazine level is equipped with integrated pallet positions and drawers by which they can be quickly released. Integrated LED interior lighting for clear overview. A manufacturing cell with two machines and a EROWA Robot Compact 80 takes up little space.

The Robot Compact makes the machine highly independent. It can operate using a combination of pallet types and sizes. Reloading can take place from the integrated loading station with a 80 kg transfer weight. Heavy workpieces are loaded with the overhead crane or with an EROWA lift directly onto the pull-out loading station.

EROWA Robot Multi

The Robot Multi unlocks its full potential between two EDM machines. Electrodes and workpieces are loaded to the left and right sides. Two machines, one robot. The process guidance system controls the cells individually, while the robot is shared. The Robot Multi is suitable for loading any type of machine, horizontally or vertically on table and quill.

Every inch is utilised. Robot and machine form an optimised system. Workpieces weighing up to 80 kg are placed into the machining area reliably and quickly. 30 positions per level are available for electrode holders. With a maximum of nine



levels, this provides 270 slots. In series production, the EROWA Robot Multi increases the productivity of CNC machines many times over.

The Robot Dynamic is suitable for loading large and small workpieces. One of the important features for automated manufacturing of single parts and small batches is that the system can switch automatically between different pallet sizes. The additional joint allows operating even in a small space.

EROWA Robot Dynamic

Thanks to the large coverage of the robot arm (2.30 m), these machines can also be accessed at any time for manual activities.

A highly efficient system for automating the manufacture of single parts and small batches, workpieces are supplied and removed via the integrated setup and loading stations. When needed, another magazine is added. The Robot Dynamic changes pallets with a total weight up to 250 kg reliably onto the machine.

The robust linear rail is extended in segments to the right length. All cables and connections are integrated. Telescopic axis with maximum travel and minimal interference.

Measuring stations, such as the CMM Qi, are also integrated in the overall manufacturing process and loaded automatically.

Loading large workpieces automatically and accurately on the machine places some demands. Small batch and mixed workpiece sizes as well as different machining techniques require flexible production systems. The EROWA Robot Dynamic 500 is the ideal handling solution for large and



small workpieces. A Robot Dynamic 500 consists basically in a transfer unit and various magazines. They are supplemented with a gripper pool, loading station, and linear axis. In the linear version, the robot handles up to eight machines. The rotary magazines can be loaded and unloaded manually at any time, while the robot handles the other magazines and machines without interruption.

500 kg transfer weight from zero to 500 in 15 seconds, that is the time the robot needs to change the gripper and pick up the heavy pallet. Despite the capacity for heavy loads, lightweight pallets are transported with the same reliability as well.

The robot system can also be adapted and modularly extended at any time. The Robot Dynamic 500 changes pallets with a total weight up to 500 kg reliably on to the machine. On the loading station, the operator prepares the next jobs while the robot continues to supply the machines with work.

Large MTS pallets with part sizes up to

800 x 800 x 500 mm can be handled easily onto the machine and just as reliably it takes smaller workpieces from the magazine to the machining location.

EROWA Robot Six

The EROWA Robot Six combines the benefits of efficient series production with the flexibility of the EROWA JMS 4.0 production line process control system for automated single part production and is suitable for loading any type of machine, horizontal/vertical or on table and quill.

Using a 6-axis robot basically allows you to utilise more degrees of freedom and to use types of different weight classes. This is based on standardised interfaces and options, to ensure optimal integration.

The Robot Six boasts a lean yet robust design. Even large and heavy workpieces are loaded accurately onto the machine and into the magazine. The linear rail is extended in segments to the right length and machines can be positioned on all four sides.

Depending on the order, the robot loads blanks, palletised workpieces, and fixtures onto the machine. The EROWA JMS 4.0 production line process control system plans, monitors and evaluates the complex processes.

Stored in the integrated gripper station, the right system gripper is available at any time. Regular check of the reference coordinates ensures high process safety. In addition, outbreak protection is ensured using safe software and corresponding configuration.

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Mazak showcases trio of turnkey automation solutions

Yamazaki Mazak provided three productivity-enhancing machine tending solutions at MACH to demonstrate how manufacturers across the UK can drive tangible productivity benefits from turnkey automation solutions.

With interoperability, technical assistance and decentralised autonomous decision-making, fundamental design principals of Industry 4.0, Mazak has devised a number of new automation systems which can allow machine users across all vertical markets to improve production times and increase overall factory efficiency.

One of the stand-out attractions on display was the UK-manufactured QUICK TURN 250MY and TA-12/200, a high performance turning centre with a 'plug and play' automation solution. It is designed to appeal to customers requiring a single-source supplier for both machine tool and automation.

Ideal for applications that require lights-out unmanned running overnight or at weekends, both the machine tool and the

robot are controlled from the Mazak SmoothG CNC, which provides a seamless interface and extremely fast setup.

The FANUC M-10iA robot is capable of moving a maximum payload of 12 kg and is equipped with separate grippers for loading and unloading. In addition, the automation solution has a unique workpiece stacking principle utilising interchangeable workpiece support pillars, with layout and setup guided by a GUI (Graphical User Interface), which is also integrated into the SmoothG CNC.

The ease-of-integration between machine tool and robotic automation all controlled via SMOOTH Control, is a tangible example of Industry 4.0 in action for manufacturers at all stages of the supply chain, with the turnkey solution proven to shorten lead times and lower indirect labour costs. Mazak estimates that the automation solution could have a payback period of as little as six to eighteen months.

Given the sheer variety of highly complex parts subcontractors in the aerospace sector

produce, Mazak's VARIAXIS i-300 AWC (Auto Work Changer), a compact 5-axis automation cell developed for high mix, low volume production, was a must-see at the exhibition.

The machine has a gantry box structure which incorporates all of Mazak's automation knowledge from its PALLETECH range. The side-loading AWC allows the operator access to the front of the machine uninhibited by the automation and can be specified with 32 or 40 workholders. The machine has been developed for lights-out machining and is equipped with a field expandable tool magazine that can hold up to 505 tools.

Completing the trio of automation technologies on display at MACH was the MULTIPLEX W-300Y + GL-200, a twin-spindle, two-turret machine equipped with superfast gantry loader for ultimate productivity. Ideally suited to the demanding turnaround times associated with the automotive sector, this machine and automation configuration is equipped



One of the stand-out attractions on display at MACH was the new UK-manufactured QUICK TURN 250MY and TA-12, a 'plug and play' turning centre and robotic machine tending solution

with a new rack and pinion drive system for the gantry loader, which offers rapid rates in the A and B axes of 75 and 160 m/min respectively, realising a potential 25 percent reduction in load/unload time.



The VARIAXIS i-300 AWC (Auto Work Changer) is a compact 5-axis automation cell developed for high mix, low volume production



Completing the trio of automation technologies on display at MACH was the MULTIPLEX W-300Y + GL-200, a twin-spindle, two-turret machine equipped with superfast gantry loader

Yamazaki Mazak Corporation was founded in 1919 in Nagoya, Japan. The company now has over 6,600 employees worldwide.

Yamazaki Mazak has nine existing manufacturing plants, with five in Japan, as well as manufacturing operations in the United States, the United Kingdom, Singapore, and China. Products include multi-tasking machines, CNC turning centres, vertical and horizontal machining centres, CNC laser cutting machines, flexible manufacturing systems (FMS), CAD/CAM products and factory management software.

A worldwide network of 77 technology centres and technical centres provide comprehensive customer support on a local basis. The European manufacturing plant in the UK also provides the European group headquarters for more than 900 employees and 15 technology centres and technical centres.

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A vision for success with robotic machine tending cells

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Universal robots boost profitability at machining company

A leading specialist in multi-axis machining is leveraging the benefits of Universal Robots supplied by RARUK Automation to load and unload its machine tools. A mix of seven UR5 and UR10 robots has helped Rousant Sherwood maximise the productivity of its workforce by automating repetitive tasks and allows the company to bid for contracts which would have otherwise been unprofitable.

Rousant Sherwood Manufacturing (RSM) is a family-owned company, based at Henley-on-Thames, that has been specialising in the subcontract manufacture of complex machined components for over 40 years. In this time, the company has built-up an outstanding international reputation in industries such as medical, aerospace and oil & gas.

RSM has always understood that continued investment in state-of-the-art manufacturing technologies is the key to its success. The company has 11 Nakamura-Tome multi-axis, multi-turret, twin-spindle turn-mill centres, complemented by the latest 13-axis sliding-head turning and 4-axis milling capability. As a result, the company has minimised both cycle times and the number of setups required. However, faced with an increasingly competitive global marketplace, the 35-employee company wanted to make further efficiency gains, deciding to focus its attention on automation.

Robin Salter, general manager at RSM, says: "In effect, the only advantage that competitors in low-wage economies have in

their labour costs, so if we can eliminate that element from the calculation it levels the playing field."

Surveying the entire range of industrial robots available, RSM concluded that 6-axis universal robots were the ideal match for its machine-tending requirements, largely due to their ease-of-programming, competitive price and collaborative operating capabilities. Collaborative robots, 'cobots', use innovative sensor technology, programmed with a pre-determined force, to stop safely in the event of human contact. As a result, around 80 percent of the thousands of Universal Robots in use worldwide operate with no safety guarding after risk assessment.

Robin Salter says: "The ability to use the robots unguarded was something that appealed, as was the ease-of-programming. Programming is very intuitive, it can take as little as 10 minutes to program one of our robots for a new part. What's more, we recently trained one of our apprentices and he picked it up in an hour."

In total, RSM has invested in five UR5, 5 kg payloads, and two UR10, 10 kg, universal robots, with RARUK Automation as its supplier of choice.

Robin Salter continues: "We like working with RARUK Automation as they are a dedicated automation company with a highly qualified team. The robots are really reliable, but we know there is always someone on standby to offer technical guidance if required. We always get really good support from RARUK Automation."

RSM's seven Universal Robots are today busy tending the company's 14 CNC machine tools, with robots frequently relocated to different machines in line with customer/contract demands. One of the UR10 robots is currently serving a Nakamura-Tome Super NTJX multi-tasking turn-mill centre. The robot loads square billets of aluminium into the machine, where they are turned into aerospace components in a



40-minute cycle. The machine and robot are running 24 hours a day, seven days a week.

Robin Salter says: "Just to be clear, we have not invested in robots to save on headcount, we've done it to win contracts. We would never have been able to tender for this job without automation. Using a robot makes us profitable on work where we wouldn't normally be able to compete."

The Universal Robot is integrated with the machine's CNC and communicates via IO links and MODBUS interfaces. As a result, the robot controls the chuck, release/grip, and the door when opening and closing. A warning light is used to tell any humans nearby that the robot is about to start operating.

Further applications at RSM include two UR5s, at a deburring station making military aerospace components, and a UR10 being used to load billets into a CNC mill. The company plans to invest in more Universal Robots moving forwards.

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Oil company invests in automation

US manufacturer looks to UK innovation to drive throughput efficiency in midst of oil sector downturn and prepare it for Industry 4.0

In order to remain competitive and maintain margins, a US company has selected a proven partnership to ensure its success far into the future. This major Texas-based oil company asked Doosan and Cogsdill to develop a process for auto-loading facing heads, boring tools and splining tools onto a conventional HBM for machining its components.

Having previously delivered solid results for the company, there was a requirement for Cogsdill's ZX modular tooling systems in its headquarters in Houston.

South Korean and UK engineers designed and manufactured an auto-coupler system, enabling the facing heads and other tooling to be automatically loaded from a tool stacker mounted to the Doosan DBC130 HBM.

The innovative adaptation of a standard spindle to incorporate a spindle interface with a hydraulically-actuated clamping system, allows tools to change

automatically. Enabling rotating and non-rotating tools, the adaptor allows interchangeability between internal contours, bottle bores and splining features as opposed to multiple operations on several stand-alone machines. Thus providing far greater capacity and drastically reduced manual intervention associated with manufacturing these components.

Enabling vast capabilities at speed and scale, also with the benefit of high-pressure coolant for swarf evacuation that cannot be efficiently achieved with conventional tooling, this new hands-off approach is a major turning point for the next-wave of fully autonomous production.

UK executive director, Lee Donaldson at Cogsdill says: "This is a fantastic collaboration with Doosan a partner that we have a great relationship with. We're continually evolving to best face engineering challenges and move towards the next phase of efficient automation,



whether it be manufacturing materials and processes, or laser-enhanced tools for auto-sizing."

Tony Dale, technical director at Mills CNC, says: "The new range of DBC machines is impressive and this ZX auto-tool interface is a real game changer and cements Doosan's global leadership when it comes to visionary heavy tool automation. It puts the HBM into a market position usually associated with RAM-type machines."

Perhaps the future of manufacturing may not yet be fully visualised, but the collaborative use of industrial know-how and attention to detail seems to be exactly what will guide Industry towards 4.0, and ensure the UK is seen as the key innovation powerhouse within global manufacturing.

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Improve your productivity

FANUC introduces new robot for welding large pieces in small spaces

A new addition to FANUC's ARC welding robot range is set to make automated welding more viable for manufacturers with compact floor space, but large workpieces. The ARCMate 100iD/10L can be used to boost the productivity of high-batch production lines, particularly those working with pieces larger than 1,500 mm Ø. Its repeatability and quality-control capability make it a particularly valuable addition to production lines that must meet high-volume orders in which the quality and function of the weld are critical.

To cope with increased production demands, the ARCMate 100iD/10L also has capacity for 10 kg of additional tooling, such as welding torches.

Tom Bouchier, managing director of FANUC UK, says: "Subcontractors that use bigger workpieces should not have to compromise on weld quality or integrity. Neither should they feel that the welding robot market is closed to them because of space limitations. In fact, the new ARCMate has been designed specifically with these limitations in mind."

Despite its higher workpiece capacity, the robot's footprint is small, around 343 x 343mm, with a compact, articulated design for easy reach into narrow spaces within machine tools or jigs. It can also be mounted either upside-down or at an angle and routes all cables and welding hosepipes internally in order to maximise its use of space.

Tom Bouchier continues: "In other words, the robot can fit around you, and not the other way around."

Further ROI can be achieved through harnessing the robot's integrated software. The R-30iB Plus controller, for example, guides an operator through setup and



programming. Manufacturers can also maintain the productive capacity of the robot through the use of Zero Downtime, an intelligent maintenance scheduling and status prediction tool.

FANUC offers a number of optional extras that can unlock the full potential of the ARCMate. Dual Check Safety, for example, reduces the space requirements of robot cells even further, and minimises the risk of injury or damage to workers, workpieces and other machinery. Operators can also install WELDPro, an application-specific addition to the ROBOGUIDE software, which allows operators to define ARC welding parameters via a part's CAD design.

Tom Bouchier concludes: "Investing in a welding robot can be a big step for many manufacturers. By making the most of its intelligent functions, however, customers should start to see significant returns a lot sooner than they had expected."

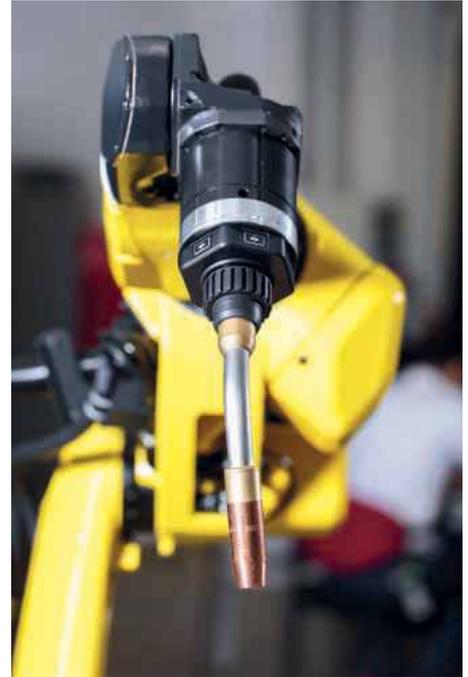
For more information on FANUC's latest ARC welding robots, please visit: <https://www.fanuc.eu/uk/en/robots/robot-filter-page/arc-welding>

New laser-guided smart welding camera for robots

A new laser-guided smart welding camera for robots, that aims to improve weld quality and reduce production costs, is being introduced into the UK market.

The new FUJI-CAM smart welding camera is being launched in the UK by Cyber-Weld, FANUC's strategic arc welding systems supplier. The product will be available exclusively to the UK market. Whilst Cyber-Weld will take the market lead, FANUC UK will support its strategic partner in supplying the FUJI-CAM device directly to automotive manufacturers. The real advantage of the FUJI-CAM is that the hardware and software can be integrated seamlessly to FANUC's Arc Mate welding robot series with minimum effort.

The FUJI-CAM is a non-contact laser vision system that helps the robot to precisely locate the position of welding joints in a fraction of a second. The system can be used on both a machined surface and stainless-steel parts, due to its proven optical sensor and control technology.



The system also aims to offer superior weld quality by ensuring that the welding torch is positioned at the correct angle at all times. The FUJI-CAM uses an adaptive welding function for self-adjustment of welding conditions, constantly adjusting the welding head to ensure optimum positioning. Crucially, the camera is equipped with a unique pressurised nozzle to protect from welding spatter and fumes, and an Optical Anti-Reflection Technology to ensure optimum performance, even with shiny joints.

The camera is equipped with a Friendly User Interface Technology (FRUIT™) interface, which provides a simple and efficient method of configuring and programming the FUJI-CAM with easy diagnostic and process monitoring capability. All programming and control is implemented by a robot teach pendant, with no PC required.

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XYZ unveils ROBO-TEND at MACH

XYZ Machine Tools, in collaboration with automation specialists Adelphi Automation, has developed a robot-based automation cell with vision system suitable for use on machining and turning centres. The new ROBO-TEND system is both modular and mobile, features that help it to bring true robot automation within the reach of traditional subcontract engineering businesses. The system was unveiled to the public for the first time by XYZ at MACH 2018.

Robot automation is nothing new, but for many the perception is that it is only suitable for high volume production environments, such as the automotive sector. The new XYZ ROBO-TEND system addresses this perception and makes automation viable for lower volume production.

Nigel Atherton, managing director of XYZ Machine Tools, says: "The availability of skilled labour is an issue that will not disappear and one way of addressing this is for small to medium sized businesses to automate lower skilled jobs, such as machine loading/unloading, freeing up

valuable skilled employees to add value further down the line. We have taken our time to research systems that are available and concluded that none met the needs of our customers perfectly. Therefore, we developed this partnership with Adelphi Automation to create ROBO-TEND, which we believe will open up automation to a much wider audience at a very competitive price."

ROBO-TEND is a flexible modular system that can be adapted quickly and easily to suit changing working situations, with its standard interchangeable interface making it suitable for a wide range of CNC machines. The system is based around a self-contained KUKA Cybertech KR10 R1420 robot, with a rated total load of 10 kg, larger capacity robots are available. The robot is managed via the KUKA KRC4 compact robot controller, which is integrated within the system's handle, this handle is used to manoeuvre and reposition the robot in front of the machine. The robot's vision system is then used to calibrate it using the orientation plate fixed to the



machine. With the robot in place the components are presented to it in a secondary storage trolley. Components are held in four drawers that feature dual access, one side where the robot picks from and the other where the drawers can be pre-loaded out of the working area.

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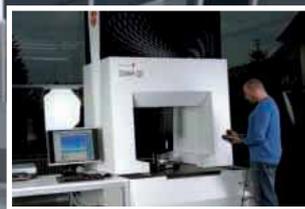
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Is the Medical Device Regulation a threat to additive manufacturing?

When the European Union's new Medical Device Regulation (MDR) was first introduced in 2017, it set in motion a three-year countdown to its full application in 2020. The MDR could drastically impact the way that medical devices are made in the EU, particularly those that are produced using additive manufacturing. Here Bryan Austin, general manager of global engineering company, Renishaw's medical and dental products division, gives his advice on how companies in the additive manufacturing industry should handle the MDR.

The new regulation suggests that any medical device mass produced by means of an industrial process no longer falls under the 'custom-made' exemption and therefore requires its own clinical evidence to authorise its sustainability. It also needs its own CE mark to prove it has been tested and meets all relevant standards.

The problem is that there isn't a clear definition of 'mass-produced' or 'industrial manufacturing processes'. Without these terms being defined, there is a risk that the regulations will cover additively manufactured patient specific implants (PSIs) when produced on an industrial scale, even though each one is unique.

Additive manufacturing for healthcare

Additive manufacturing is a core technology for rapidly producing custom metal parts, with complex geometry for the medical sector. Metal powder is fused together layer by layer, using a laser, to build complex components that may not be possible with subtractive manufacturing.

Additive manufacturing can produce components with variable surface finish to suit different surgical procedures. It can also produce complex lattice structures more efficiently than traditional subtractive machining can.

Additive manufacturing can produce components with variable surface finish to suit different surgical procedures. It can also produce complex lattice structures more efficiently than traditional subtractive machining can.

The major advantage of the technology, is that it allows implants to be designed specifically to a patient's magnetic resonance imaging (MRI) or computed tomography (CT) scans. This means medical devices can be produced as a one off, unique product, specific to an individual's needs.



Benefits of AM

Patient specific additively manufactured implants are helping to improve treatment processes, decrease procedure revision numbers and reduce surgery times, which can also reduce costs for the NHS and provide better patient outcomes.

Traditionally, if a patient had a particular cranial tumour, a surgeon would first have to remove the tumour and close the wound. The patient would then require further CT scans to determine the size of the cranial plate needed, dependent on the size of the wound from the previous surgery. The surgeon would then perform a second procedure to insert the implant.

Additive manufacturing removes the need for a second procedure by enabling pre-planning and the production of patient specific surgical tools, that define exactly the size of the wound that will be left. Having fewer procedures needed for the same result improves the process for both patient and surgeon.

Despite the benefits AM has offered so far, the new MDR may interfere with the use of additive manufacturing in the medical industry in the future.

What can you do?

The MDR has been released already, but the subsequent guidance documents could be influenced if enough manufacturers have an

input. Patient specific implants are already being used in surgeries across the world, with Renishaw working specifically with a number of hospitals in Wales and the South West to improve patient outcomes.

An interpretation of the regulation as it currently stands may mean we will not be able to help patients in the same way once they come into full force. For the technology to reach its potential, industry and healthcare need to work together to develop a body of evidence to demonstrate the efficacy and benefits of the technology.

The only way to prevent the MDR from having a negative impact on additive manufacturing is to prove its worth, not just for hospitals and medical professionals, but also for patients that have the potential to receive a better outcome.

For more information on how advances in additive manufacturing have inspired a number of surgeons to commission metal 3D-printed PSIs, visit <http://www.renishaw.com/en/medical-and-healthcare-case-studies--39174>

Renishaw neuromate stereotactic robot assists SEEG procedures at The Walton Centre, Liverpool

Neurosurgeons at The Walton Centre, Liverpool, UK, have recently carried out its first two stereoelectroencephalography (SEEG) procedures with the assistance of the

Renishaw neuromate stereotactic robot. The Walton Centre is the only NHS Trust in the UK dedicated to neuroscience, and the staff includes many leaders in their areas of expertise. The procedures with a neuromate robot marks a transition to robot assisted neurosurgery which should see both patients and staff benefitting from reduced procedure times.

SEEG is a procedure used in the treatment of epilepsy. Multiple intracerebral electrodes are inserted into the brain in preplanned trajectories to gather data and map brain activity. By doing this, neurosurgeons aim to identify the region responsible for generating epileptic seizures. Once the epileptogenic region has been identified neurosurgeons can follow up with a tailored resection to remove the problematic tissue.

The epilepsy neurosurgery team at The Walton Centre is led by consultant neurosurgeons Prof Paul Eldridge and Jibril Osman-Farah, who estimate that the use of the neuromate robot will reduce procedure times significantly. Following the recent procedures, Professor Paul Eldridge and Osman-Farah commented: "Accurate targeting by multiple electrodes is essential

to understand the location of the epileptic focus, prior to consideration of its excision or ablation. Since there are multiple trajectories to be both planned and executed it is highly suited to a robotic system fulfilling the requirement for a repetitive stereotyped activity. Without the robot it becomes impractical to consider such a series of multiple electrodes in a reasonable length of time for the procedure."

Renishaw's neuromate robot can bring benefit to SEEG procedures by assisting with time-efficient positioning of electrodes and dramatically reducing overall procedure time. By accurately aligning the electrodes according to the neurosurgeons pre-planned trajectory, the neuromate robot helps ensure that neurosurgeons safely reach the targeted anatomy.

The Walton Centre, which was able to acquire the robot through charitable support, is now one of a growing number of hospitals worldwide benefitting from improved accuracy and reduced procedure



times by working with the neuromate robot. Stuart Campbell, clinical sales development manager at Renishaw, concludes: "The time saved during this latest procedure is a great result for the neurosurgeons and for the patient. We look forward to working closely with the team so that patients can continue to benefit from this innovative technology."

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Facial mapping to improve cleft lip and palate surgery in developing world

Facial mapping technology developed at the University of Glasgow promises to revolutionise the standard of surgery on children with cleft lip and palate in developing countries.

Statistics lecturer Dr Liberty Vittert and Prof Adrian Bowman, head of the school of mathematics and statistics, have developed a 3D-mapping system that measures facial symmetry to within one thousandth of a millimetre.

The innovative technique will help train doctors in developing countries to perform surgery on children with cleft deformities. More than 170,000 children are born with a cleft deformity in developing countries every year. A 3D post-surgery photograph is taken of the patient and a mapping algorithm measures facial symmetry, allowing the success of surgery to be objectively assessed and flagging up cases where the surgeon could benefit from more training.

Dr Liberty Vittert, the University's Mitchell lecturer in statistics, has recently returned from Smyan Hospital in India, where she set

up a pilot project with Smile Train, an international cleft charity that empowers local medical professionals in the developing world with training, education, and resources to provide cleft surgery and comprehensive cleft care to children in their own communities. Based on the success of the pilot, the aim is to acquire funding to roll out this project to the entire Smile Train network in more than 72 countries and 1,100 partner hospitals.

More than 170,000 children are born every year in developing countries with a genetic deformity. Smile Train has transformed the lives of children born with cleft lip and palate by empowering local doctors to provide more than one million free cleft surgeries in the developing world.

Dr Liberty Vittert says: "Children in developing countries deserve the same high standard of treatment that children receive in developed countries. 3D facial mapping will level the playing field by improving the standard of facial surgery care for these children.

"Cleft-lip and palate deformities can



cause terrible suffering in developing countries, where children become malnourished as breastfeeding is impossible and they have difficulties speaking, hearing and breathing. In some cultures, without proper treatment, children are often abandoned or are ostracised by their communities.

"This system gives surgeons the tool to continually assess their own work, leading to higher standards of care."

The University of Glasgow team is applying for funding to roll out the pilot.

University of Glasgow
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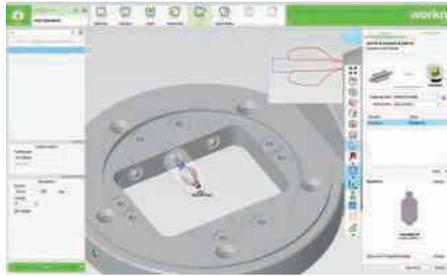
WorkNC Dental manages automation for DESS

Dental implants may have a simple appearance, but they require complex manufacturing technology that has propelled the prosthetic industry to very high standards. And WorkNC Dental from Vero Software automates two vital parts of the production process for a leading company in the field.

DESS (Dental Smart Solutions) was founded in Barcelona in 1947 and specialises in the manufacture of implants and prosthetic solutions for customers in 30 countries. The design of its product line is based on its own CAD/CAM libraries, available on the market as 3Shape, Exocad and Dental Wings.

During the process of prototyping and prosthesis milling, DESS relies on Hexagon Manufacturing Intelligence solutions. WorkNC Dental software automates both the machining process and the positioning of parts on the disk or premilled blank, along with the placement of support connectors. These benefits not only apply to the milling of soft materials but also to the milling of metals and ceramics.

WorkNC Dental is a CAM software developed by Vero Software, and enables DESS to produce customised prototypes and prosthetics. Through this tool, it generates machining strategies of the implant abutment before creating the final product, and those strategies are stored in



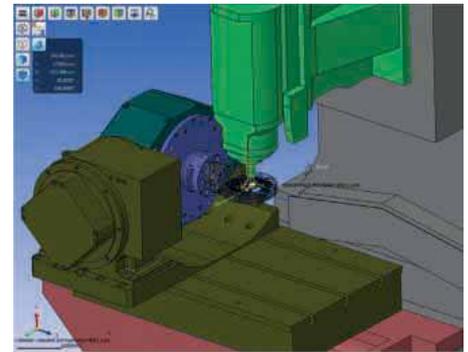
the CAD/CAM library, for use with future projects. An example of this is a new screw model for angled prostheses, where the milling process had been previously carried out with another project using WorkNC Dental.

Ramón Terrats, head of DESS's technical department, says: "High precision is indispensable in our daily routine. The market and the real needs of the product require very tight tolerances and high repeatability,"

WorkNC Dental incorporates an Implant Manager function, which allows a Brep, exact surface definition, to be connected automatically to STL prostheses of all dental CAD systems.

DESS uses Roland and Robodrive CNC machine tools for developing prototypes and testing products and to mill customised prostheses, as well as the final machining process.

Recently, the company interconnected all its machines and software through an Ethernet network. Ramón Terrats says the milling process of customised prosthesis is very simple, thanks to the Vero Software technology. "First, we receive an email with the CAD prosthesis designed with the DESS CAD library. Then, the DESS technician includes this STL CAD file in the WorkNC environment. And thanks to the Implant Manager application WorkNC recognises



the Implant connection and position in the prosthesis, and places it in the right way in the blank.

"It automatically applies a previous configured CAM strategy to the customised geometry then WorkNC Dental generates the CAM program and sends it to the milling machine."

DESS uses a Hexagon DEA coordinate measuring machine (MMC) in its reverse engineering process and the company has been using Hexagon MMC since 2004 and WorkNC Dental software since 2012. DESS works for many dental laboratories, milling centres and dentists. The company says the development process of each prototype is essential when it comes to reproducing the specific framework for individual clients. WorkNC Dental means DESS can replicate the problems and challenges they face daily.

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Over 20 years' service and still going strong

In 1997, young engineers Rosario di Gerlando and José Freire had their very first Deco machine delivered by Tornos. Still in use today at the Lauener facility, it shows an impressive operating hour meter display of 76,301 operating hours.

Now, the Boudry-based company near the French-Swiss border has almost 150 machines. The dedicated workshop for medical products represents about 50 percent of the company's sales and the workshop is crammed with Deco and EvoDeco machines only. Medical department manager José Freire explains: "The Deco/EvoDeco product is really accomplished and we are fully familiar with it."

The company has been certified according to ISO: 9001, ISO: 14001 and ISO: 13485, but as CEO Emmanuel Raffner says: "These standards are a good basis for us to validate our processes. However, the requirements of our customers are consistently more demanding. This is the reason why we focus on two fields: watch making and the medical industry. It's also why we purchase equipment that enables us to meet the specific demands."

Shared know-how

It's true that the expertise gathered in the field of medical technology has benefited watch making, and vice versa. The latter especially applies to the know-how required to produce minute parts. "Our experience in watch-making and especially in the manufacture of watch movement parts with a size of less than one millimetre helps us to produce ophthalmic needles with a diameter of a few hundredths of millimetres," explains José Freire. The realisation of such parts is the standard for Lauener.

Flexibility and validation

Production at Lauener certainly has to be flexible. In fact, it must be capable of simply reproducing the prototyping processes and the processes for small-batch production in a real production cycle. "In a manufacturing cell for the medical industry, we carry out new setups every day. For some parts made of tough materials, new tools are required daily," says José Freire.

Training has always been a key to the company's success. As far as awareness and



From left to right: Rosario du Gerlando, training manager and José Freire, medical department manager

vocational education are concerned, Lauener has always attached great importance to training. With the introduction of the TB-Deco software in 1997, the company substantially contributed to the training of its employees in the use of the Windows® tools. This was done by organising training courses and financing 2/3 of the acquisition cost for home computers for the employees.

Deco & EvoDeco - controlling processes

The machine bank consists of Tornos Deco and EvoDeco machines and is supervised by José Freire. Both the kinematic system and the programming of the first Deco machines from 1996 are similar to those of the more recent EvoDeco machines last supplied. During that time, numerous attachments and toolholders have been provided with an interchangeable design. "We decided to purchase the machines due to their flexibility, productivity and precision. They did not disappoint us. The machines fully meet the current requirements and will certainly meet the future needs of the business. These machines are extremely versatile and we can produce virtually any part on them," continues José Freire. "For us, the kinematic system and the PELD language are the really strong points of the Deco and EvoDeco machines. For production of complex parts, the machines remain the best in the market. These machines can machine workpieces that no



Tornos delivers flexibility to Lauener

other machine can realise." Thanks to its optimum control characteristics, a new EvoDeco machine installed at Lauener will be fully operational in less than one week.

A customer-oriented approach

Asked about the responsiveness and quality of the Tornos service, the Lauener managers confirm: "We are fully satisfied with our relationship with Tornos and we are following the evolution of the Tornos products with great interest. For almost two years we have been feeling that Tornos is following an even more customer-oriented approach and this is certainly confirmed in our decisions upon machine acquisitions."

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Technology centre invests in Colchester Machine Tool Solutions

Further demonstrating its reputation for supplying high quality, precision machine tools into the education and training sector, 600 UK, now Colchester Machine Tool Solutions, has installed a range of manual lathes, mills, drills and saws into Coleg Cambria in North Wales.

Coleg Cambria is one of the UK's largest colleges, with over 7,000 full-time and 20,000 part-time students. The college has made a large investment in manufacturing equipment from 600 UK to meet the training needs of some high-profile construction and aerospace employers in the region.

Nick Lyon, assistant principal at Coleg Cambria, says: "When we developed this engineering technology centre in Cambria, we were really keen to ensure the fundamental engineering aspects of machining were maintained. We've had a great relationship with 600 Group over many years and the equipment has always been high quality and most importantly, my learners enjoy using the machines."

One of the students at Coleg Cambria gave a general overview, saying: "I came to Coleg Cambria with no machining experience and the machines are very easy to use, the dials and gauges are well marked and intuitive and it makes the education process easier to understand how things work. You can easily switch from imperial to metric and this simplifies the learning process."

Nick Lyon continues: "To meet industry standards, you have to have industry standard equipment and the 600 Group, with the Colchester and Clausing machines, can give us that quality, accuracy and the fundamental basics of what learners need in industry. This year we had 14 learners in the



world skills competition at the NEC and two returned with medals in the CNC category, whilst apprentices from JCB and Magellan aerospace picked up medals in the manufacturing challenge.

"Working with the likes of the 600 Group you are being exposed to state-of-the-art equipment. It really doesn't get any better. Once students progress from manual machines we also have three CNC lathes and three CNC mills, so learners are exposed to the complete machine shop environment."

The order comprised of fourteen Harrison M300 lathes, six Clausing 3VS milling machines, three Clausing pillar drills and a Clausing bandsaw.

The geared headstock Harrison M300 lathes have a global reputation as the benchmark training lathe, with unrivalled standard build and safety features in a compact footprint, allowing learners to confidently use the equipment to gain industrial level training.

Coleg Cambria chose the Clausing mills, drills and bandsaws to complement the Harrison lathes perfectly and are all key engineered products in the industrial sector and like the lathes, are ideal for transitioning students making the step from learning into industry.

Paul Rushworth, Colchester Machine Tool Solutions sales director says: 'Our ability to supply and project manage a range of industry ready education machine tools as a one-stop-shop for customers to specify their exact requirements is the key to our continued success in the education sector and the Coleg Cambria facility demonstrates that perfectly.'

The 600 Group PLC is a diversified engineering group with three principal areas of activity:

Machine tools

The business has a strong reputation in the market for metal turning machines. Products range from small conventional machines for education markets to CNC workshop



machines and CNC production machines. The manufacturing footprint is supported by selected outsourcing partners and machines are marketed through the Group's wholly owned international sales organisation.

Precision engineered components

Machine spares are distributed to customers globally to help maintain the installed base of group machines which number in excess of 100,000. Additionally, workholding products and taper roller bearings are sold via specialist distributors to OEMs including other machine builders.

Laser marking

Laser marking is a technologically superior alternative to inkjet marking. It requires no consumables and can operate on a continuous high-speed basis when integrated into customers' production lines. The business has its own technology and proprietary software. Customer applications are diverse and range from telecommunications to pharmaceuticals. The requirement for increased product and component traceability is one of the market drivers.

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Intelligent machine productivity in a compact footprint

Okuma launches two-spindle smart CNC lathe 2SP-2500H
Okuma, represented in the UK by NCMT Ltd, has added the 2SP-2500H CNC lathe to its line of smart machines. The machine has innovative front-facing twin spindles that provide significantly higher levels of productivity and far greater reliability in mass production, especially for automotive parts. The compact automation-ready machine provides excellent floor space utilisation and integrates two lathes into one unit with a standard loader for continuous front and back work.

The latest entry in Okuma's 2SP-H Series of two-spindle CNC lathes is designed to provide consistent quality in mass production whilst increasing efficiency through process-intensive machining and automation. The lathe enables stable unattended production over long runs via a high-speed loader feeding blanks. Due to the machine's unique design, the loader is able to enter the 2SP-2500H regardless of the turret's position. Since turret retraction is not necessary, workpiece transport and changeover times are greatly reduced.



With 5,000 min⁻¹, the lathe's turning spindle offers the fastest spindle speed of its class. The 2SP-2500H offers unrivalled floor space utilisation with the smallest-in-class machine width of 2,200 mm. Despite its compact dimensions, the machine features an impressive maximum turning diameter of 250 mm.

The 2SP-2500H is 20 percent faster than previous models. With a maximum spindle speed of 6,000 min⁻¹ and a doubled max motor output of 7.1 kW, the machine's milling capabilities are on par with that of a small machining centre. Other applications include powerful face milling, drilling and tapping.

Okuma's Intelligent Technology application Thermo-Friendly Concept minimises thermal deformation and enables supreme accuracy. Okuma's Tool Life Forecaster predicts the remaining time before an exchange is required and prevents cutting edge breakage, thus reducing costs.

NCMT Ltd Tel: 020 8398 4277
Email: daveburley@ncmt.co.uk www.ncmt.co.uk



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

Prices start from
£24,150.00
with Fagor 8055
control

Ajax Machine Tools International
Tel: 01590 676000
www.ajax-mach.co.uk

TPG Engineering's advanced manufacturing centre sets new standards in tube sheet production

TPG Engineering, the Dukinfield-based specialist manufacturer of heat exchangers and condensers, has established an integrated, advanced manufacturing centre that "will revolutionise tube sheet manufacturing on the site."

The Greater Manchester company is a subsidiary of TP Group, a major Tier 2 supplier to prime contractors in industrial, energy, process and defence sectors. The Group has invested almost £2 million in machines, facilities and personnel to build one of the most advanced facilities of its kind in the North-West of England.

The centre was initially designed for the production of high-specification heat exchanger tube plates, inspired by a major nuclear power project won in 2016. The company's project director, Darren Sadler, says: "The combined capability of these machines is ideal for the production of physically large and highly accurate workpieces. These are predominantly in titanium as well as other exotic/hardened materials, and with tolerances within 0.2 mm, they are fit for nuclear engineering clients throughout the world."

The company has installed a Soraluca TA-A35 travelling table mill-bore centre and a Hankook VTC 200 E vertical turning lathe (VTL) boasting extensive machining capacities. The Hankook VTL has a 2,500 mm diameter table capable of accommodating workpieces of 2,000 mm diameter and weighing 12,000 kgs while the Soraluca mill-bore centre features 3,500 mm by 1,250 mm by 1,200 mm in the X-, Y- and Z-axis travels for components weighing up to 7,800 kgs.

Darren Sadler says: "Importantly, very few companies in supply chains outside of OEMs have a VTL of this size so we are very well positioned as a supplier to handle such large components."

He adds that the 28 kW Soraluca, with its 40-tool stations and 4,000 revs/min automatic indexing, in 2.5 degree increments, machining head represents an invaluable production asset. This is especially true when it comes to producing the PCD 'pattern' of holes on exchanger plates, which can vary from 13 mm to 16 mm diameter.

In addition, the Hankook VTL's specifications are particularly highlighted as



The 28 kW Soraluca is an invaluable production asset for TPG Engineering

Photo courtesy of: www.thisisdecoy.co.uk

attributes that will set TPG Engineering apart.

Darren Sadler explains: "These include a torque rating of 40 Nm, which is crucial when machining such high-grade materials, motors of 55 kW, table, 22 kW, for milling, 9 kW, C-axis and 7 kW, for the X-Z axes servo. There is also a 24-tool magazine, 12 each for turning and milling tools."

The two machines were supplied by its exclusive UK and Ireland agent, T W Ward CNC Machinery (Ward CNC) of Sheffield. They are sited in a specially-created advanced manufacturing centre at TPG Engineering's Greater Manchester base and, together with a large-capacity coordinate measuring machine that is enclosed in its own cleanroom, they represent an excellent facility for the manufacture of such parts.

The machines are complemented by the company's other manufacturing services, including fabrication and welding, as well as assembly, that are underpinned by continual improvements to existing manufacturing processes and systems.

Darren Sadler says: "We are moving

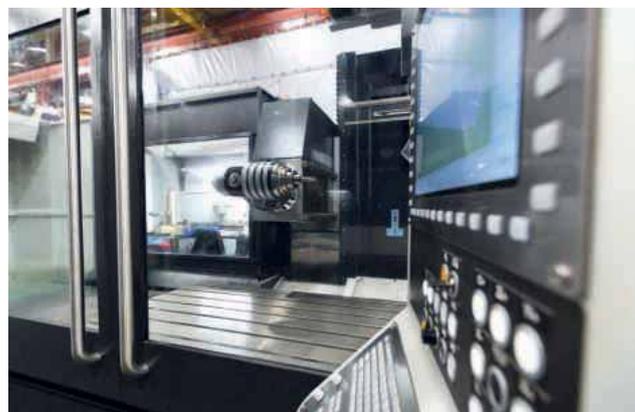


Photo courtesy of: www.thisisdecoy.co.uk

forward in two ways. Existing work can be elevated to new, higher levels due to the accuracies and tolerances achievable with these machines and the machines expansive work envelopes will also enable us to accommodate additional, larger workpieces."

With extensive experience in aerospace manufacturing, and aerospace design engineering, Darren Sadler joined the company with the remit to elevate TPG Engineering into a new era of effectively and efficiently machining large and often complex workpieces in hard-to-machine materials, and to high levels of accuracy.

Darren Sadler says: "TPG Engineering has an established history in the oil and gas

industries, and was ready to progress with existing customers and, crucially, to become a major player in the nuclear sector for larger capacity machining."

Working closely with the Nuclear AMRC, where trials on similar components were held, the Nuclear AMRC effectively acted as advisors on machines best suited to the challenging requirements.

TPG Engineering presented the Nuclear AMRC with specifications for a series of typical parts which require vertical turning, milling and boring. For maximum flexibility and agility, and to avoid potential production bottlenecks, two separate machines were suggested, a VTL and a mill-bore centre.

TPG Engineering soon found that Ward CNC could not only offer suitable machines but that its back-up service, support and applications engineering input was highly desirable, too.

Darren Sadler says: "The new machines and the Nuclear AMRC have also introduced us to new lessons in tooling and machining methods; in some cases, providing creative process solutions such as machining vertically rather than horizontally, to aid swarf removal.

"Also included here is the use of high-pressure, 70 bar, coolant on both machines, and the application of speeds and feeds that are different to the norm on certain components depending on material type and thickness. In addition, in some cases we'll be drilling up to 14 times diameter rather than the traditional eight times, while still maintaining the desired accuracies. The new machines are encouraging us to look at the complete manufacturing process and effectively re-define how we manufacture tube sheets."

First use of the machines is on the company's new two-year £1.5 million contract with GE Oil & Gas.

Darren Sadler says: "That the aim of TPG Engineering's advanced manufacturing centre is to "differentiate ourselves" by establishing a facility that enables even the most complex, heavyweight components be produced more quickly than ever and to meet demanding safety and quality standards."

Darren Sadler concludes: "These components will, by their nature, be processed in small batches, and we are uniquely positioned to be able to handle these in the most efficient way. Our



investment in the advanced manufacturing centre effectively future-proofs what we are doing."

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Simultaneous manufacturing for specialist steering

As part of ongoing efforts to invest in its manufacturing processes, steering column specialist, Pailton Engineering, has implemented a new Simultaneous Operation Horizontal Multi-Axis (SOHMAX) machine in its facility in Coventry. The machine, manufactured by Cambridge Dynamics in partnership with FANUC, is designed for manufacturers to machine both ends of shafts, rods, bars and axles simultaneously.

Pailton Engineering manufactures bespoke steering columns for specialist vehicles, including buses and coaches, utility vehicles and military vehicles. The implementation of the SOHMAX machine is part of an ongoing project to invest in machinery to increase productivity at Pailton Engineering.

The SOHMAX machine does the job of up to twelve CNC lathes and milling machines, in favour of one machining operation. The machine can reduce setup times and speed up production of moderately complex parts.

For Pailton Engineering, the machine will assist in the manufacture of parts for

commercial, construction, emergency service and military vehicles as well as components for bus and coach steering systems. SOHMAX hosts a central carousel, consisting of six beds that can accommodate components up to one metre in length. By indexing by sixty degrees after each movement, the machine allows for twelve machine operations during each cycle, without compromising on the accuracy needed for the automotive market.

Matt Fisher, production manager at Pailton Engineering, explains: "Our production facility may be extremely flexible, but not every steering system manufacturer is as flexible as us. Pailton Engineering prides itself on being completely customer focused and our attention to detail when manufacturing bespoke steering systems reflects this.

"The commercial vehicle industry often demands a fast prototype to production service, which is why we are continuing to invest in our state-of-the-art production facilities. Our facility is productivity focused and the implementation of the SOHMAX



machine is another way for us to meet the time sensitive needs of the industry, fulfilling customer demands and urgent orders."

Pailton Engineering designs, tests and manufactures world class steering systems. Using state-of-the-art CAD software and purpose build test facilities, the company creates purpose designed components to suit the exact requirements of the customer regardless of the vehicle type, size or application.

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Adding another string to its bow

The CNC Training Academy agrees deal to become UK and Irish distributor of Predator Software Systems

The CNC Training Academy, the independently-operated training division of Mills CNC, has announced that it has become the principal distributor of Predator machine monitoring and shop floor control technology software systems and solutions in the UK and Ireland.

The distributor agreement signed with US-based Predator Software Inc. in December 2017, will see the CNC Training Academy provide UK and Irish manufacturers with Predator hardware, software, systems training and after-sales service and support.

The Predator deal significantly increases the CNC Training Academy's portfolio of products and services. The Training Academy is recognised and highly regarded as the UK's premier CNC training organisation providing manufacturers, and individuals, with access to high-quality, professionally-delivered and competitively-priced FANUC, Siemens and Heidenhain Programmer and Operator training courses from its state-of-the-art training facility in Leamington.

In recent years the Academy has augmented this 'core business' by offering, at one end of the scale, a range of CNC beginners' courses, and, at the other, advanced and specialist courses for seasoned Programmers, that include NC Guide and FeatureCam.



Jeff Hart, The CNC Training Academy's training manager, says: "The CNC Training Academy has always had a strong focus on helping manufacturers get the most and the best from their machine tools and, by implication, their machining processes. Our comprehensive range of CNC training courses help manufacturers do that and the agreement to sell and support Predator Software systems is an extension of our business philosophy."

Predator Software Systems

US-based Predator Software Inc. is a market leader in designing and delivering shop floor automation, machine monitoring and networking solutions for a diverse and growing number of lean manufacturing companies worldwide.

The powerful Windows® based Predator software applications help manufacturers improve production efficiencies by giving them the tools to undertake real-time monitoring and analysis of their machines and manufacturing processes.

In addition, Predator solutions also provide manufacturers with the ability to accurately and securely capture, collate and analyse process data as a route to identifying production trends, good and bad practice, reasons for production bottlenecks, manufacturing inefficiencies and, generally, all areas requiring attention and improvement.

The full suite of Predator Software solutions also includes applications that focus on CNC Programming such as CNC verification, machine/process simulation, and fast and effective G-Code editing.

Together, Predator software solutions provide manufacturers with sophisticated and powerful control over shop floor operations, as well as the ability to network, gather and communicate shop floor data and sync it with their ERP and MRP systems.

A closer look

There are nine different Predator software systems currently available from Predator Software Inc, and the CNC Training Academy is, at this moment in time, offering the top four systems to customers. They can be purchased and used as stand-alone solutions in their own right or can be

supplied as an integrated package. The four systems on offer are:

Predator MDC (Manufacturing Data Collection)

Predator MDC software provides manufacturers with real-time machine monitoring and automatic data collection capabilities. The software enables manufacturers to track jobs, part production, machining and other operations, all and any human intervention, scrap volumes, machine downtime and status, OEE (Overall Equipment Effectiveness), and other KPI and performance metrics used to help in strategic decision making.

The software is supplied with an extensive library of different reports, charts and dashboard templates and configurations for manufacturers to use and customise.

Predator DNC (Direct Numerical Control)

Predator DNC software is flexible, efficient, secure and reliable. It allows manufacturers using different CNC and DNC networking configurations for their CNC machines, PLCs and robots to transfer programs, offsets and parameters simultaneously between their equipment by creating a common networking interface. It can be wired or wirelessly uploaded and downloaded via RS232, Ethernet or other parallel port interfaces. The software is powerful and supports up to 256 CNC machines, PLCs and/or robots per PC.

Predator Virtual CNC (Simulation and Verification)

Predator Virtual CNC software can be used with milling machines, lathes, mill-turn centres, EDM machines, lasers etc., to simulate machining processes offline. This facility enables manufacturers to check and verify processes before going into production and enables them to identify potential issues and problems in advance. Predator Virtual CNC can be used by manufacturers to optimise processes and helps them save time and money.

Predator CNC Editor

Predator CNC Editor software is a proven and popular 32-bit CNC code editor. It

includes hundreds of features that improve the day-to-day productivity of CNC programmers and allows manufacturers to fully exploit the potential of their machine tools. The software includes: CNC intelligent editing with Undo and Redo functionality; 3D back-plotting and verification of CNC code capability; File Compare' to correct G and M code discrepancies.

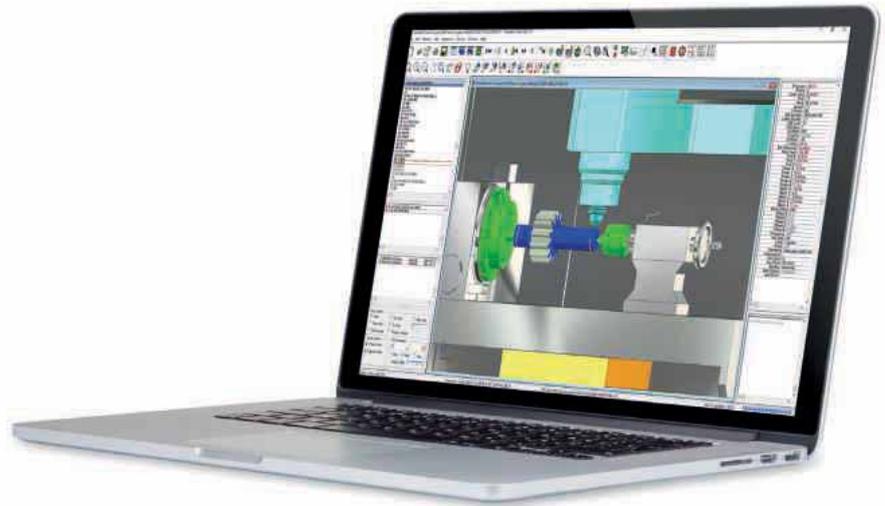
Predator Software and CNC Training Academy

Predator Software solutions are powerful management tools. To help manufacturers select the most appropriate Predator solutions, that meet immediate and future needs, the CNC Training Academy adopts a turnkey technical consultancy approach to sales.

This involves gaining, from the outset, a thorough understanding of every customer's manufacturing operation and processes, an appreciation of the range and type of machines and equipment used and agreement on the scope and scale of the Predator Software project.

Once a project plan has been designed and agreed with the customer, the designed

solution will be rigorously tested, trialled and proved-out. On-site installation of Predator hardware and software, by experienced CNC Training Academy service and applications engineers, then occurs with the Training Academy retaining responsibility for training and ongoing after-sales service and technical support.



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Making turrets terrific

Still using standard lathe tooling? It's time for a quick, but big change

As machine tools become increasingly complex and the need to produce parts in less time grows, CNC lathe owners and managers must look to the latest technologies if they're to improve shop floor efficiency. It is ironic then that one of the most productive of these solutions is far from new. In fact, it's been a champion in the war on machine tool downtime for nearly three decades. It's called KM™ Quick Change Tooling and, whether it's an old friend, a complete stranger, or an acquaintance you met briefly and discounted, it's time to take a long hard look at what it can do for your bottom line.

That's because Kennametal is changing the rules of quick-change once again. The Latrobe, PA tooling provider launches an entirely new KM product line: Turret Adapted Clamping Units. What's more, Kennametal has partnered with global lathe tool specialist, EWS Tool Technologies, to manufacture and support this series of KM adapters. Together, the two companies plan

to redefine how shops will tool up the turrets on their DMG Mori, Okuma, Mazak, Haas, Doosan, Nakamura, Hwacheon, and Hyundai lathes, with more to come.

Embracing change

Maybe you've looked at quick-change tooling in the past and said it's not for you. Too expensive, perhaps, or not worth the hassle that comes with implementing any new technology. That might be why an overwhelming majority of machine shops apparently choose to take the path of least resistance and use the standard turret tooling that came with their CNC lathe. Michael Schuffenhauer, tooling systems manager at Kennametal, says: "I spoke to a lot of customers, at the last IMTS and EMO exhibitions, and my best estimate is that 80 percent of them do not use a quick-change tooling system. I was very surprised, and, to me, it indicates a tremendous opportunity for these shops to become more competitive."



Turret adapted clamping units support this opportunity by replacing the standard block-style turret tooling with quick-change capable adapters made specifically for your brand of CNC lathe. This is true for both VDI and BMT-style turrets, whether they are rotating or static, and for toolholders with axial, radial, and even angular orientation. Suddenly quick-change is much easier to implement. Total tooling costs are reduced. Concerns over toolholder rigidity are eliminated.

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Remote controlled vibration damper for flexible deployment with deep drilling machinery

by Benjamin Röcker, sales director TIBO Tiefbohrtechnik GmbH

Vibrations generated during machining processes frequently have a major effect on process safety and can, in the worst-case scenario, result in the total failure of the tool. Notoriously, deep drilling processes are by no means immune to this effect. The greater the drill diameter, the more potentially extreme the associated vibrations, which can even be transferred to adjacent plant under certain conditions, where they can also affect the production process. In such cases it is advisable to decouple the machine tool foundations from the rest of the environment as is commonly practised in similar situations in relation to heavy duty pressing plant and other vibration generating machinery.

In deep drilling operations based on the BTA process, the required boring tube is also considered to be part of the tool. The boring tube is clamped in the drill spindle of the deep drilling machine and the actual tool, the drill head, is screwed onto the end of the tube with the usually single or quadruple start thread (or sometimes a flange connection). To create a deep drilling, the length of boring tube must be at least the nominal bore depth plus the machine-related length reduction. Accordingly, the greater the bore depth, the longer the boring tube required and, as function of the increasing longitudinal



elasticity of the tube, the greater the potential torsional and flexural vibrations. These vibrations need to be minimised as far as possible, as they have a direct effect on the drilling quality and on the operational life of the tool.

The objective

As a leading German manufacturer of deep drilling plant, TIBO Tiefbohrtechnik GmbH from Pfullingen in Baden-Württemberg

decided to tackle this issue. TIBO set itself the objective of analysing existing damping systems and using these findings in terms of improvement potential to develop a high-quality product of its own. TIBO's well-known modular construction method for deep drilling rigs represents another fundamental design principle adopted for their new vibration damping system for BTA deep drilling plant, which will also benefit from the development of modular and universally deployable components.

The purpose of the vibration damper

The vibration damper is designed to support the boring tube, to absorb the torsional and flexural vibrations arising during the drilling process and to dissipate them into the subsoil via the machine base. As a rule of thumb, the number of vibration dampers required, and their positioning, can be calculated using the formula $40 \times D$ (where D = diameter). This is the maximum distance at which a vibration damper must be positioned to support the boring tube in order to have a positive effect on the drilling process.

Construction types

In most modern deep drilling machinery, both the drilling tool with the boring tube



and the workpiece rotate in a counter motional manner. To this end, vibration dampers used in conjunction with a rotating tool need to be equipped with a roller bearing supported base frame. Within this base housing, a slotted damping cone is clamped to the boring tube by bracing it with bilaterally applied locking rings, which redirect the vibrations directly into the damping housing. Prior to starting the drilling process, the damping cone's defined pretension force is applied to the tube. In some cases, it may be necessary to adjust the tension force during the deep drilling operations due to a range of influences.

Generally speaking, there are two damping system types. In one, the damping cones are adjusted manually while the other type relies on a hydraulic or pneumatic control circuit. In manually operated dampers, the tension force is adjusted by hand using c-wrenches or hook spanners, which, under current safety regulations, is no longer permitted during operations in the case of new machines. Moreover, many of the damping systems currently available with hydraulic or pneumatic controls are extremely large and can only be deployed in a limited set of situations unless the

operator chooses to acquire them in a range of different sizes in order to be able to cover the desired spectrum of drill diameters.

Compact construction, easy to operate TIBO's newly developed vibration damper can be used to effectively pretension all commonly used boring tube diameters, which range from 11 to 382 mm. Special features of the system are a space-saving housing construction whilst covering an extensive range of drill diameters within a single frame size. The installed dimensions are oriented on those already established within the market, which are, to some extent, manufacturer independent. This enables the use of TIBO vibration dampers with third-party manufactured deep drilling machines with existing compressed air supplies. Additional oscillating weight can be easily affixed to the housing as required, and depending on the use case, to achieve even better damping properties. The pre-tensioning force is applied effortlessly via a proportional directional valve in conjunction with an ultra-sensitive precision controller, which also allows for precisely metered adjustments during the deep drilling operation. A touch panel display is also available for the new TIBO damping

machines, which provides graphic visualisation and regulation of the tension pressures of each individual damper.

Bi-directional deployment capability

Another benefit of these dampers is their bi-directional deployment capability. They can be used for both ramming operations, for example solid drilling, core drilling, reaming, decortication or skiving and roller burnishing and traction operations (extraction drilling), without having to go to the considerable effort of rotating the damper housing through 180° as is the case with other makes.

True to TIBO's corporate motto, "modular", our vibrational dampers are universally usable and their wide deployment range is a reflection of our flexible approach to the manufacture of deep drilling plant.

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Experience Tibo deep hole drilling machines.

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Performance.
Precision.

Innovative deep hole drilling technology, intelligently engineered from modular system components – that's what Tibo Tiefbohrtechnik is all about. Get to know our high-performance BTA and gundrilling machines and discover the amazing possibilities for your specific deep hole drilling applications.

Visit us at our headquarters and production site in Pfullingen, Germany or experience our website at www.tibo.com

Deep bores for the highest demands

Indexable insert single-lip drills are the trend, according to TBT

Even when deep drilling with single-lip drills, both when boring and drilling, the trend is towards tools with indexable inserts. The range of advantages is wide compared to brazed tools; with improvements in bore quality and performance especially.

For holes with depths starting at about 20 x D, single-lip drills are clearly superior to other drilling tools. The gradients are lower, the surfaces are a significantly better quality. These are important reasons why this type of tool is often also used for applications with less deep bores, but the highest quality requirements. Experts refer to this as "precision drilling." The quality can be increased even further if single-lip drills with indexable inserts are used. This fact often remains unknown, because indexable inserts are not nearly as common in deep drilling as, for example, in milling, turning or short hole drilling.

"Single-lip drills with indexable inserts have both performance and quality benefits," says Dr. Thomas Bruchhaus, tool expert at TBT Tiefbohrtechnik in Dettingen/Erms. "If only one of these aspects is important to the user, we recommend indexable inserts with single-lip drills. And this is happening more and more often, because the cost pressure and the demands on the quality of the cutters are constantly increasing."

While the quality of the bore is of less importance than machining time for cooling or lubricating bores in the field of mould making or the automotive industry, the plastics industry, for example, attaches great importance to extremely smooth surfaces. Both requirements can be fulfilled very well by the insert-type single-lip drill.

As a full-service provider for deep drilling, the experts at TBT have continued to expand their tool range in recent years. Single-lip drills with indexable inserts for full boring are currently available from a diameter of 12 mm. With small diameters, there is no space to clamp the indexable inserts and guide strips; as such, these are still manufactured exclusively with brazed cutting edges. Drilling with single-lip drills is a less common type of machining; the tools are almost always made by TBT according to customer requirements.

"In the meantime, we have been able to make many comparisons between single-lip drills with indexable inserts and brazed cutting edges being used by our customers and subcontractors. The feed rates are always higher, sometimes by a factor of 2 to 3, and the surfaces are better," continues Thomas Bruchhaus. "In addition to the cutting edges, the guide rails also contribute to their high quality, as they have the last contact with the bore. The rails are



WP-ELB series 10 drilling tool: The TBT indexable insert single-lip drills also include replaceable carbide guide rails to guide the tools in the bore. The strips additionally smooth the bore, which is why the best surfaces are created

also made of coated carbide and provide additional smoothing of the bore wall. In addition, it is possible to use underlays to finely adjust the diameter of the guide rails by hundredths"

The reason why indexable inserts cut better: unlike brazed blades, they have sintered chipformers that optimize chip formation. In conjunction with positive geometries, the cutting forces are reduced. Reserves are created to increase the feed rate or, with unchanged cutting data, to reduce the machine power. Sanding chipformers with brazed tools is only possible to a very limited extent and it is time-consuming. During the reconditioning of such cutting edges, the chipformers must be completely reground, so that a significant amount of material from the carbide cutting edges is lost and only a few regrinding cycles are possible at all.

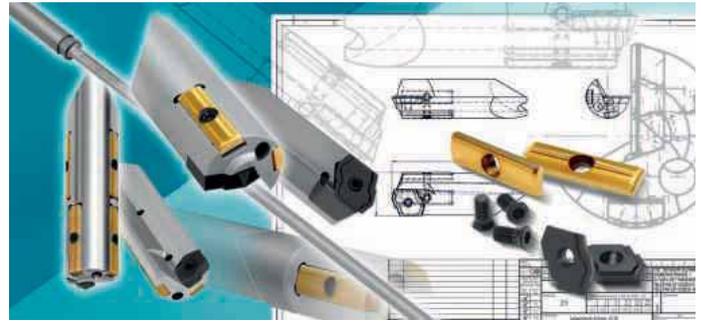
For the special case of drilling, the use of single-lip drills with brazed cutting edges is often limited due to chip breakage problems, which has to do with the low depth of cut. Indexable inserts are different. The positive chipformer geometries produce the desired short chips even at low



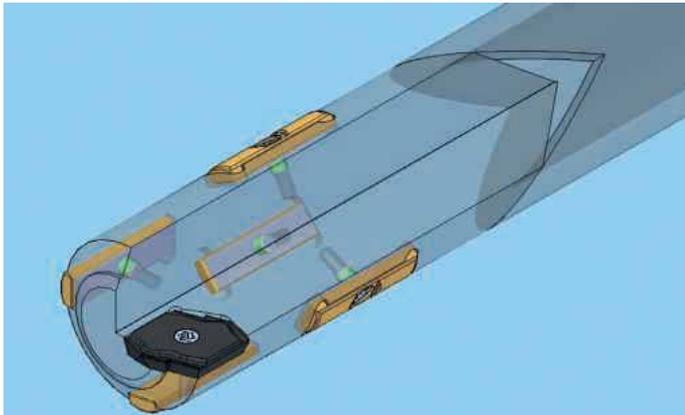
Dr. Thomas Bruchhaus, tool expert at TBT Tiefbohrtechnik, is convinced of the advantages of indexable insert tools in deep drilling

cutting depths, and this benefits the quality of the holes and process reliability. Furthermore, the combination of boring and drilling processes also offers great advantages in the production of stepped bores. If the machine power is too low to bore larger bore diameters, a drilling tool can be the solution. Other variants would be single-lip drills that combine boring and drilling in one tool. For special shapes of this kind, the versions with indexable inserts are always ahead.

Finally, the "softer" arguments are convincing: since tools with interchangeable blades do not have to be reground, they incur less running costs and are always available. Furthermore, many auxiliary



TBT supplies indexable insert single-lip drilling tools with diameters from 12 to 28 mm. For cross-drilling, there are also variants with a long head



Indexable inserts also increase the quality of the bore in single-lip drills, as well as process reliability. TBT produces drilling tools according to customer requirements

and setup times are reduced. In the case of wear, the machine operator does not need to take the complete tool out of the machine; the cutting edge can be changed on the machine. In addition, a brazed tool becomes shorter after regrinding, which may necessitate adjustments in the NC program. With indexable insert tools, on the other hand, the machine operator can continue working right away. Last but not least, the use of different carbide types and geometries makes targeted process adaptation possible, so that the user can ultimately get by with fewer tools and saves further costs.

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Mollart captures international orders for gundrills worth £5 million in April

Mollart Engineering's deep hole drilling expertise has captured international orders worth over £5 million which has set the company well into its machine tool build programme for 2018-19. These main orders, taken in April, are from existing North American and Chinese customers and have all been won against strong European and US competitors, largely based on existing track records of previous applications and proven installations.

Ian Petitt, managing director, says: "We were judged against most major competitors in our sector. However, what became a major factor in each of the orders won was the proven overall machine reliability of Mollart's installations and utilisation that has been maintained over extended periods of time. Our reputation for application development and levels of productivity aided by our German specialist tooling partner Botek were also important factors."

An order from one of the largest independent automotive manufacturers in North America, worth some £2.5 million, will

see Mollart supply four special purpose 4- and 6-spindle gundrilling centres for producing oil galleries in transmission shafts used in the latest generation of fuel efficient 9- and 10-speed gearboxes. Ian Petitt says:

"We have now installed 31 gundrilling machines with this company with some being repeat orders and others involving specialist application engineering."

Mollart's first order from the customer, worth almost £10 million, was placed in 2014 at the IMTS exhibition in Chicago.

A further US order taken by Mollart is for a Prismabore PRB 25 6-axis combination gundrilling and machining centre. The machine is to be used for the deep hole drilling of cooling holes in steel moulds at a US mould specialist. The machine has a 'single-cycle' capability to perform conventional drilling, counterboring, milling, tapping and thread milling processes. Significant in the specification of the hybrid-type machine design is the use of a heavy-duty CAT-50 spindle and the added flexibility provided by its 90-tool magazine.

Bringing the success of its gundrilling



installations in the fuel injection sector in China to 60, Mollart has orders for a further two-spindle Drillsprint LD2-750 machines to drill holes between 7 mm and 10 mm diameter, by 600 mm deep, in forged alloy steel diesel fuel rails. The Drillsprint series of machines has proven to be central in several customer programmes for producing fuel injection equipment across Europe and Asia.

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A brief guide to trepanning

by Andrea Rodney, director of Hone-All Precision Ltd

Trepanning is basically deep hole boring with a difference in that it leaves a core. It is an efficient method for drilling large deep holes that is more cost-effective than deep hole boring.

The most common use for trepanning is cutting a core out of a larger solid, leaving two pieces. The removed material is not reduced to swarf as with drilling but remains a solid billet. The most common example is a solid billet that is left with a hole bored through from end to end and a second smaller round bar that is excised by cutting around it. It can be intended as a roughing operation, destined to be machined further or honed to a finer finish. Alternatively, trepanning alone is sometimes adequate for the job in hand. In fact, people often ask for trepanning when all they want is a deep hole or process bore.

Trepanning can also be used on surfaces such as on solid rods or cylinders, or sheet metal. Instead of drilling all the way through, it can be used to create grooves for O rings or recessed mounting slots.

Advantages of trepanning over drilling

Trepanning tools can either remove a solid core or the outer sleeve of a billet in less time than conventional machining methods. They require less energy than boring tools because cutting out a cylinder takes less time than drilling as the bulk of the stock is not converted into swarf but left intact. Trepanning tools use indexable tooling, which makes them very efficient and

productive when processing different jobs in quick succession. Trepanning is often used for creating large diameter holes, usually deeper than one hundred times the diameter. The rationale for choosing trepanning is often one of these:

A standard boring head is either not economical or available.

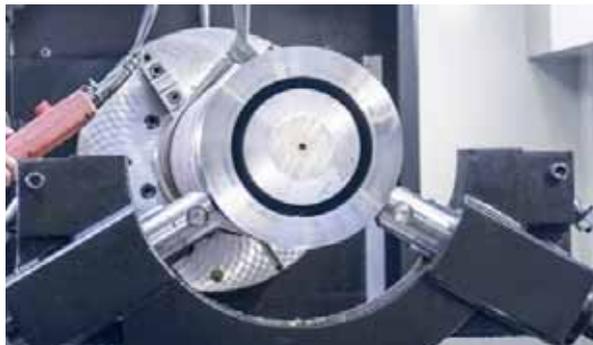
The customer specifies the return of a solid core either for maximising scrap values or for reuse. However, this billet would require recertifying and treating if full traceability is required as the certificate would no longer reflect the description of the material.

Bore diameter is greater than 100 mm typically.

Expensive metals, such as titanium or super alloys are required.

The cutting process

The cutting system is like the BTA drilling single tube system, but it requires less energy to power the spindle because trepanning cuts less material as it rotates. The feed is typically ballscrew or rack and pinion. Trepanning tools use carbide indexable tooling heads, which are hollow in the centre with peripheral tips and



high-pressure coolant and lubricant. The cutting head is sealed against the end of the workpiece by a pressure head at one end and the chuck at the other.

As cutting progresses, the coolant flow pressure removes the swarf by forcing it into the conveyor and the coolant is recycled through the retaining tank. The head and shaft gradually become supported by the bore until it reaches the end of the billet at which point the core can be removed. Load monitoring is commonly used to alert the operator to potential issues during the operation as the cutting edge is invisible for the duration.

Trepanning is often the first step in producing a part to customer specification. It may be followed by additional machining such as counter-boring or honing. Our engineers here at Hone-All pride themselves in delivering all orders to aerospace standards irrelevant of use or quality requirement. That means you are guaranteed the finest engineered parts. We invite requests to discuss subcontracting requirements, especially for businesses that prize extreme precision and supreme quality.

You can request a quote from Hone-All for any specific job that you have in mind. Quotes are free and quite often initiate a discussion about approach and technique that may lead you to rethink some aspects of your specification.

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Deep hole boring and performance superfinishing

Specialising in gundrilling, deep-hole boring, CNC turning, honing, CNC grinding and super-finishing, Perfect Bore Manufacturing is continuously investing to keep pace with customers exacting requirements. Fintek offers a full range of deburring, edge radiusing, fine grinding, smoothing, polishing and performance superfinishing subcontract services.

A £1 million investment in a CNC/Prismatic drilling division, allows Perfect Bore to drill multiple holes in various shaped blocks and offset holes in round billets. These machines can provide cost-effective solutions to drilling holes in mould tools for high-end automotive applications, manifolds for oil and gas tool applications and plates for nuclear fabrications. With AS9100, ISO14001 and OHSAS18000, the company is also a partner within the Fit for Nuclear programme. In addition, the firm provides bore solutions for major OEMs with approvals from clients including Airbus, BAe, Goodrich Actuation Systems, Boeing, Moog and Rolls Royce.

Fintek also works to the highest quality standards AS9100 and ISO9001. Clients include major aerospace component manufacturers, motorsport including top-level F1, medical device implants and prosthesis, pharmaceutical, toolmaking and other high precision industries.

Jonathan Dean, MD of Fintek, says: "Our capability to achieve a micro surface finish to Ra 0.01 μm helps component manufacturers to meet their customer expectations for wear parts that reduce friction, generate less heat and are more durable. Improved surface finishes are also providing a much better base for subsequent hard coating processes,"

Hard to reach burrs, hard coating droplets, brittle edges, extremely thin and fragile parts all present challenges to manufacturers. Fintek has the know-how and applies the latest finishing techniques and machines from OTEC Präzisionsfinish GmbH to these problems. Multiple finishes are easily achieved in a single cycle, saving even more time and therefore money. Typically, a part can be deburred, edge rounded, smoothed and polished in a one process cycle.

Fintek, formerly Finishing Techniques, has brought together workpiece superfinishing methods into a one-stop shop for precision engineers. It is the official UK agent for leading German-made OTEC mass finishing and super finishing equipment. For more than 30 years the company has helped its customers in aerospace, motor sport, medical device and other precision industries to improve quality, repeatability and finishing productivity.

Perfect Bore works with major OEMs and sub-tier companies operating in market sectors including the aerospace, oil & gas, nuclear, scientific instruments/medical, automotive and power generation industries. The company operates a fully accredited integrated management system that is compliant to AS9100:2016, ISO 14001:2015 and BS 18001:2007. It also offers research and development for one-off prototypes and a dedicated manufacturing facility to produce high-quality parts to exacting tolerances. It is a bronze awarded signatory to SC21 and is also a signatory to both Fit For Nuclear (F4N) and the NDA's Supply Chain Charter for nuclear decommissioning sites.



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With the knowledge and extensive experience of over 30 years, **Subcon Drilling** continually provides a professional and personal approach with total dedication to quality to a list of long serving clients.

Our BS EN ISO9001:2015 Quality Management System is an integral part of our business. Focused on quality, **Subcon Drilling** is recognised as the leading Gun drilling and specialist machining provider in the U.K., continually meeting and exceeding our customer's demands.

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Alitech races to success with ITC

As a subcontract motorsport machine shop, Alitech Precision Ltd is a company that is rapidly evolving and this is credit to its aggressive investment programme, enthusiasm and love for all things motorsport.

Since its inception a little over three years ago, the Silverstone Company has purchased three HAAS machining centres, OPEN MIND CAM software, a simultaneous 5-axis Spinner machining centre and cutting tools from Industrial Tooling Corporation (ITC). Like any subcontract business in its infancy, the team at Alitech Precision has acquired its machine tools and peripheral equipment based on expert advice, trial and error, conferring with customers and competitors alike and personal experiences.

It is these factors, among others, that led the Northamptonshire business to implement hyperMILL CAM software, the Spinner U-620 5-axis machine and solid carbide cutting tools from ITC. While the 'design to manufacture' subcontractor utilises cutting tools from a variety of suppliers, it is Tamworth based ITC that has stood out for special tools and end mills for machining steel components.

The relationship between Alitech and ITC started just over 18 months ago when the Alitech team encountered tool life and performance issues with an existing tooling



vendor when machining steel. The Alitech engineers were exercising a 'trial and error' process that was proving fruitless. Alitech picked up the phone to ITC and local ITC engineer Gary Bambrick was immediately on-hand to advise.

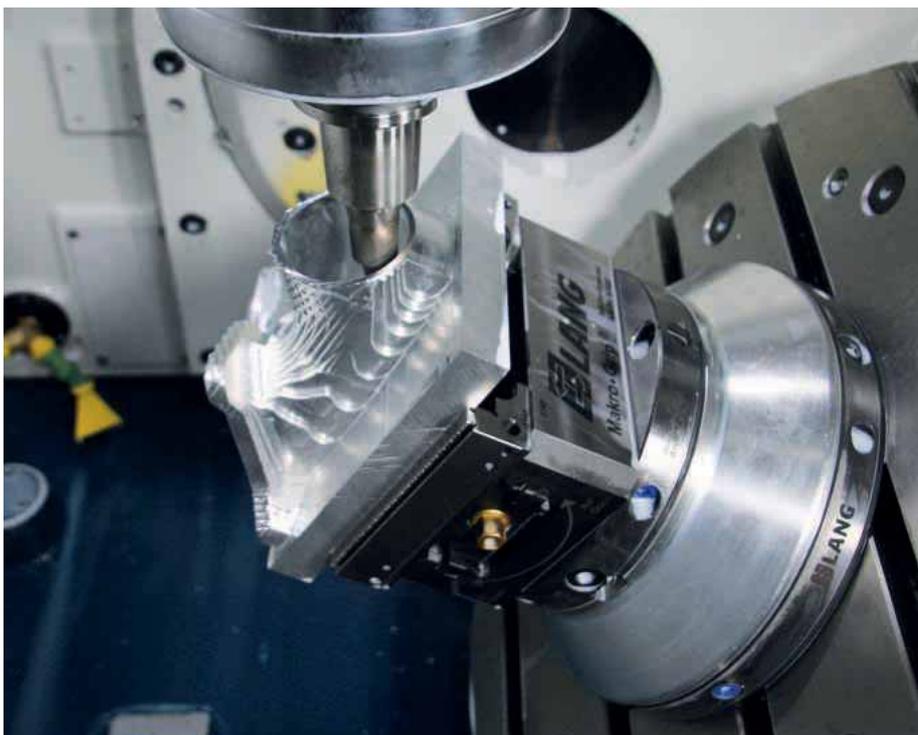
Despite the company name being a major clue to the fact that Alitech primarily undertakes aluminium machining, the Motorsport Valley subby frequently produces towing eyes for race cars and bonding brackets for CFRP from EN24 steel. Commenting upon the intervention of ITC, Alitech Precision senior 5-axis programmer, Charlie Watts says: "An ITC engineer came in and trialled the four flute 4081 Cyber Series of solid carbide end mills. The results

were remarkable. After undertaking so many trials with a multitude of cutting tool suppliers, we were always going to be a little sceptical of any tooling engineer that came through the door. However, Gary Bambrick offered a level of expertise and advice that included intuitively optimising the speed and feed parameters of the 4081 Series. This delivered really impressive results."

Since the initial trial success, Alitech has now widely implemented the ITC 4081 Series for steel jobs and titanium parts, purchasing 4, 6, 8, 10, 12, 16 and 20 mm diameter end mills. The 4081 Series is an AlTiN coated four flute solid carbide end mill with a harmonic flute geometry that provides excellent swarf evacuation. This is credit to the radical unequal spacing on right hand helix flutes that deliver exceptional stability and metal removal rates. Whilst the flute spacing of the 4081 Series significantly reduces machining noise by eliminating the harmonic effect, it is the small corner radius, innovative geometry design and sub-micron grade carbide composition that makes the 4081 Series a leading tool for the efficient machine of difficult to cut steels and titanium alloys.

With regard to machining performance on aluminium, Alitech is more than happy with its existing vendors. However, when it came to the profile machining of deep port pockets, it was ITC that stepped up to the challenge with its industry leading lollipop cutters. The majority of projects undertaken by Alitech involve the complex simultaneous 5-axis machining of parts such as billet inlet manifolds, valve seats, inlet port heads, billet turbo manifolds and much more. Reaching deep into ports is a complex challenge for the machine tool kinematics, the CAM software, the cutting tools and toolholding. At the sharp edge is the ITC 4101 Series of lollipop end mills that permit Alitech to reach surfaces around corners and deep inside manifold ports.

Commenting upon the daily challenges at Alitech, managing director, Darren Cudd says: "We recently machined a billet turbo manifold for a motorsport customer that required two 40 mm diameter oval shaped port holes with a curved machining depth beyond 200 mm. We used an 8 mm diameter ITC lollipop cutter, necked to 5 mm, that was protruding 70 mm out of a slim 80 mm heat-shrink toolholder extension



with a 75 mm long back-end configuration. The first concern is the collision detection when machining inside deep bores. The second issue on this job was whether we would achieve the desired surface finish with such a long tool protrusion. However, the rigidity and geometry of the ITC lollipop tools ensure we attain an exceptional surface finish whilst machining at extremely productive speed and feed parameters."

At present, the Silverstone subcontractor is collaborating with a high-performance tuning company to increase the power of an Audi RS6 to upwards of 1000 bhp. To achieve this monstrous power level, Alitech is manufacturing new intake manifolds that are central components to a full intercooler conversion. To machine the manifolds with impeccable precision levels and surface finishes, Alitech has once again deployed the ITC 4101 Series 12 mm diameter lollipop tools.

Darren Cudd concludes: "We have applied the 12 mm diameter lollipop tool for 'back cutting' around corners on the 6082 grade aluminium manifold ports. The shank of the 12 mm diameter ITC lollipop tool has been necked to 8 mm diameter to permit maximum reach and flexibility whilst



ensuring sufficient rigidity for optimal surface finishes. The result is that we are running the spindle of our Spinner at 12,000 rpm with an 8m/min feed with a 0.5 mm step-over. Machining at these parameters generates the ideal balance of material removal, surface finish and tool life. In fact, we are using the ITC lollipop tools for all our aluminium porting and the 12 mm tool we are using at present has been

running for over five months. We have hit a few hundred hours of machining with the ITC lollipop tools and they still perform as well as they did when they were first installed."

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Tangentially mounted inserts add greater versatility

Sliding head users gain from WNT innovation

WNT's System SOGX series of turning inserts and toolholders combine to provide users with four useable cutting edges. In addition to maximising the number of cutting edges by tangentially mounting the inserts, an extremely stable process is ensured even under extreme cutting conditions. This is further enhanced by the availability of a coolant supply that can be precisely directed and fed from either the rear or side of the toolholder.

By mounting the inserts tangentially in the holder machining stability is increased significantly and, with the design of the insert and seat, makes available four useable cutting edges to maximise productivity and reduce tooling costs. The SOGX-style inserts are available in two sizes, 7 and 11 mm, each with a choice of tool coating options. WPX7630 is coated tough grade for general use and the WUX7620 is a harder, uncoated grade used for non-ferrous materials and titanium. The design of the inserts presents a sharp cutting edge to the

workpiece, which assists in reducing cutting pressures, with the precision manufacture of the insert also enhancing accuracy and repeatability.

Further benefits of the insert geometry, and seating location, is that the SOGX inserts can produce a square shoulder. This eliminates the need for secondary operations that may be required with other styles of sliding head turning tools. At the same time cutting depths are increased, with a maximum depth equivalent to 50 percent of the insert size, so 3.5 mm and 5.5 mm respectively, meaning fewer passes to remove material therefore shorter cycle times.

Tony Pennington, managing director, concludes: "The SOGX series of inserts, and associated toolholders, are part of our comprehensive and dedicated sliding head tooling catalogue containing over 11,000 items, almost half of which are brand new products in the WNT range. Putting all of our sliding head tooling into a single



catalogue simplifies the selection process for customers, who can be assured that everything in the catalogue will be subject to our same levels of service. If ordered before 6:30 pm it will be delivered the following morning."

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GW grooving and parting-off series

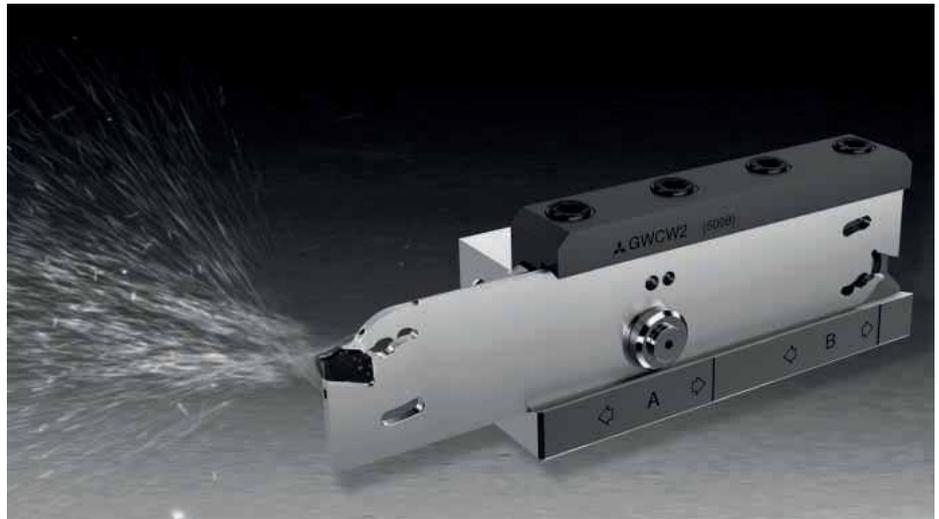
Mitsubishi Materials' extensive range of high-quality turning tools has been expanded to include the brand-new GW series of grooving and parting-off tools.

Simple and efficient

Pre-requisite high-quality and performance were the benchmarks defined during the design phase of the new GW series. The simplicity was taken care of by using the tool blade itself to clamp the insert without any screws. By using a unique wrench, it is possible to remove and replace the insert with one simple action, thereby making it efficient for everyday use in the workshop. Added security and rigidity is provided by the reverse taper geometry that prevents extraction during machining. The design also incorporates three large convex location faces for precise insert location repeatability, and in combination with a small location key, gives provision for increased reliability during machining.

Double through coolant holes

Two through coolant holes positioned close to the cutting edge simultaneously supply cutting fluid to the rake and flank faces. This provides effective cooling and lubrication for increased wear resistance that, in turn, provides the end-user with longer tool life and lower costs. Up to 7MPa coolant



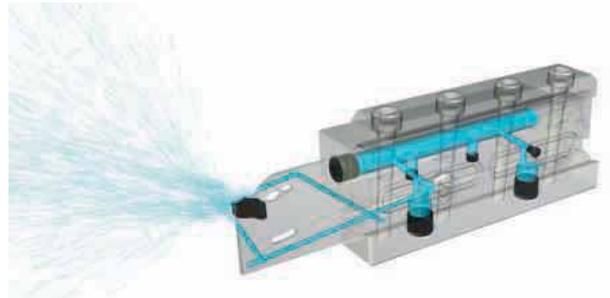
pressure can be used to provide the best conditions for reducing heat generation.

Flexibility

There are six coolant ports on the tool block, facilitating easy input configuration for the coolant. Further flexibility and ease-of-use is provided by the elongated coolant outlet that feeds into the blade. The overhang length is also easily set by using the simple scale etched onto the blade. A wide range of overhang settings within the zone, clearly marked on the tool block and blade, can be fed with coolant via the elongated supply ports.

Performance and reliability

A range of applications and materials from alloy and stainless steels, plus cast irons through to difficult-to-cut materials are covered by six of Mitsubishi's high-tech coated grades. The versatile PVD coated VP20RT inserts are highly versatile and suitable for multi material use, thereby



saving on inventory costs. Other grades, such as the MY5015, are for steels as well as cast iron machining up to 300 m/min, whilst the VP10RT grade covers the harder range of steels, stainless steels, heat resistant and titanium alloys. Two different chipbreakers are offered, the GS type for both parting off and grooving, plus the GM type that specialises in high performance parting off. All inserts are available in widths from 2 mm to 5 mm.

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Balloon goes up on UK made threaded inserts

Sales at Bridgnorth-based threaded insert manufacturer Fitsco have been high this year but have now, quite literally, gone stratospheric.

A recent application has seen Fitsco's class-leading Screwfit brass inserts for plastics used as part of a project that takes UK launched near-space craft clean through the troposphere and into the stratosphere, upwards of 40 km, where air pressure is less than one percent of that at ground level and temperatures drop below -60°C. This is even higher than the 85,000' which the once top-secret Lockheed SR71 Blackbird is stated to have flown at.

The balloon programme is the brainchild of former Sheffield University Engineering PhD students Alex Baker and Chris Rose who decided on a grand challenge, for themselves, to see if they could take a picture of the earth from the edge of space. Thus, their business, Sent Into Space, was born and has since become one of the UK's most interesting and innovative technology-based businesses to have emerged over recent years. The company

has already established a reputation as a leader in making the use of near-space and its further exploration an almost daily occurrence.

Sent Into Space designs, manufactures, launches and recovers special balloon payloads which ascend high above the earth into near-space, taking with them anything from cameras and scientific experiments to instantly recognisable brand images carried aloft for a number of household names.

Alongside its commercial arms, special programmes such as Classtronauts allow schools and universities to launch packages into near space, at an affordable cost, as key learning, research and testing opportunities. The programmes are said to provide unrivalled hands-on involvement for all participants and launches have proved especially popular in the education sector with Junior schools from across the country benefiting from successful projects with Sent into Space.

Although the specific application of Fitsco's threaded inserts are a closely guarded secret on the Sent into Space



programme, its use is clearly a matter of some gravity to Fitsco, which has been supplying leading OEMs and innovators with quality British-made inserts for almost 30 years.

So next time an engineer asks: "What on earth is that?" the answer may well be beamed down via a live link from a Sent into Space balloon payload featuring Fitsco Industries Screwfit threaded inserts.

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Irregular surface drilling is a formality with new Rainford Precision drills

Rainford Precision has now extended its already impressive drilling range with the arrival of the new UTDF 2-fluted carbide coated flat bottom drilling line from Union Tool. The flat-bottomed drilling range has been added to the Rainford Precision armoury to provide a drilling solution for angular, radial and other irregular surfaces.

The impressive new solid carbide drilling range is available in diameters from 2 mm to 12 mm with plus sizes offered for drilling pre-thread holes for M4, M6, M8, M10 and M12 threads. As with all tools from the Union Tool brand, the new UTDF drills are manufactured from a high-quality solid carbide composition with a precision ground shank and Union Tool's latest generation coating technology that extends tool life and performance.

Added to this, the new UTDF drills has a flat-land and 30-degree helix angle that combine to provide a robust geometry design that generates exceptional chip removal and stability. This results in highly-efficient drilling cycles and prolonged tool life on a range of materials that includes alloyed, structural, pre-hardened and carbon steels as well as cast iron and aluminium alloys.

The new UTDF drills have also been developed with an innovative web-thinning design and double margin that both enhance performance with regard to swarf evacuation, edge sharpness and stability. Depending upon selected diameter sizes, the UTDF drills have an overall length from 50 mm to 100 mm and flute lengths from 8 mm to 48 mm. For more information on the performance characteristics of these exciting new drills, please contact Rainford Precision.

For over 25 years Rainford Precision Machines has supplied precision tooling of the highest quality to the precision engineering industry, forming strong relationships with suppliers and clients alike. Its principals have been carefully selected to ensure that the best product for the job is used by customers and the search for excellence has taken the company worldwide. From Switzerland, Louis Belet, Delmeco, Xactform and Friedrich Gloor, from Germany, the renowned boring tool manufacturer Hobe and finally, from Japan, Union Tool and Iwata. Each company is able to provide the highest quality of cutting tool.

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Cut costs and boost productivity with new thread forming tap

Faster machining times, chip-free tapping, fewer stoppages

Cutting tool and tooling system specialist Sandvik Coromant has launched a new thread forming tap optimised for ISO P steel machining which is designed to boost productivity, particularly in the automotive industry. The CoroTap® 400 achieves this by offering chip-free tapping as well as faster machining times and stronger threads through reduced torque and an optimised geometry.

The automotive industry has extremely high requirements when it comes to safeguarding quality and it has implemented robust and rigorous processes for this reason. The new tap has been created to meet those exacting demands by ensuring superior thread quality, improved process security and longer tool life, resulting in a combination of greater efficiency and reduced costs. In comparison tests, the CoroTap 400 delivered a significantly more secure and stable tap than its competitors while achieving cutting speeds up to 50 percent faster.

Among the main features of the new tap is an optimised lobe profile designed specifically for ISO P applications. By increasing the number of lobes on the tap and giving it a shorter thread length, Sandvik Coromant has reduced torque at the machine tool spindle which facilitates increased cutting speeds and, in turn, improves productivity. As a result, the CoroTap 400 offers the customer such key benefits as greater process security, fewer machine stoppages, reduced cost per hole and improved tool life for better process planning.

Made with a new grade of substrate and



coating, the new thread forming tap gives machine tool operators peace of mind through its high-level reliability and its adaptability for use with lower torque spindle machines. For senior managers in the automotive industry, the tap satisfies their green light machining demands while extremely high levels of repeatability and predictability afford them extra confidence in relation to maintaining the highest possible production standards.

Offering a more consistent and reliable threading process, the CoroTap 400 has been designed with a geometry that can reduce the force required for machining a steel component by up to 30 percent. At the same time, the tap's working life can be up to twice as long as similar thread forming tools.

Designed to be used on steels up to 330 HB in conjunction with such drills as Sandvik Coromant's CoroDrill 860, the new tap is ideal for machining such automotive components as connecting rods, wheel hubs, crank shafts, axles, gears and transmissions. Not restricted to the automotive industry, however, the CoroTap 400 is also perfectly suited to rail or general engineering applications, where it can improve productivity and cut costs when forming threads in rail wheels, flanges, rivets, housings, boom cylinders, tubes and a wide range of other components.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3,100 patents worldwide, employs over 7,900 staff, and is represented in 150 countries.



Today, Sandvik Coromant is a leading supplier of tools and know-how to the metalworking industry. Throughout the years, it has contributed to the industry with new products, solutions and methods that have improved processes and ways of thinking. Together with customers, the company develops tooling solutions and machining knowledge that change, lead and drive the future of manufacturing.

Sandvik Coromant is a member of the Advanced Manufacturing Research Centre (AMRC) in the UK, working with the centre's partners: Boeing, Rolls-Royce and the University of Sheffield. Sandvik Coromant has also partnered with the Commonwealth Centre for advanced Manufacturing as one of its originating industry members, as well as the Connecticut Centre for Advanced Technology and the Manufacturing Technology Centre in the United States.

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Diversity draws the crowds for Floyd

The 2018 MACH exhibition was a roaring success for Floyd Automatic with the Baldock-based sliding head tooling experts claiming that it was the diversity of its collets, guide bushes, indexable tooling ranges and the application expertise that sent small turned parts manufacturers directly to the distinctive orange stand.

The extensive turning lines from Applitec and the sheer diversity of its portfolio, were certainly points of note. Providing his feedback on yet another successful MACH exhibition, Floyd Automatic Tooling managing director, Richard Floyd says: "We generated more enquiries at MACH than at



many of the previous events and what stood-out for us was the high enquiry level from both new customers and overseas clients too.

"The high level of new enquiries is partially down to more subcontractors embracing the benefits of sliding head technology whilst the overseas lead generation can be largely attributed to language barriers and a reluctance to engage in technical dialogue when English isn't your first language.

"We also invested in the Pokem technology at MACH with eight contact points that enabled us to identify what product lines generated the greater interest at the show."

From the Pokem technology utilised at MACH, Floyd Automatic noted a high level of interest in the new Masa Microconic sub spindle collets. Precise and stable clamping of small workpieces, in the sub-spindles of sliding head machines, has long been an issue for turned part manufacturers. This is now solved by the revolutionary precision workholding system.

The Microconic over-grip collet system consists of a cartridge and precision collet. The over-grip collet fits inside a cartridge and is accurately adjusted before it is fitted directly into the existing collet sleeve with no machine adaptations required. The patented over-grip collets can open up to 4 mm larger than the clamping diameter and also incorporate an ejection guide sleeve blank. This helps the end-user to solve the difficulty of ejecting parts from the collets after machining. For manufacturers of high-precision parts in the connector, medical and electronics sector, the Microconic over-grip collet system was a great find.

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Guhring's PCD tooling division relies on Vollmer technology

In June last year, Guhring officially opened its new 60,000 sq ft £12 m manufacturing facility on Birmingham's advanced manufacturing hub. The new UK headquarters of the German-owned cutting tool manufacturer was a necessity for the company to fulfil its future UK growth ambitions.

For the previous three years, growth had been constrained by the company being located on two separate sites that were crammed to capacity with manufacturing equipment. Despite the space constraints, it was two Vollmer PCD erosion machines that had proven integral to the success of the PCD tooling department, running efficiently and productively to keep Guhring ahead of its increasing order book.



In the 12 months since moving to the new facility, Guhring has increased staff numbers by 15 percent, taking on apprentices in the process. What is more pertinent is that Guhring UK previously manufactured 35 percent of its solid carbide and PCD product lines in the UK with the remaining 65 percent imported from Germany. Since the factory move, this ratio has increased to 50 percent UK manufactured. Standard product lines and a small quantity of application specific tooling are imported from Germany, however, January 2018 proved a landmark month with UK manufactured special tooling sales outstripping standard product sales for the first time in Guhring UK's 40-year history.

The UK manufacturing and re-grinding divisions of the business have seen sales soar since the move to the new factory. Additionally, the installation of a second coating plant has further underpinned the company's strong sales performance. Integral to the success of the PCD tooling division at Guhring is its Vollmer QWD750 and QWD750H wire erosion machines.

Guhring UK's national sales manager,



Dave Hudson says: "The Guhring manufacturing plant runs 3-shifts for 5 ½ days a week whilst the automation level of the Vollmer machines in the PCD department only requires 2-shifts per day. This labour saving is credit to the Vollmer machines and our lean manufacturing processes and workflow scheduling.

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A wide range of new and enhanced products from Leader

As one of the UK and Ireland's premier workholding and manufacturing ancillary specialists, the Leader Chuck International stand at MACH 2018 featured an engineering cornucopia of new and enhanced products specifically developed and selected to improve the efficiency, productivity and accuracy of just about any machine shop.

Managing director, Mark Jones explains: "While some of the products we support are straightforward, requiring no services to demonstrate their capabilities, others demand compressed air, electricity or both. Visitors to the show could witness the potential benefits available from our product partners when combined with the comprehensive fixturing knowledge available from Leader staff.

"For example, freeze clamping plates from the world's leading specialist AMCC have proven to be an excellent alternative to magnetic fixtures of non-metallic and non-magnetic components. Visitors were able to see the plates in action as it is the only way to fully appreciate the holding strength available with ice."

Autogrip's range of through-bore and closed centre standard and long stroke 1-, 2-, 3-, 4- and 6-jaw power chucks are designed to operate at up to 8,000 rpm, while the Lexair Tri-Grip collet closer is designed for use on either vertical or



horizontal machining centres, to maximise the raw material loading capacity.

Extending the capability of any machining centre is Exact Machinery's range of precision CNC rotary tables and indexing units. This range of CNC tilt and turn rotary tables features high rotational torque, dynamic accuracy and easy installation and maintenance.

New products in the Leader portfolio include a line-up of small self-contained pneumatic jaw and collet chucks from Jato and an extensive range of dynamic balancing and monitoring solutions from Italian specialists Balance Systems. The dynamic display was crowned by the ZeroClamp zero-point clamping system that represents the foundation of all the automation products being offered by Leader.

A new partner for Leader, being shown for the first time in the UK at MACH, OMIL is specialist supplier of automation and robot components. Its wide range of products allows the company to operate in a range of key sectors, including machine tools, assembly machines, transfer machines, gantry-robots and in the general mechanical and electromechanical engineering industry.

Static but fully functioning vices from OrangeVice, Homge and PiranhaClamp are also available, the latter offering unbeatable clamping force characteristics with the spindle able to withstand well above 1,300 Nm², with only 3 mm clamping depth, open construction for chip removal, extremely low height and no pre-stamping required. Added to these is the CARVEsmart Quick Change Vice Jaw System that has been developed to simplify setups for production and toolroom vices.

A superlative range of world-leading quick-change collet chucks and mandrels from Hainbuch have been available from Leader for nearly 25 years and featured



alongside the Hewa range of 2-jaw self-centring indexing chucks, Maprox high precision collet chucks and miniature multi-jaw chucks for watchmakers and metrology applications, as well as MicroCentric high accuracy air and diaphragm chucks. Designed for the converting and paper industries, core chucks were the focus for Panzeri, and examples of its lug-type, axial and torque-activated as well as pneumomechanical chucks were on show.

Turin-based tailor-made workholding and component manipulation specialist, Rotomors' capabilities were also highlighted, as Leader exclusively offers these solutions to manufacturing and precision engineering companies in the UK and Eire.

Innovating products, technologies and magnetic systems focused on safety and time efficiency were offered for grinding, milling and turning applications by magnetic fixturing specialist Walmag.

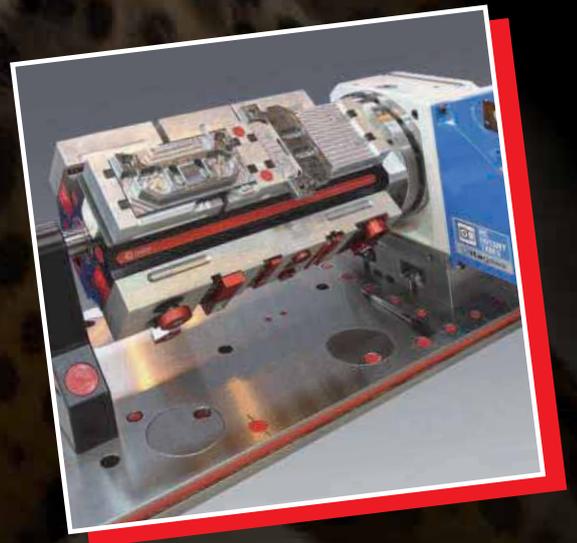
Supporting workshop accuracy and efficiency, the RotoRi range of chuck jaw boring rings can precisely aid the 'truing' of jaws fitted to manual or power chucks. The RotoRi sets have been specifically designed to be used to bore, turn or grind jaws very accurately under a clamping pressure that reflects that required to hold the workpiece.

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Workholding solutions and rotary tables for 4/5-axis machining

Users of 3-axis machining centres can turn to 1st Machine Tool Accessories for a host of Kitagawa rotary table options for adding 4th and 5th CNC axes (www.1mta.com/nc-rotary-tables). They are capable of raising versatility of production, reducing the number of separate machining operations and increasing the complexity of parts that can be produced.

The latest TT150 tilting type compound table with 150 mm faceplate is designed to be interfaced directly with a machining centre control or operated via a MAC mini controller. Alternatively, heavy-duty GT series models deliver extreme rigidity, fast operation and clamping torques up to 2,800 Nm. Dozens of table variants are available, including multi-spindle versions for machining several components at once. Table diameters range from as small as 100 mm up to 630 mm.

1st MTA offers many options to complement its rotary table range, such as manual, pneumatic or hydraulic tailstocks, tail spindles with built-in clamping system, trunnion assemblies, rotary joints, air/hydraulic intensifiers, and manual, pneumatic and hydraulic chuck systems.

A Kitagawa compound rotary table from 1st MTA has added two rotary CNC axes to this 3-axis, vertical machining centre.



Another area of Kitagawa's business is workholding, illustrated by the Japanese manufacturer's recent introduction of the KEM Series of expanding mandrels for ID clamping, allowing full access for machining the outside profile of a component. The number of operations can be reduced and the takt time shortened, leading to more economical production and better accuracy.

A typical example of a special workholding arrangement using this equipment is a dual sleeve expanding

mandrel system mounted on a lathe for internally gripping thin-walled pipe. Parallel expansion offers optimum accuracy and grip force and the expanding sleeves are fully sealed for complete protection.



A KEM dual-sleeve mandrel mounted on a Kitagawa rotary table. Hydraulically actuated and supported by a special hydraulic tailstock, this configuration is ideal for automated machining cells, allowing multiple parts to be robotically loaded and machined.

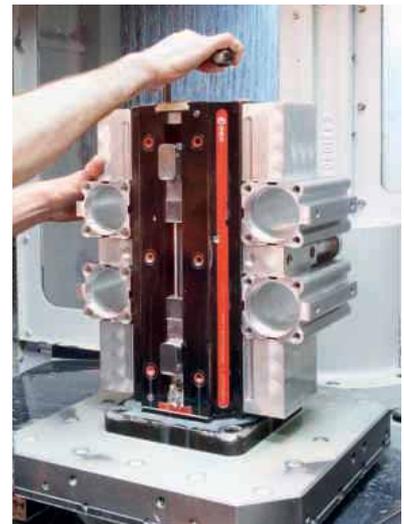
For holding prismatically shaped parts, another of 1st MTA's sole agency lines has proved popular with manufacturers for many years, namely the US-made range of CHICK clamping devices (www.1mta.com/chick-system-5).

Unlike a conventional vice, the modern Qwik-Lok twin-station workholding system squeezes two moveable jaws against a central fixed jaw, cancelling the opposing forces. The results are higher accuracy and the ability to machine two components in a single cycle. It extends the time an operator can walk away to do other jobs and increases productivity, especially as the number of tool changes needed per component is halved.



To take better advantage of the vertical space within a machining envelope, components can be fixtured on an indexing sub-system. The CHICK ISS unit (www.1mta.com/indexer-subsystem) comprises a Multi-Lok tombstone mounted between a 4th axis indexer and tailstock on the table of a vertical machining centre, or on the rotary table of a horizontal-spindle machine.

A CHICK ISS fitted to the table of a VMC. Bespoke clamping is provided by machining the profiles of components into the quick-release aluminium jaws. The set-up also allows access to some edges of the components.



A CHICK ISS, also with QwikChange machinable jaws, mounted on the rotary table of a 2APC, horizontal machining centre. The extruded aluminium components are fixed to two faces of the tombstone only, as they overhang the ends of the jaws.

Such strategies allow more parts to be presented to the spindle in one set-up. Production equipment can run unattended during operator breaks and one person can look after more machines, raising productivity and reducing costs. If the machine is similarly set up before the operator leaves for the day, extra hours of production are gained for little additional expenditure.

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One vice, two workpieces

The Hoffmann Group has introduced a new module for its GARANT Xpent 5-axis vice to the market. This new centre jaw, which can be optionally fitted to the base rail, has now made it possible to clamp two workpieces with just one vice, and to process these in a single operation. This means clamping strategies that are more efficient can be implemented, leading to a measurable increase in productivity.

The GARANT Xpent is based on a modular design concept. Clamping modules, base rails and spindles can be individually combined, and the convex clamping modules can be turned 180 degrees. The newly developed centre jaw offers another bonus in terms of flexibility and is immediately available as an accessory for sizes 0 to 1S and will soon be available in sizes 1 and 2. The existing range of attachment rails, each with two clamping stages, is fully compatible with the new centre jaw.

The GARANT Xpent has a clamping force of up to 40 kN, at a torque of 90 Nm, and is available in three different heights and two

widths. Base rails are available in lengths of 360 to 1,050 mm. The new 1S size was specially developed for 3- and 5-axis machines with small spindle gear boxes.

Word has quickly spread around the market about the GARANT Xpent's excellent flexibility and quality. The vice was awarded an IF Design Award 2018 for its functionality and attractive design.

As a leading system partner for quality tools, the Hoffmann Group combines commercial expertise with both manufacturing and service competence. For 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,



protective workwear, workstations, and storage and workshop accessories. Customers include major listed companies as well as medium-sized and small companies in more than 50 countries. In 2017, the Hoffmann Group generated a worldwide turnover of more than 1.2 billion euros. Including GARANT, its own premium brand, the Hoffmann Group offers 75,000 quality tools from the world's leading manufacturers.

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Sealed 6-jaw power chuck with pendulum compensation

SCHUNK has expanded its product range with a sealed 6-jaw pendulum compensation chuck for clamping deformation-sensitive workpieces. The special seals located on the serrated jaw interface, and pistons of the SCHUNK ROTA NCR-A, prevent grease from being flushed out and prevent the clamping force from being gradually lost.

Precise chuck function is ensured, even at low clamping forces. In addition, the seal prevents chips or dirt from ingress into the chuck body. This increases process reliability and lengthens maintenance intervals, translating into less frequent lubrication and cleaning of the lathe chuck.

Perfect centring and maximum concentricity

The SCHUNK ROTA NCR-A consists of a central chuck piston carrying three inner pendulums aligned at 120°. Each pendulum is connected to two base jaws. This ensures workpiece centring between six contact points, which can be adjusted in pairs. As the clamping forces are directed towards the chuck centre, optimal centring is

achieved without distortion of the workpiece. The chuck perfectly adjusts to the workpiece with its oscillating jaws. With conventional jaw clamping, this configuration allows for maximum concentricity of the workpieces and ensures optimal centring at the same time. In the case of ring-shaped workpieces, deformation is reduced by a factor of 10 as compared to clamping with 3-jaw chucks. Users can also clamp the pendulum of the ROTA NCR-A in the centre position during the final processing stage or when clamping pre-turned surfaces so that all six jaws move concentrically. The clamping force between the first and second clamping can be adjusted by means of a pressure reduction at the hydraulic cylinder. An extremely rigid chuck body and long jaw guidance ensure high repeat accuracy and precise results.

Vast chuck jaw selection

Standard jaws can be used to replace elaborate system jaws and special solutions on the ROTA NCR-A jaw interface. This saves both time and cost-intensive special



solutions, increases flexibility, and reduces setup costs. Because of its high precision, it is possible to eliminate entire production steps, for example, by reaching tolerances during the finishing process that would otherwise only be reached in complex grinding operations. Since the chuck has a very flat design, there is plenty of workspace in your machine for the workpiece and the machining procedures.

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Alpha Precision takes Xtreme measures

Established in 1988, Alpha Precision Engineering is a subcontract precision engineering company that specialises in the manufacture of components and assemblies to customers' specifications. Soon after its formation, the company began working towards achieving all relative quality accreditations and instigated a policy of purchasing state-of-the-art, advanced CNC machine tools and the best available inspection equipment. Alpha Precision now has quality approvals to BS EN ISO 9001, EN9100 and AS9100 rev C and boasts a wide range of state of the art manufacturing plant and inspection aids.

Alpha Precision is located close to Poole Harbour in two adjoining modern factory units with a combined floor area of 16,000 sq ft. The company is able to provide a wide range of engineering services, from the manufacture of bespoke one-off components, to the production of small, medium and large batches. Currently 70 percent of the business' output is delivered to the aerospace and canning sectors. The oil and gas and FI industries account for the majority of the company's remaining business.

To enable Alpha Precision's inspection provision to keep pace with an increase in business, and to help the company maintain its reputation for the quality of its work, two Aberlink Xtreme CNC CMMs were recently installed.

Alpha Precision quality manager, Rob Allen explains: "Given the nature of the demanding industrial sectors we serve, the quality of our output is our number one priority. In addition to first-off checks and regular in-process measurements, the parts and assemblies we produce undergo thorough final inspection routines. To enable our staff to monitor the quality of our output throughout all stages of manufacturing, we provide our skilled production personnel and our quality staff with the latest inspection equipment. An example of this policy is our two, recently installed Aberlink Xtreme CNC CMMs.

"Our first manual Aberlink CMM has proved to be easy to use, very accurate and ultra-reliable therefore, as the launch of the Aberlink's Xtreme CMM's coincided with a sharp up-turn in our business, we placed an order for two of the advanced new CNC CMMs. As Aberlink's Xtreme CMMs feature

temperature compensation and are designed to operate both in inspection departments and on the shop-floor, we have installed both of our new Xtreme CMMs in our production facility.

"Our new shop-floor Xtreme CMMs are now in regular use by our production personnel for in-process inspection checks and for verifying first-off parts. Rather than lose time taking machined parts to our inspection department, now fast accurate CMM inspection results can be achieved close to the point of manufacture. This quick feed-back enables adjustments to be made when components' sizes deviate from nominal conditions.

"Our quality staff also use our new Aberlink CMMs for final inspection routines and for other applications. The CNC nature of the new Xtreme CMMs enables them to be loaded with batches of machined components, the relevant program is then quickly selected and following the press of a button, a rapid, fully automated CNC measuring routine is started. In addition to storing the captured data, related to each measured feature of each component in the batch, when required we are able to generate detailed inspection reports for each component."

The Xtreme CNC coordinate measuring machine was designed to provide accuracy, ease-of-use and speed-of-measurement in inspection departments and in production environments. The global success of the Xtreme means that Aberlink's Gloucestershire based manufacturing facility is now working flat-out to keep pace with both UK and overseas demand for this unique CMM.

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 compensation 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. In essence this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest-to-use and most intuitive CMM software currently available making it ideal for use by both quality and production personnel.

Now the largest UK owned CMM manufacturer, Aberlink's comprehensive range includes 42 standard sizes of both CNC and manual CMM variants. Aberlink CMMs enable the precise measurement of the smallest of components, to parts of over 3 m long and up to 6 tonnes in weight.

Aberlink

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Third Dimension launches pivotal new solution

Third Dimension has launched an all new countersink measurement solution for its GapGun range. The first of its kind on the market, it can calculate the dimensions of a countersink hole to accurately predict the flushness of fasteners once fitted. What's more, it can operate in real-time on the production lines of aircraft, cars and vans, and also in the energy and marine markets.

Last year in the commercial aviation industry alone, 1,481 planes were manufactured with a total estimated 296 million countersinks. The average requirement is to measure five percent of each aircraft's 200,000 countersink holes, meaning 10,000 countersink holes would have to be measured for every commercial aircraft produced. Done manually, these checks rely heavily on the competencies of the operator and are extremely time consuming.

Dennis de Roos, Third Dimension's chief sales & marketing officer, says: "If the hole for a rivet isn't the right size, it will create severe quality problems, either at the time of production or more worryingly further

down the line. Our new, patented system will help prevent these issues in just a couple of seconds, per measurement. For the first time, fastener flushness and countersink characteristics can be measured quickly and accurately, time and time again, with no possibility of operator error."

The patent-protected GapGun Countersink Inspection System enables the prediction of fastener flushness much faster, and more accurately, than mechanical gauge, with the addition of a fully auditable data trail. Tolerance bands can be pre-set, the measurement is recorded against these and then the result can be read onscreen or automatically sent to a PC to enable comparison and analysis.

Countersinks are notoriously difficult to measure in the industry; one of the main challenges for manufacturers is finding a way that factors in how to calculate the centre of the hole. The Third Dimension solution addresses this with a specially designed standoff integrated into the sensor. This enables the system to calculate this crucial point to quality check the



dimensions of hole, before the fastener is fixed in place. The system is based on a single laser line to give the best possible signal quality and therefore accuracy. As opposed to other solutions on the market, multiple laser lines or bars of light produce reflections which degrade accuracy and reliability when measuring the curved inner surfaces of a countersink.

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University of Manchester offers Nikon Metrology CT facility for industrial inspection and academic research

In the Henry Moseley X-ray Imaging Facility at The University of Manchester, which was established in 2003, the versatility of Nikon Metrology computed tomography (CT) systems enables staff members to take on commercial projects as well as academic research. The first system to be installed at the university in 2000 was an XT H 225, which has since been joined by a custom built, large-envelope system with exchangeable 225/320 kV micro-focus sources and an XT H 320 large-envelope system complete with 16-bit detector. Of the 11 imaging systems in the X-ray facility, the three Nikon Metrology systems perform the majority of inspection projects.

Both large-envelope installations have the capacity to hold specimens up to one metre across and weighing up to 100 kg and the high-flux X-ray targets enable fast scanning. The original XT H 225 is used for inspecting much smaller samples. All systems are used more or less 24/7.

Tim Burnett, deputy director of the Henry

Moseley X-ray Imaging Facility, explains: "All the Nikon CT systems are perfect for exploratory work, even by first-time users, because they are quick and versatile. With interchangeable sources and a large range of energies, they allow a lot of different sizes and densities of samples to be studied. Components can be scanned in less than an hour and reconstructed to take a closer look."

The imaging facility was initially opened for internal research but is also used by other academic establishments and for subcontract inspection in industrial applications as well. One member of staff is currently working full-time with industrial customers who come in to the facility, which accounts for approximately 20 percent of the activities. Projects involve investigative analysis of composites, failures in metals and defects in additively manufactured components. The facility also works closely with museums to scan artefacts and even mummies. It also helped to check the



authenticity of the Jules Rimet football world cup trophy.

There has recently been an increase in additive manufacturing (AM) research projects, in collaboration with the University of Sheffield. One purpose is to evaluate how well the shape of a final component correlates with that of the design, looking at the tolerances and any distortions during manufacture. Another involves observing internal defects and voids in AM products.

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New levels of accuracy for jet powered surfboard component manufacturer

M-CNC Precision Engineering is ensuring the accuracy of components manufactured for jet powered surf boards with a range of Bowers Group bore micrometres. As a subcontract multi-axis CNC machining company, M-CNC Precision Engineering has a range of high calibre customers requiring the highest levels of quality. Based in Somerset, the company manufactures parts for Riders Racing of Riders Motorcycles, centre plates for advanced rotary engines for Unmanned Aerial Vehicles on behalf of Rotron Power Ltd, and engine components for Mako Boardsports' revolutionary jet powered surf boards.

M-CNC Precision Engineering approached Bowers Group to help fulfil its ongoing customer demand for an increasing amount of high quality components. M-CNC needed to increase not only its capacity, but also its capability, allowing the business to produce more complex parts with minimal intervention. With clients of such high calibre, producing components of high quality and accuracy is key. Reliable, quality measurement equipment is, therefore, absolutely imperative.

Leigh Howarth, business development manager at M-CNC, says: "We find Bowers Group's products very reliable as well as accurate. The internal bore mics are easy-to-use, accurate, and the adjustable fit is very useful. The guys on the shop floor

love them; they are so precise and straightforward."

M-CNC estimates that the business carries out over 5,000 bore measurements per week, measuring a wide variety of components for a range of applications. Regular measurement of components containing lots of bores means that M-CNC required high-quality measuring equipment to ensure that the measurements are accurate first time, from a measurement range of 10.000 mm to 250.000 mm.

As a leader in bore gauge manufacture, Bowers Group provided M-CNC with a range of bore gauges, including Bowers' XT3 Hometric XT3 digital pistol grip bore gauge. With built-in Bluetooth allowing bi-directional communication with machine tools, the XT3 gives flexibility for data acquisition and storage, further contributing to M-CNC's commitment to embracing Industry 4.0 and increasing its productivity and efficiency.

In addition to a large number of bore gauges from the Bowers Group's range, M-CNC also uses a Sylvac Hi-Cal 450 height gauge. As Sylvac's sole UK agent, Bowers Group supplied M-CNC with this digital, motorised height gauge used for a variety of measuring tasks including step heights, internal/external diameters and centre-line distances. This height gauge benefits from Sylvac's patented inductive measuring electronics and the latest motorised probing system, to give excellent repeatability and ease-of-use.

Leigh Howarth continues: "Our aim is to achieve zero defects by engaging the workforce in the complete manufacturing cycle. We are already very close to that target and our mantra is to 'be the best we can be at all times'. Our quality and inspection is, therefore, a large part of our ability to deliver excellence to our customers."

The team at M-CNC delivers subcontracted manufacturing of high-end precision components throughout the UK, providing CNC turning and milling services to clients across the aerospace, motorsport, nuclear, medical and agricultural industries. The company currently employs 17 people with four apprentices and is actively seeking



more skilled engineers to work in its state-of-the-art facility.

A rigorous commitment to the Engineering industry means that M-CNC continually upgrades its technology to the latest specifications and builds lasting relationships with providers. Fully embracing Industry 4.0, M-CNC is always looking to increase its productivity and efficiency. It has recently invested £2.75 m in eight new DMG MORI CNC machine tools, four mills and four lathes, all multi-axis, some with palletised automation and a robot cell to produce larger volumes unmanned.

M-CNC places high emphasis on customer service, offering consultancy, impartial advice on in-house resources and implementing new manufacturing using the latest technology and machinery to make them more efficient, productive and responsive to the demands and needs of the supply chain within the engineering market.

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SICK launches plug-and-play 'snapshot' sensor for 3D detection

SICK has launched a configurable, plug-and-play 3D detection sensor based on its Visionary-T range of industrial 3D imaging cameras, harnessing the imaging power of SICK's single-snapshot Time-of-Flight (TOF) technology for a range of detection and collision warning duties. With on-board processing, the Visionary-T DT sensor can be easily configured for a variety of applications to detect the presence or absence of 3D objects. It therefore offers a versatile, entry-level option for collision warning on forklifts, Automated Guided Vehicles (AGVs) and Carts (AGCs).

Tasks that were previously difficult to achieve, with a fixed camera, are now quickly and easily accomplished by the Visionary-T DT, for example to detect whether a bin, tote or stillage is completely empty, part full, or overloaded.

The sensor provides 3D image analysis with a simple yes/no, occupied or unoccupied, signal depending on the configuration.

A discrete output signal enables easy integration with an automated system.

Direct communication capability can be set up to a visual display, an acoustic alarm or a PC, and to enable activity recording for later appraisal of any incidents.

The Visionary-T DT can assess the availability of a workstation or cell on a production line where a large object, such as a vehicle or other machinery assembly, is to be moved for the next phase and warn of any intrusions.

SICK's Visionary-T imaging sensors capture high-resolution real-time 3D images with one shot of light, dispensing with the need to profile a moving object through laser triangulation. The SICK single-snapshot technology does not need movement to create the depth-of-field and object resolution required for high-performance 3D detection.

The Visionary-T DT can be configured using a PC, SICK's SOPAS software tool and a purpose-designed Graphical User Interface. 3D objects or detection zones can be taught from the camera without the need for complex programming.

The IP67-rated SICK Visionary-T DT is designed for 24/7 industrial use in rugged



conditions. With a sensing area range of up to 50 by 45 metres at 40 metres distance, the SICK Visionary-T DT provides excellent area coverage around objects and machinery. The powerful light burst illuminates even matt and dark coloured objects, and the adjustable filters allow application-specific optimisation for enhanced detection quality.

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ERIKS launches remote status monitoring system

ERIKS UK & Ireland has launched a new, Industry 4.0 compatible condition monitoring system for the remote access and predictive maintenance of critical assets.

The e-Connect, which provides 24/7 visibility for operators, engineers, and maintenance managers, monitors and gathers the data of crucial assets to provide insight into condition, behaviour and performance. This information can then be analysed by operators, who can use their findings to reduce the downtime and costs associated with unexpected maintenance and repairs.

The e-Connect is currently available in five versions, from a basic check and alarm to an advanced diagnostic and prognostic evaluation system. Users can specify the most suitable, and therefore most cost-effective version depending on their needs. Each version can handle four, six or eight channels as standard, and can be extended, depending on the application.

The e-Connect can provide real-time information on a number of process

variables, including pressure, vibration, speed, viscosity, and current. Depending on the version specified, users may also receive this information remotely in order to supervise the performance of an asset, even when off-site.

In line with the latest advances in Industry 4.0 technology, the e-Connect enables users to adopt a predictive maintenance strategy by identifying and removing the root causes of machine failures before they impact production. Preventative maintenance support is provided through warnings of imminent failures or underperforming equipment, with additional functionality for predictive stocking, spares supply chain, near-miss analytics and big data analyses also available.

For added functionality and insight, users can connect the system to ERIKS' know-how cloud-based platform. This provides access to technical advice, as well as on-going monitoring, maintenance and data interpretation support.

David Manning-Ohren, condition monitoring manager at ERIKS, says: "Thanks



to our extensive knowledge of the industry, and its needs, we have been able to design a system that covers many aspects of Industry 4.0, such as condition monitoring, predictive maintenance and data analysis.

"The e-Connect system helps users to improve their visibility and awareness of crucial assets located both on and off-site, whether they be a fluid-handling system or a machining centre for parts.

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VERICUT V8.2 features seamless access to Sandvik Coromant CoroPlus ToolLibrary

CGTech, developer of the leading independent CNC verification, simulation and optimisation software, VERICUT, has announced that its latest release, Version 8.2, will include a seamless interface with the Sandvik Coromant CoroPlus® ToolLibrary, making it easy for customers to work with Sandvik Coromant tools.

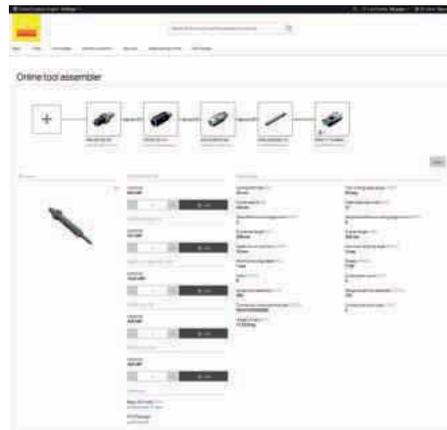
VERICUT accurately simulates all aspects of the CNC machining process to identify errors in the NC programs, such as collisions, over-travel, gouges and so on. Using VERICUT, manufacturers can verify the NC program before it is transferred to the machine tool, reducing or eliminating the need for the time-consuming manual prove-out process and minimising material costs. This ultimately improves the efficiency of the business.

Accuracy and efficiency are the two key words. Because users can create digital tool assemblies within CoroPlus ToolLibrary that can be subsequently imported directly to VERICUT, significant time savings can be achieved.

Tony Shrewsbury, managing director, says: "We believe users can reduce the time needed to create a typical tool list by around 50 percent, with the added benefit of knowing that the tools will be an exact digital representation of the physical tool and completely error free. All of which can only add up to further gains in efficiency when using VERICUT."

CoroPlus ToolLibrary is a digital tool library that removes the need for users to browse catalogues and webpages to find the required tool data. Featuring equivalent functionality, CoroPlus ToolLibrary is available online as a web-based application, and offline for companies where security prohibits engineers from accessing the internet.

The database is 'open' to all other tools



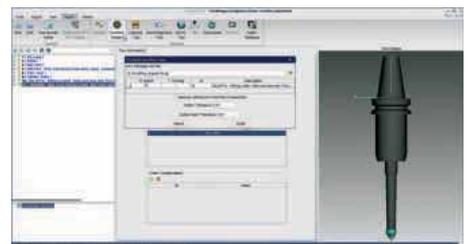
from any supplier that conform to ISO13399. CoroPlus ToolLibrary is developed to support Industry 4.0, allowing users to import tool assemblies directly into VERICUT with access to tool catalogues containing perfect STEP format digital representations of the physical tools. So, the planning of machining operations using the exact dimensions and models of the tools enables accurate CAM programming and simulation, reducing the risk of collisions during machining. While the machining process parameters, such as spindle speed, depth of cut, step-over and feedrate per tooth, help improve efficiency for the CAD/CAM programmer.

Tony Shrewsbury explains: "Tools imported using CoroPlus ToolLibrary are not just dumb CAD models, there is an exceptional depth to the useful data transferred 'behind the scenes', making verification and optimisation in VERICUT that much more efficient. Removing or reducing the data input required by the CAD/CAM department minimises the risks of error. When you are compiling a tool list for a machining centre, with upwards of 240 tools in an ATC, it is not difficult to imagine a point being misplaced or the wrong value being entered. Also, there is the considerable time savings gained by eliminating the need to search catalogues and other sources for references and cutting data, with the extra reassurance that different tool items will always fit together correctly."

Users can find the tool simply by inputting the tool ordering code or using filter

commands. The finished assemblies are then imported to VERICUT for simulation.

Pernilla Lindberg, Sandvik Coromant product manager for CoroPlus ToolLibrary, says: "Selecting the right combination of toolholder, tool body and inserts is simplified and expedited using CoroPlus ToolLibrary. Giving the customers the possibility to easily work with our tools and accurate data for simulation in VERICUT is a good example where 'one plus one equals three'. This cooperation enables manufacturers cutting metal in any industry sector to increase the efficiency of their business."



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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hyperMILL CAM strategies for aircraft construction

OPEN MIND at the Farnborough International Airshow 2018

OPEN MIND will be exhibiting at the Farnborough International Airshow from 16 to 22 July 2018. On **Stand 41660 in Hall 4**, the CAD/CAM developer will present the hyperMILL® CAM solution for companies in the aviation and aerospace industry. The leading software for 5-axis machining pushes the limits of machining centres to meet the special industry requirements for complex parts and sophisticated materials. The company will provide information about milling, turning, HSC, HPC, 2.5D, 3D, and 5-axis machining, as well as process chains involving PLM and simulations.

OPEN MIND will present proven solutions for the aviation industry with modules for easy, secure programming of impeller, blisk, and blade machining.

hyperMILL also includes many interesting features for the challenges posed by other complex parts. These include a range of innovative 5-axis simultaneous strategies that enable efficient machining of challenging geometries such as free-form surfaces or deep cavities. For example, 5-axis helical drilling, a helical tilt milling method in which the milling tool is tilted in cutting mode, allows holes to be formed easily and efficiently. A second tilt prevents collision with the hole wall. This is advantageous because only one tool is needed for different drill diameters, or open pockets of varying sizes. Pre-drilling is not necessary, and the strategy is very well suited for materials that are hard to cut.

hyperMILL MAXX machining

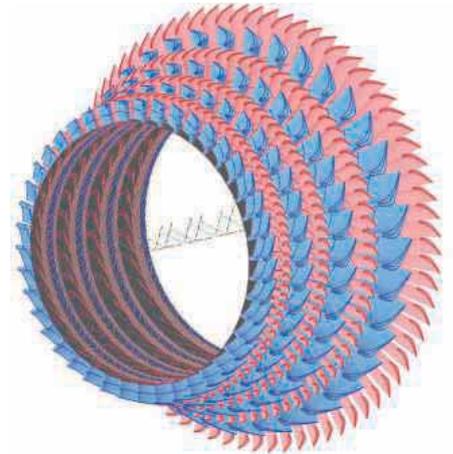
The hyperMILL MAXX Machining performance package is comprised of a set

of machining strategies that are highly popular in the aerospace industry. Machining strategies in this package that will be presented at the trade fair include the extremely efficient finishing of difficult-to-access surfaces for which OPEN MIND has developed 5-axis tangent plane machining with conical barrel cutters. This offers enormous potential for optimisation as it takes 90 percent less time than conventional methods.

“Aircraft manufacturers and their suppliers represent an industry that sets high standards in terms of innovative materials, machining quality, and secure processes,” says Ilias Mustafa, director global accounts, at OPEN MIND Technologies. “At the Farnborough International Airshow, we will show attendees how they can use innovative hyperMILL strategies to further increase their productivity and competitiveness.”

Turbomachinery made easy with hyperMILL and AxSTREAM

OPEN MIND Technologies and SoftInWay Inc. held the workshop ‘Turbomachinery made easy - Seamless workflow from design to manufacturing’ in June at Seco Tools in Warwickshire and the Bankettcenter, Stuttgart Airport. The free of charge events showed the designing and optimising of rotating components with OPEN MIND’s hyperMILL CAM software and SoftInWay’s AxSTREAM® CAE software to machine the designed part. Both companies are known for their best-in-class software platforms that provide component developers the needed productivity tools to accelerate the product development and production



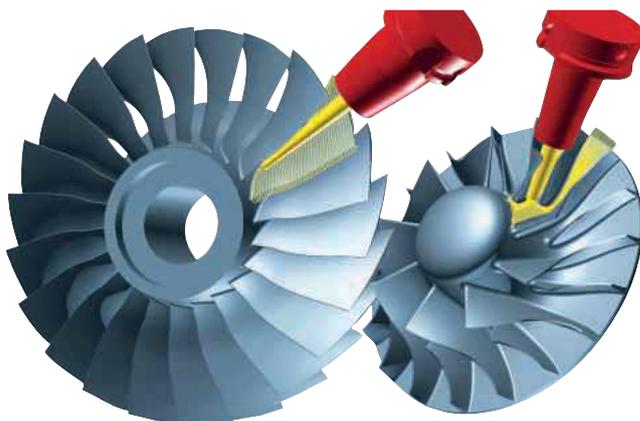
process while maintaining a high level of accuracy. The two companies have a cooperation to provide a complete solution for the design, development and manufacturing of gas turbine components and other types of turbomachinery.

With increasing pressure on all turbomachinery to be highly optimised, manufactured to greater tolerances and designed faster than ever, the need to have a seamless workflow from design to manufacture has become a major requirement throughout industries such as aerospace, automotive, and power generation. This seminar brought together two leaders in turbomachinery design and manufacturing applications to offer an end to end solution from concept to finished product.

OPEN MIND and SoftInWay provide companies worldwide with the tools to achieve an integrated and efficient workflow from preliminary design to optimised cutting strategies for rapid manufacturing. The AxSTREAM software consists of a number of different modules to perform preliminary design, meanline and streamline analysis, CFD and FEA, blade profiling, and rotor dynamics, bearings analysis, and rotor design for compressors, pumps and turbines. These tools are used to produce optimal components, considering speed, power, range, and life.

For more information, contact:

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Email: info.UK@openmind-tech.com
www.openmind-tech.com

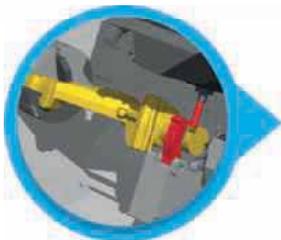


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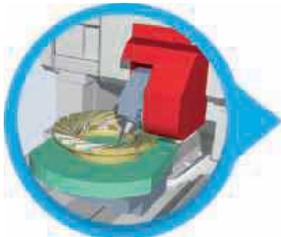
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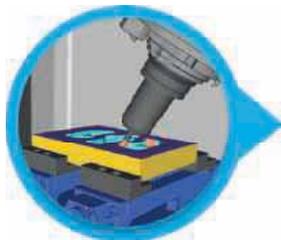
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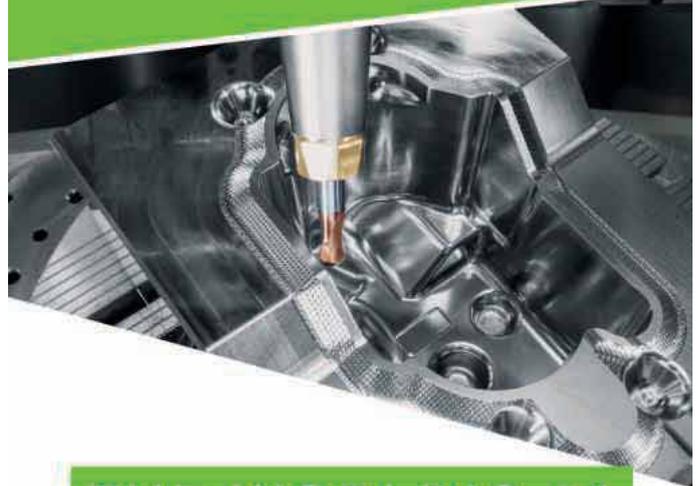
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Autodesk FeatureCAM 2019

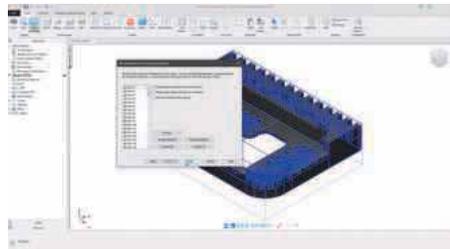
Autodesk has updated its well-established FeatureCAM application with upgrades, improvements and elements designed to make it easier and more productive to use. FeatureCAM is a familiar CAM program from Autodesk, it has been pretty much the go-to solution for over two decades. There is always a challenge to make the very good even better, and the company believes it has made a major step forward with FeatureCAM 2019.

As its name suggests, FeatureCAM offers a feature-based CAM approach. Instead of having to program a machine stage by stage, the operator can program it using everyday shop terms, such as 'turn', 'bore', 'bolt' and so on. It has sufficient intelligence to recognise needs and requirements from such terms and will automatically adopt the right speed and torque strengths without having to be instructed, line by line.

Faster and more customisable

FeatureCAM allows the user to program a process more quickly and to get consistent results across a wider variety of parts and machines. It has a huge range of customisable settings supplied with the program. The user can even set customised settings as a default, which saves a lot of time in going through layers and layers to get to the right parameters.

There are other software apps that offer similar features, but FeatureCAM has the advantage that it is built as features, from the ground up. Every non-essential step that can be taken out of the process helps with speed and consistency, in software programs as much as in Lean Manufacturing.



The Directed Automated Feature Recognition (DAFR) capability automatically recognises holes, bosses, sides, and pockets in a single workflow, which enables faster programming. While standard AFR slices the model in the active Z-axis and produces complete features as it makes its way down the model, DAFR allows the user to select the features they want even before recognition begins.

Directed automated feature recognition Saving time while cutting material

This is not as step-by-step as existing software. It minimises programming time and helps to reduce cycle time. In a break with convention, DAFR can also be used in turning projects; it gives users the option to choose index angles. This helps to reduce the number of Z axes required and so speeds up cutting. Centre drilling programming has been enhanced with the introduction of additional parameter controls for centre drills.

Both custom tip and included angles can now be set on the tool, which means that centre drills can be used for defining more accurate chamfers. There is no need for additional operations to adjust tip angles, the NC code is automatically adjusted in the process. Safety and part accuracy are



greatly improved and cycle times can be cut significantly. Setup, creation and editing have been amended to improve the user experience.

FeatureCAM 2019 has introduced Tabs in place of the 'wizard' in the setups dialog, which helps to speed up decisions enormously. FeatureCAM 2019 also combines the Z axis selection functions into a single button, which is more intelligent. It also makes for better edge picking.

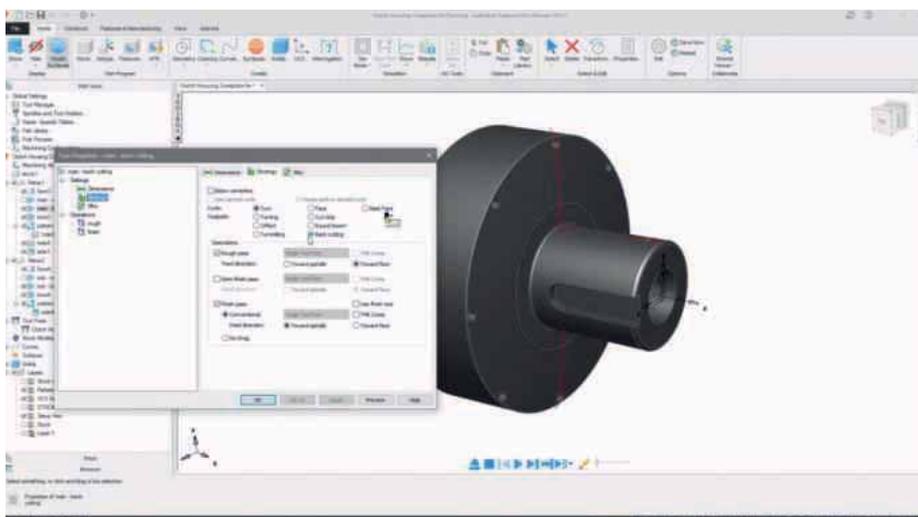
Modify centre drill geometry

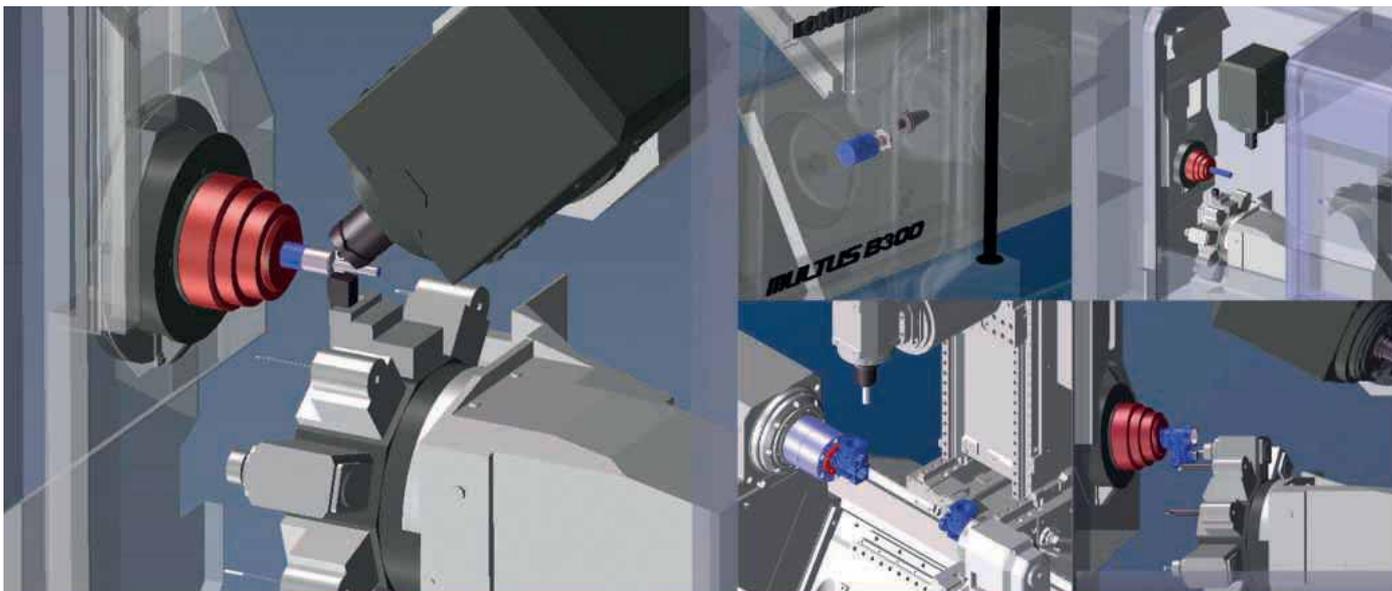
Grids, threads and roughing it Snapping grids have new options for displaying lines, dynamic scaling and grid size control. The curvature tool now has an additional tool to indicate the draft angle of chosen faces. In another step to improve ease-of-use, and productivity, the thread list now features thread families grouped together, along with access to more standard threads, such as ACME and Trapezoidal. The Tool Post window colours and icons help identify main and sub-spindle operations, as well as tool or spindles for Swiss machining.

A number of hidden menu options are now in the features dialog, including log and initialisation files and post-processing debug options. Roughing and finishing passes can be set in grooves. The new back cutting feature addresses the use of new inserts, such as the Sandvik Prime Turning™ range.

The new tool pass strategy allows you to turn in all directions with the same insert. This extends insert life, while improving metal removal rates.

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GibbsCAM Multi-Task Machining

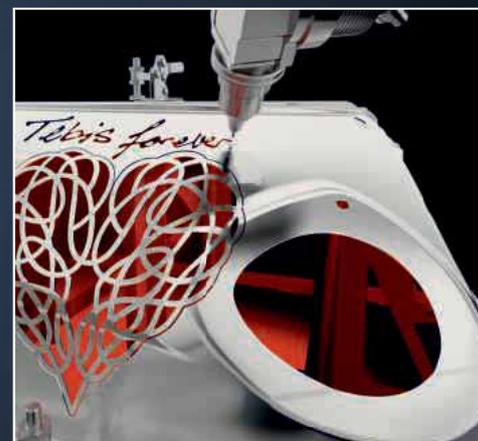
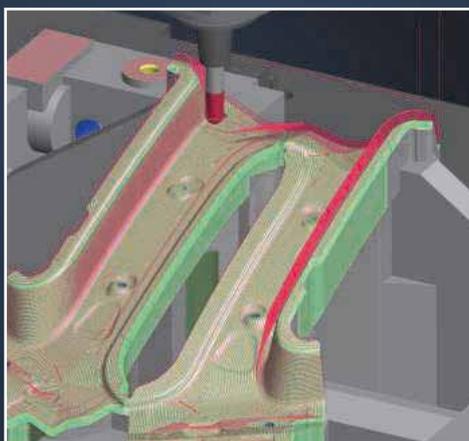
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THE CAD/CAM EXPERTS

Mastercam sets new CAM industry milestone

CNC Software, Inc. has announced the company's flagship software, Mastercam®, is the first CAD/CAM software to reach 250,000 installations worldwide. The 250,000th seat was purchased by Roding Automobile GmbH, a division of Stangl & Co. GmbH Präzisionstechnik, a precision manufacturing company in Germany.

This announcement celebrates CNC Software's global community of Mastercam resellers, users, and the world's largest community for CAM support, service and expertise. With more shops using Mastercam than any other system and more people choosing to learn Mastercam to secure their futures in manufacturing, this comprehensive reach is vital to future success.

Meghan West, president and CEO of CNC Software, Inc, says: "This milestone demonstrates our total dedication to the needs of machine shops and the manufacturing industry. Our focus is always to provide the best CAD/CAM software, service, and support available to serve the needs of both the industrial and educational

markets. Reaching our 250,000th installation shows the strength of Mastercam as a user-friendly platform to achieve speed, efficiency, and innovation in manufacturing now and long into the future."

Stangl & Co. uses high-level innovation in technology and manufacturing to make custom, precision parts from prototype to series production for industries such as automotive, motorsports, electronics, aerospace, medical technology, tool and mould making. Roding Automotive is an international service provider to the vehicle industry. The company develops, constructs and manufactures working prototypes and future-oriented vehicles with lightweight, carbon structures and electric drive.

Stefan Kulzer, managing director of Stangl & Co, says: "Mastercam is a high-performance CAM system that fully meets our various requirements, especially in 5-axis milling. Mastercam delivers a broad range of solutions for different types of machining, with excellent price vs. performance compared to the other CAM systems. InterCAM's 25-year partnership



with CNC Software and loyalty to its customers is the best proof of the Mastercam CAM system."

Andreas Stute, managing director of InterCAM-Deutschland GmbH, representing Mastercam in Germany, concludes: "This is a reason to be doubly pleased. On one hand, we reached the 250,000th installation with a considerable lead over our competitors, which shows our technological advantage. On the other hand, it's a great feeling to see this specific license go to a German company who we will get to work with as it expands already impressive offerings."

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Outstanding 5-axis functions and greater ease-of-use

Tebis AG has announced the next release of its Version 4.0 software with a focus on 5-axis functionality in the simultaneous milling strategy.

Release 6 sees new and optimised functions in 5-axis simultaneous milling which are a highlight for all those who want to better utilise the potential of their modern high-performance machines. Tebis users can now witness the following in 5-axis simultaneous milling: new highly efficient adaptive and contour parallel roughing strategies; simple, fast machining of connected milling areas in isoparametric surface layout; integrated tilt direction preview when milling between vectors. Many features have been integrated to greatly simplify the daily work of shop floors.

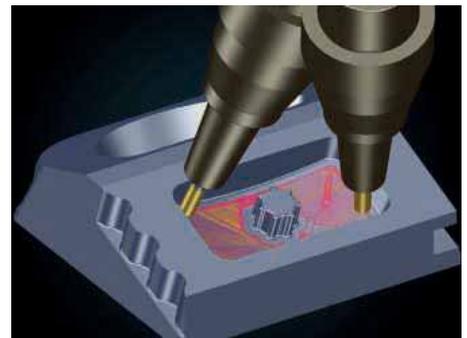
Within the CAM functionality, the "NC5ax/MSurf" function for 5-axis simultaneous roughing is suitable for all those who want to take advantage, with minimal effort, of the benefits of 5-axis simultaneous machining when roughing free-form surfaces. For example, in die manufacturing, where large free-form surfaces often must be manufactured with

few cavity fractions, select the surfaces and blank and it's ready to start. The function provides the adaptive and contour-parallel path layout. The "NC5ax / MPocket" function is exactly matched to 5-axis simultaneous roughing of part areas with many cavity fractions. Adaptive and contour parallel milling strategies are integrated. High-performance HPC tools can machine high volumes of material very quickly, especially in adaptive roughing.

Connected milling areas can now be machined in a single operation and with no extra design effort, even for isoparametric path layouts, you can select the surfaces, display the milling area and start the calculation. Highly complex part areas can be easily prepared with the "NCPrep/Drive" function.

5-axis simultaneous finishing with the "NC5ax/MSurf" function has been further optimised in Release 6, where the integral tilt direction preview lets you check and optimise the quality of the tool direction already during programming.

For CAD preparation milling areas for 5-axis simultaneous milling can easily be



defined. For parts with highly complex geometric properties, the "NCPrep/Drive" function provides a convenient way to generate and optimise milling areas for 5-axis simultaneous milling, for instance using guide curves or planar cuts. The path layout can be displayed already in advance, the starting position can be adjusted, overlaps, kinks and head movements can be detected and if necessary the cutter offset can be changed or if needed smooth the paths in the milling or stepover direction.

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A GibbsCAM distributor since 1988

Tech CAD/CAM is celebrating 30 years as the UK distributor for GibbsCAM. The Suffolk-based company distributor has been bringing innovation to the manufacturing industry since 1988.

Tech CAD/CAM offers a range of innovative and intuitive CAM software products which aim to be simple to learn and productive to use.

The company's highly experienced team is able to assess your needs and find the right combination of software, support and service to allow your business to excel and achieve its full potential.

GibbsCAM is a cutting-edge CAM system for programming CNC machine tools and has the power and flexibility to let you make parts the way you want. With its easy-to-navigate shop-friendly interface, you'll maximise productivity. Whether CNC programmer, machinist or manufacturing engineer, the user will find familiar terminology. Icons will make sense and processes will be logical. With GibbsCAM, CNC programming is flexible, fast, reliable, and efficient.

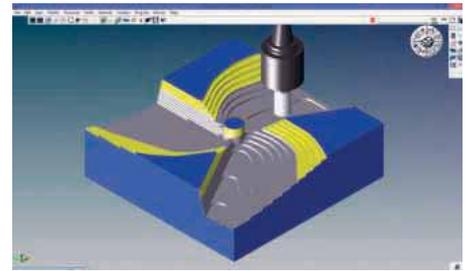
GibbsCAM programs any CNC milling, turning, mill-turn or wire EDM machine. From 2-axis turning and 2.5 axis milling, to 3-, 4- and 5-axis simultaneous and the most complex multi-spindle, multi-turret, multi-tasking and Swiss-style MTM machines, GibbsCAM drives them all.

The interface icons are easily understood and the menu structure flat, so programmers don't have to step through menu after menu to get something done. It enables quick navigation and fast programming for experienced programmers and rapid learning for new programmers.

Whatever CAD format your customers, designers or engineers prefer to use, that's the format that GibbsCAM will read or open directly and accurately, so you can quickly modify part models for machinability.

Accurate, flexible and reliable toolpath creation

GibbsCAM reads, translates, creates, modifies and machines part features with precision. It provides multiple ways to drive

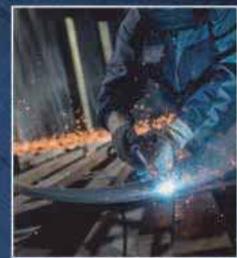


cutting tools, including high-speed machining strategies, so parts can be programmed and machined your way. It saves tools and processes, so you can quickly program a family of parts or react to engineering without having to reprogram the entire part.

Toolpath simulation with collision detection, which is available at any point in the programming, shows tool motion and rendered surface finish, highlighting gouges and unwanted cuts for fast error correction.

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Scan system intelligence for mass production

excelliSCAN scan head reliably meets the toughest requirements for laser micro-machining and additive manufacturing

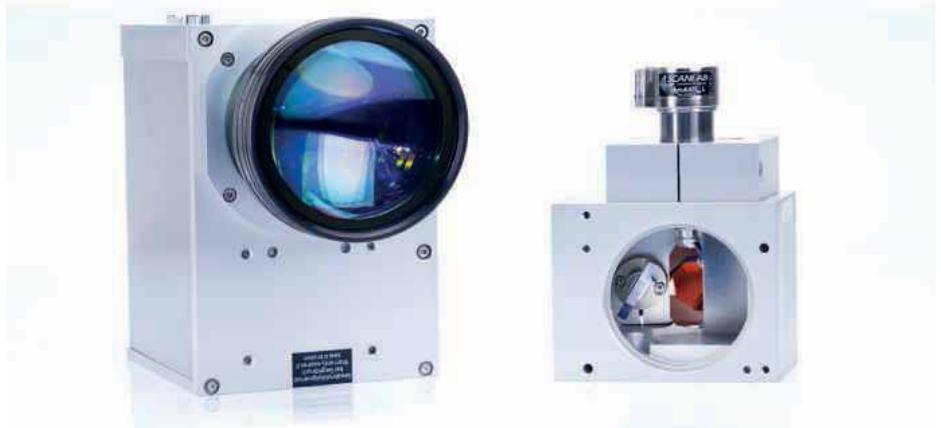
At the recent LASYS exhibition in Stuttgart, laser deflection and positioning technology leader SCANLAB GmbH announced series production of its high-end excelliSCAN scan system. This premium scan head proved its suitability for reliable industrial deployment in series micro-machining and has now itself gone into series production. Importantly, the scan head's built-in intelligence predestines it for integration in automated fabrication environments that leverage Industry 4.0 and IoT (internet of things).

As industrial processing complexity increases as well as the quality or safety-relevance of manufactured components, the saying 'time is money' becomes even more applicable. This fuels the need for processing solutions that raise productivity. Modern laser micro-machining methods are ideal for helping the electronics industry and other sectors to meet these challenges.

Extensive excelliSCAN test applications confirm that its unique servo design delivers considerable productivity gains for numerous applications. The scan system features novel SCANahead servo control as well as galvanometer scanners with highly precise digital angle sensors. Its in-built intelligence can be compared to autonomous driving: the scan head autonomously calculates its own control parameters and anticipates in real time for optimal navigation of curves. This servo innovation breaks through the irreconcilability between higher dynamics and maximum precision, and thus provides an appreciable productivity boost to users. Additionally, contour fidelity is substantially improved at high marking speeds, for



The excelliSCAN scan head is perfectly suited for laser micro-machining and additive manufacturing



New intelliSCANse 20 and 30 digital-encoder-equipped 2D scan heads

example when traversing sharp corners and circles. Control is furnished as standard by the powerful RTC 6 control board, now available as an Ethernet variant.

Another element of the Smart Factory

This premium scan system offers even more power for factories of the future. Integrated functions like online status monitoring or acquisition of operating times and process data allow not only integration in networked structures but also retrospective process analysis.



Georg Hofner, CEO SCANLAB GmbH

"We're very pleased with positive user feedback on the excelliSCAN. When applications have particularly challenging technical requirements, then our own standards for the applied technologies are likewise exceptionally rigorous," explains SCANLAB CEO Georg Hofner regarding the start of series production. "To secure future gains in maximum speed and precision, we'll continue on the trajectory servo path we

have embarked upon and the next step will involve planning trajectories."

In view of the strong demand for high-precision scan systems well-suited to micro-structuring and 3D printing, SCANLAB is already working to extend its excelliSCAN family: scan heads with 20 mm and 30 mm apertures are in the pipeline.

SCANLAB will be exhibiting at LASER World of Photonics India 2018 from September 26th to 29th 2018 in Bangalore, India.

With over 30,000 systems produced annually, SCANLAB GmbH is a world-leading and independent OEM manufacturer of scan solutions for deflecting and positioning laser beams in three dimensions. Its exceptionally fast and precise high-performance galvanometer scanners, scan heads and scan systems find application in industrial materials processing and the electronics, food and beverage industries, as well as biotech and medical technology.

For more than 25 years, SCANLAB has secured its international technology leadership through pioneering developments in electronics, mechanics, optics and software, as well as the highest quality standards.

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Latest Javelin release improves business efficiency and saves time

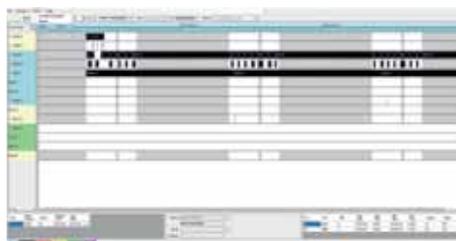
Around a dozen key areas in the new 2018 R2 release of Vero Software's Javelin ERP/MRP production control system contain items of new and enhanced functionality.

With an ethos of improving efficiency and cutting down the time taken in a number of areas, the main updates are in Javelin's core business control competencies.

In addition to existing warnings and error messages about non-compliance within operations, the latest release includes a Part Status, which allows the user to create their own warnings.

Javelin account manager Andy Mills explains that they can be specific to clients: "Examples would be where a part is pending, or a review is coming up. The operator can add a pre-warning, which flashes up on screens such as Sales Orders, Purchase Orders and Works Orders."

A major reworking of Stock Check separates recording the physical and financial changes into two phases, meaning errors are verified and corrected quicker and easier.



Advanced Scheduling

A Price Book button has been added to the Part Enquiry so that the price can be amended quickly and easily. And changes have been made to the Bulk Contract functionality, enabling updates to be made to active data while the system is live. Also, parameters and variables, which previously appeared in the order they were put into the system, now have a sequence number, so that the operator can specify the order.

A general enhancement throughout Javelin 2018 R2 puts icons on to many key screens, defined by Item Type, Product Group, Responsibility Code, or Part Status.

"This means aspects such as individual lines and Orders can stand out, and the icon also shows the status of the orders is open, closed or late," says Andy Mills.

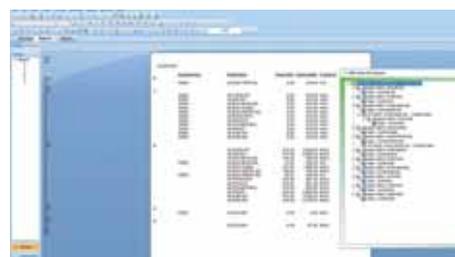
The Advanced Scheduler was originally introduced three years ago, running in time sequence down to ten millionths of a second, with the results appearing on the Planning Board. The latest version includes a valuable Undo button for the last action. And, following client feedback, the Horizon now defaults to the end of the current calendar year instead of ten years, as in previous editions.

Contract costing runs are now managed from the Command line, so they can be scheduled to run overnight. "This is particularly valuable for long, time consuming, runs, meaning the system can be freed up during the day for other functions," says Andy Mills.

A number of enhancements to CRM include an autogenerated 15-character reference on the front page and booking dates as an optional field which defaults to Due Date but can also change to range or location. The Add Prospect is now auto populated when the first item is added to the Opportunity and the delivery date/time display has switched to just the date, for easier reporting.

Works Order and Purchase Order reporting on MRP has been made easier, along with the ability for MAP data to be expanded. Responsibility Code and Planner ranges have also been added to the suggested WO reports, with Responsibility Code and Buyer ranges to the WO report. It is now possible to add 9,999 lines to the PO.

"It used to have 999 lines," explains Andy Mills, "but customers requested considerably more. For example, if they supply regular batches of a product, they may want a blanket Sales Order and the option to keep on adding lines, making it an open Sales Order for mass production. Icons can also be added to the lines as a Favourite."



MRP Map Data



Part Status

The Supplier Default Ancillary Charge can now be defined against a Supplier, automatically added to all new Purchase Orders, while Crystal Templates will now generate Reject Notes.

Sales Order Copy now allows a New Due Date or Promise Date to apply to all lines at once. The addition of an Optional Reference date on each SO line gives users the ability to add specific items, especially for reporting purposes. Andy Mills says it is a free date field which does not take part in any calculations.

The SO Enquiry screen is larger in Javelin 2018 R2, showing more information at once, including line comments. "Also, instead of having to go through a set sequence, Delivery Note and Picked Items can now be cancelled in one operation from a single maintenance screen," says Andy Mills. "Previously, even Batch Invoicing routines were the same and had to be managed individually as part of the invoicing process. Now operators can set the way they want to do it in the housekeeping customisation function, cutting out repetition and the chance of errors."

On Work In Progress, the Split Works Order has been streamlined providing the most efficient way of splitting a WO. And WO deletion includes several new range options, along with options to delete unstarted or complete orders.

"When the Refurb WO is created, a new piece of functionality called Default Refurb Routing adds the original principal manufacturing method, such as punching or profiling, to the specific part. This makes it quicker to import the default routing to rework the part," explains Andy Mills.

Non-productive bookings, such as lunch breaks, are now defined within shift patterns, so supervisors can see them across

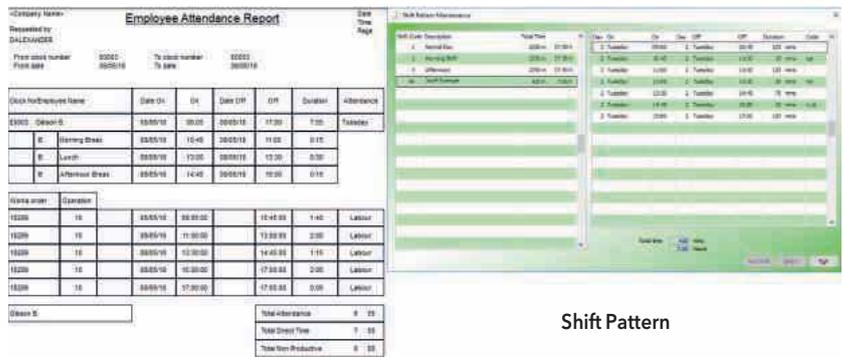
the shift, instead of needing to access each operative's record. These breaks can automatically take the break duration from the work orders that the employee has been booked onto.

Finally, a number of system changes include additional security measures, giving management more control over access to the Javelin database for Crystal Reports, while employee absence data is further restricted, assisting with GDPR compliance.

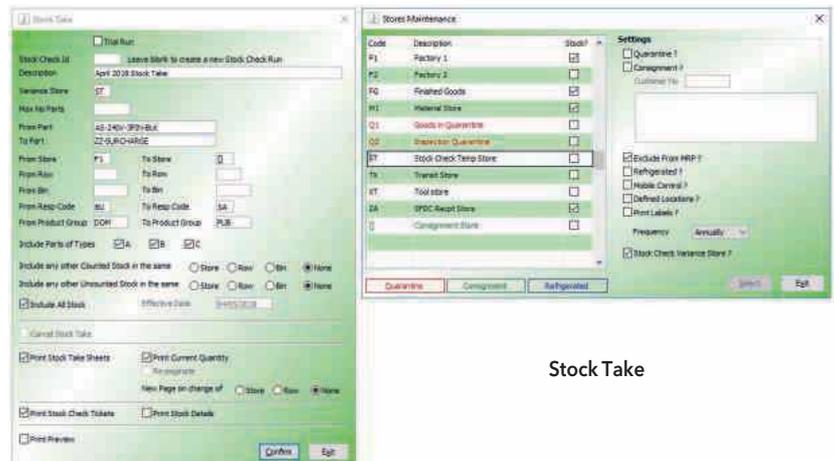
An enhancement to the PowerUser Licence Reservation function means an Administrator or Manager may now have reserved a number of licenses, so they can always be able to access the system.

In conclusion, Andy Mills says the overall ethos behind the changes in Javelin 2018 R2 is to improve efficiency and reduce time taken to perform tasks: "It shows our continuing commitment to refine the software, so that users can optimise their business operations and see a live snapshot at all times. Many items of new and enhanced functionality in each new release are driven by customer feedback."

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Shift Pattern



Stock Take

Live production information using PSL Datatrack Status Boards

The contribution that PSL Datatrack production control software can make to subcontract engineering companies looking to improve production efficiency is widely recognised. Many engineering organisations, serving many different manufacturing sectors, are already benefiting from the control and functionality that the software offers. This has been further enhanced with the new 2018 Status Board display system which can give visibility to real-time KPIs (Key Performance Indicators), system alerts and action lists, giving even more control over manufacturing processes. The graphical display of the boards has been reworked to give a bolder, enhanced presentation and make an even greater impact on the shop floor.

PSL Datatrack Status Boards can be put on display throughout a factory to deliver clear visual information to all departments on any aspect of production. Management can have visual real-time information in the boardroom, including actual sales versus projections and targets. Dynamic, real-time

information to specific areas of the factory on many different KPIs gives essential information at a time when close control of costs and providing the highest service levels to customers is vital.

Real-time display of shop floor information highlights the current work-to-list and the jobs requiring work that day, avoiding accidental oversight of vital work. The example shown uses a T-Card style display for shop floor loading. Status Board displays can highlight which customer deliveries are due out on a particular day, allowing management decisions to be made on production as a whole. They can also warn if targets are not being met and give the shop floor priorities to focus on.

These can be complemented by stock alerts that show whether any materials or components required to complete a job have dropped below minimum quantity levels and need replenishment. Real-time goods-in statistics highlight which deliveries are due in and which need to be followed up in the event of non-arrival.

PSL Datatrack status boards are designed



to a customer's exact requirements to show the information they want visible, as one size does not fit all. In the quest to get each production task right and complete on time every time and the need to be competitive, these are a vital addition to the PSL Datatrack solution.

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TruLaser 2030 Fiber: the compact powerhouse for laser cutting

The new laser cutting machine from TRUMPF, the TruLaser 2030 fiber, is intuitive in operation and low investment and operating costs make it particularly suitable for the needs of businesses starting out in laser cutting. Equipped with up to four kilowatts of laser power, it is remarkably productive. If required, the TruLaser 2030 fiber is also capable of fully automatic manufacturing.

Intuitive operation reduces amount of training needed

Only 7.8 x 5.9 m of installation space is required for the TruLaser 2030 fiber, including pallet changer. Important components such as the switch cabinet, suction system and laser are built into the machine frame. The three-metre working area is easily accessible along its whole length and is designed for large formats. Large windows and LED illumination provide optimum views inside the machine. It also fulfills all requirements with regard to laser safety.

Its ease-of-operation meets the needs of newcomers to laser cutting. If the operator of the TruLaser 2030 fiber wants to assign a job, the relevant questions for setting up and programming the machine appear on the control user interface. The user is guided by the interface through the various steps until the program starts. TRUMPF cutting parameters for all materials and sheet thicknesses are stored on the machine prior to delivery. Together with its intuitive operation, this significantly reduces the amount of requisite training. Cutting programs can be easily transferred to the TruLaser 2030 fiber using a network or USB drive. In practically no time, drawings can be created directly on the machine and converted into cutting programs.

Machine dynamics, short setup times and automation solutions increase productivity

TruLaser 2030 fiber is available with two, three or four kilowatts of laser power. It displays its strengths especially in sheet thicknesses from one to twelve millimetres, where it cuts very fast. It also processes thicker sheets. Thanks to the robust TruDisk solid-state laser, the TruLaser 2030 fiber can



The TruLaser 2030 fiber combines the advantages of solid-state cutting

cut highly reflective materials such as copper even using nitrogen. All materials and sheet thicknesses can be processed with the same cutting unit. This saves setup time, as there is no need to change the lens and cutting head. Along with other parameters, the focal position of the laser also adjusts automatically to the respective material. The cutting head's collision protection and an automatic nozzle changer with space for eight nozzles reduce setup times even further.

Depending on the capacity utilisation and the degree of automation wanted, the machine is available with a pallet for manual loading and unloading, a pallet changer or LiftMaster Shuttle. The retrofittable LiftMaster Shuttle makes it possible to load and unload the machine on a fully automated basis. Available in many different installation versions, the TruLaser 2030 fiber adapts perfectly to the material flows and space conditions of the manufacturing operations at hand.

Configurations for various application scenarios

The various laser-power options and material-flow solutions permit different application scenarios. Equipped with two kilowatts of laser power and a manual pallet, the TruLaser 2030 fiber works cost-effectively even at lower utilisation rates. The combination of three kilowatts of laser power and a pallet changer increases application flexibility and productivity. Thanks to the increased laser power, it is possible to process thicker sheets. Using the pallet changer, the machine works efficiently



The nozzle changer with eight spaces precisely replaces the nozzle in the cutting head on a fully automated basis. This reduces non-productive times

in one- or two-layer operation; material changes take only 45 seconds. Meanwhile, the TruLaser 2030 fiber with 4 kW of laser power, automatic nozzle changer and LiftMaster Shuttle is ideally suited for continuous operation.

To increase the capacity utilisation of the laser and to reduce the investment costs, the machine can also be operated in a laser network. To this end, the TruDisk laser has an additional output as an option. In this way, the laser can supply an additional machine or welding cell as well as the TruLaser 2030 fiber. This reduces procurement costs for the second laser and facilitates the entry into new technologies such as laser welding or laser tube cutting.

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Fabricator reports a flood of new work

Kent company swaps CO₂ for fibre laser cutting to keep pace with demand

Established in 1967, Stevens & Carlotti produces metal fabrications at its Sandwich, Kent factory for customers in the UK and continental Europe. A jump in turnover of 25 percent in 2017 compared with the previous year looks set to be followed by a further 50 percent increase in 2018, which has unsurprisingly caused some production and logistical issues. The situation has resulted in an increase in headcount from 70 to 100 staff in the last 18 months as well as a £1.5 m investment in new machinery since September 2017.

Part of this sum was allocated for the purchase in October 2017 of a Bystronic fibre laser cutting machine with a 3 m by 1.5 m sheet capacity, together with two press brakes from the same Swiss manufacturer, whose UK subsidiary is in Coventry. The three machines are installed in one unit, forming a lean production cell on the Sandwich site for processing mild steel and aluminium from 1 mm to 25 mm thick and stainless steel up to 15 mm.

Managing director Marco Carlotti comments: "Orders have flooded in recently across the board for batch sizes ranging from one-off to several thousand.

"They are being placed by existing and new customers, from powergen and pumps to street furniture and road sweepers to electronics, filtration and building. Our success is partly because we offer a complete subcontract solution including cutting, bending, machining, welding, assembly and painting.

"Several cutting methods are in use here, each of which has specific advantages that give our customers best value for money. Laser cutting is the lead technology, however, and we have been using CO₂-powered equipment for nearly 20 years.

"Due to the current higher level of business, we decided to replace one of our two second-generation 4 kW CO₂ machines with a Bystronic ByStar Fiber 3015 fitted with a 6 kW power source and a ByTrans Extended automated sheet loading and unloading system.

"The benefits have been astounding. On thinner sheets, say around 5 mm, the machine is four to five times faster, accuracy of cut is better and it is possible to produce



Marco Carlotti (right) with one of the ByStar Fiber laser cutting machine operators

finer detail than on a CO₂ machine. Fibre laser cutting is also not so expensive to run, as it consumes less electricity, does not need any laser assist gases and maintenance costs are lower."

At the end of 2016, he visited the EuroBLECH exhibition in Hannover, where it was obvious to him and the two machine operators accompanying him that fibre technology had moved forward so quickly that it had become the new standard in modern laser cutting. Both of his incumbent CO₂ laser cutting machine suppliers offered a fibre alternative with automation, but he decided in favour of Bystronic following a visit to see the machines being built in the Swiss factory, which he describes as impressive.

The ByTrans handling system provides the best of both worlds in that it stores up to six tonnes of material, enough for typically a couple of hours' lights-out production at the end of a day shift, yet it allows convenient manual intervention at a moment's notice to fulfil a rush job if necessary. A tower system would not have been so flexible, due to the difficulty of accessing the shuttle table to place a sheet by hand.

Another feature of the ByStar Fiber that Marco Carlotti likes is the control system, on which the interface is more akin to that of a tablet than a PC, making entering a program



A view of the ByStar Fiber at Stevens & Carlotti, Sandwich, showing the ByTrans Extended auto sheet load / unload equipment in the background

for an interim run easier. Conveniently, the same BySoft 7 software in the CNC system is also to be found in the controls of the latest Bystronic Xpert 150-tonne/3 m and 40-tonne/1 m capacity press brakes on site (the fabricator's fourth and fifth from this source over the last 10 years). The software synergy speeds throughput when a component needs to be both laser-cut and folded.

An extra piece of Bystronic software that is about to be harnessed at the Sandwich facility is Plant Manager, which will provide visual support to the machine operator when planning which materials to stock near the machine for the next jobs and when

unloading cut parts. All components belonging to a specific customer order can be colour-coded on the cutting plan so that they are distinguishable from parts associated with other orders. Moreover, the first and last cut part can be labelled so that the operator knows when an order begins and when it is completed.

Marco Carlotti concludes: "We have been impressed with the performance of the ByStar Fiber. The only problem we have is that it is so fast it can be difficult at times to feed the machine with the next sheet quickly enough.

"We are going through a major reorganisation of our site at present. As part of that, we will be rearranging the cantilever racking holding material for supply to the ByStar Fiber and will also be redesigning the breakout area to speed parts removal.



A 6 mm mild steel sheet being processed in the ByStar Fiber

"If business remains buoyant and carries on increasing the way it has over the last couple of years, we will be looking to add an extension to the factory unit and integrate a tower storage system with the ByTrans to expand the cell's automated production capability.

"Overall, the efficiency and accuracy of fibre laser cutting are allowing us to deliver competitively priced goods in a highly competitive industry, without having to compromise on quality or service. It is also helping to mitigate today's higher material costs, so we do not have to eat into our margins too much."



A view of the ByTrans Extended from the other end

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Dero takes off at the speed of light

Dero Fabrication is well-known amongst machinery suppliers to the food and pharmaceuticals sector and a new acquisition, promises even further growth. The name Dero Fabrication can be misleading because, when you visit the company's 10,000 sq ft facility in Worcester, there is much more than just fabrication going on. The company was founded in 1977 as a maintenance fabricator, but over the years has found that there was increasing pressure from customers to bring everything in-house.

"We were spending a lot with subcontractors to cut the sheet metal profiles, but we needed quicker turnaround times and that meant bringing everything in-house," says production manager James Taylor, whose father, John, owns the business.

The company now offers an end-to-end service for customers, from conception through to design, product development, prototype work and finally production. Most importantly, Dero provides all the services required without resorting to subcontracting, including laser cutting, assembly, welding, fabrication and finishing.

The introduction of laser cutting technology in 2004 was crucial: "That was a big step for us and enabled us to carve out a very strong position in the food and pharmaceuticals sector," explains James Taylor.

The move has paid dividends, particularly with the increased focus by the major food producers and supermarkets on checking and weighing systems.

"Food production is all about weighing, measuring, x-raying, filling and capping," says Chris Beese, sales manager at Dero. "The supermarkets in particular are very concerned about checking, because they need to protect their brand. They want protections in place to ensure that no metal enters the food chain and that pressure has gone down the supply chain to the food manufacturers. We've been able to provide a key part of the solution, namely the sheet metal work in the form of guards, chambers and basic shells for the metal detectors that sit on the food production lines."

The company now manufactures everything from gantries and stainless-steel frames, through to guards and chambers for food process equipment. In tandem, Dero

has also developed specialism in ultra-high standard finishes that are particularly valued by the pharmaceutical sector, including powder coating, galvanising, glass bead blasting, plating, anodising, chemical blacking and a number of bespoke finishes.

"For example, the pharmaceutical sector often wants a gloss finish, so we developed that capability," says Chris Beese. "In fact, we are now recruiting more people to make sure we don't have to subcontract at all. That's really the ethos of our business. We find it's better to have control, particularly with finishes as customers don't want sharp edges, particularly where there are lots of hands being used in the production process."

However, with growth has come pressure on production. "The 4kW CO₂ laser we had was struggling to keep up with our production demands." The answer was to acquire a Yamazaki Mazak OPTIPLEX Fiber 6kW laser. "It's so much quicker, says James Taylor. "We were running the old machine for 10 to 12 hour shifts, five days a week, but with the Mazak we are only scheduling eight hour shifts and getting through the same amount of work. In short, we've increased



Dero's new Mazak OPTIPLEX Fiber 6 kW in the company's 10,000 sq ft facility in Worcester

our capacity and our ability to cut much thicker sheet metal, but still only have one machine and one operator."

James Taylor continues: "What's more, with the old machine, our stainless-steel cutting topped out at 12 mm, but the Mazak is capable of 25-30 mm stainless. Prior to installing the new machine, we would have to send out 25 mm thick stainless steel for waterjet cutting, which is the most commonly used process for jobs using thick sheet, but it is also very expensive."

However, what is particularly unique about Dero's relationship with Mazak, is the company's position not only as a customer but also as a supplier. "We've been working for and with Mazak for many years now, to provide further support to their own factory which is located less than a mile away from our own," adds James Taylor. "I think there is something really special about the parts for one Mazak machine being made by another Mazak machine. It comes full circle and shows the quality and precision of the equipment."

The OPTIPLEX has also opened new markets for Dero. "We have one client who previously used waterjet. They would send components out to the waterjet company

and then get it back for machining and finishing. We are taking over all the processes and quoting a package, including framework and cabinets. We send them machine fabricated parts that they can just bolt together.

"Everyone has a laser, but not everyone has a laser that is as flexible as this. Being able to complete thicker work in-house gives potential customers the confidence that we've got control of everything, rather than having to subcontract. This is particularly important in pharma. As a capacity-selling tool it's second to none."

James Taylor has also been impressed by how quickly his operator has adjusted to the new machine: "Our laser operator was used to a different CNC, but he went over to Mazak for training and has picked it up very easily. It is a complex machine because of its capabilities, but it is clever at the same time. There are things you can do on the OPTIPLEX that you can't do with other machines."

"There is always a concern when you introduce new machinery, because the worst thing that could happen to us is have the laser go down. We even kept the old laser for a few months just to make sure, but

overall the transfer to the Mazak was easy. We got a lot of training, a lot of support and ultimately it was quite painless."

Dero's latest acquisition to support the OPTIPLEX is a nitrogen generation system. "The new system will ensure we always have a constant supply of nitrogen gas for the Mazak and will enable us to cut mild steel up to 6 mm thick with no oxidised edge. The latest investment will make us self-sufficient, increase capacity and improve quality.

James Taylor concludes: "We're probably the busiest we've ever been in the company's history, but it's no good making leaps and bounds, taking on more but ultimately letting people down. We take a view that we take on no more than we can handle but then work out how we can increase capacity further. The new OPTIPLEX is a perfect example of this philosophy."

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Prima Power 2D and 3D fibre laser machines

Today's sheet metal manufacturers require highly flexible, efficient and smart solutions. Prima Power latest innovations in fibre laser processing have been designed and developed to satisfy these expectations.

Platino Fiber Evo is the latest version of the Platino platform that has more than 2,000 installations worldwide, upgraded with important technological innovations.

Platino Fiber Evo is equipped with the new fibre cutting head with adaptive collimator designed and manufactured by Prima Power. It features adaptive optics for automatic management of the focus position and focus radius diameter. It ensures significant benefits for the customer in terms of machine reliability, increased performance for reduced piercing times and increased cutting speeds, especially on high thickness.

been developed to maximise the customers' competitiveness according to their application. In fact, the machine is provided with different packages of options dedicated to the various production needs: Smart Cut for fast processing of thin sheet metal up to 6 mm thick, with a drastic reduction in cycle times up to 30 percent; Max Cut for higher productivity on parts made of medium and high thickness sheets 6 to 25 mm with a 40 percent cycle times reduction and a surprising 90 percent reduction in piercing time; Night Cut for higher production reliability and better process monitoring.

As all models produced by Prima Power, Platino Fiber Evo has Industry 4.0 inside. Thanks to big data analysis, production process planning and real-time monitoring, it is possible to achieve the optimisation of complex processes and the intelligent management of the production cycle, with significant savings in terms of time and money. The latest innovation for 3D fibre cutting and welding is Laser

Next 2141. This is the new laser machine for stamped-metal-parts manufacturers in diversified industrial sectors, such as job shops, press shops, aerospace, agricultural, and automotive. The Laser Next 2141 provides them an unparalleled flexibility in terms of processes, part sizes, and configurations, combined with state-of-the-art performance, quality, and accuracy.

Laser Next 2141 is the latest evolution of the Laser Next family. All the winning features of the Laser Next 1530 and 2130 systems, highly specialised for the processing of components for the automotive industry, are made available in this new product, which is designed to be as universal and multipurpose as possible.

The working volume of this machine at 4,140 x 2,100 x 1,020 mm is the largest on the market with a very compact footprint and it is suitable to virtually all 3D stamped and flat sheet metal part sizes. Its technological features allow it to process



The machine is equipped with fibre laser sources with 2, 3, 4, and 6 kW power that provide the customer with high performance and at the same time great reliability.

Platino Fiber Evo cabins increase the machine accessibility, reduce its overall dimensions and are easy to install. The machine also features the latest generation "Open" control produced by Prima Electro, allowing easy and complete management of the work program and machine parameters.

In line with tradition, Platino Fiber Evo has

both three-dimensional and two-dimensional parts, and to easily switch from cutting to welding applications.

Laser Next 2141 is the perfect balance of speed, accuracy, and reliability. The linear motors on the main axes, the direct drive on the focusing head, and advanced control systems, provide the highest dynamics in its market segment, with single axis speed of 120 m/min and trajectory speed of 208 m/min. This is combined with maximum accuracy of Pa and Ps= 0.03 mm in a very large working envelope and with the best Overall Equipment Efficiency (OEE). Laser Next 2141 is equipped with either a 3 or 4 kW Prima Power fibre laser.

Laser Next 2141 is available in different configurations to better suit any production: standard version with Fixed Tables; Split Cabin for covered time operation; Turn-Table for large series production; Shuttle Tables for loading/unloading and setup operations outside the work envelope.

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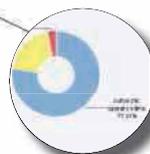


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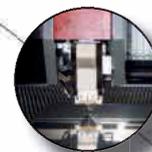
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TLM targets laser cutting growth with Universal Laser Systems partnership

TLM Laser has announced a further expansion of their laser technology portfolio to include the comprehensive Universal Laser Systems (ULS) range. This now enables the company to offer laser-cutting solutions for the broadest range of materials including organics, plastics and metals.

TLM Laser's philosophy is one of building a portfolio of world-class laser processing technologies that is available within the UK and Ireland from a single source. The recent addition of the ULS range of laser systems now means that the company can offer industry leading laser-cutting solutions for the widest range of materials and applications.

The Universal Laser Systems products provide TLM Laser with a range that includes desktop laser processing systems and stand-alone workstations using technology developed from a "Material Centric Approach". Universal Laser Systems focuses on the materials used by companies, together with its manufacturing processes, to develop highly efficient laser processing "Tools" that can be used on any laser compatible materials.



The ULS partnership means that TLM Laser is now able to offer an enhanced range of laser cutting systems.

Primarily based on CO₂ laser sources with a maximum laser power of 30 W to 150 W, this comprehensive range offers working envelopes between heights of 406 mm x 305 mm x 102 mm to 1016 mm x 610 mm x 305 mm. This broad choice of lasers, with wavelengths of 10.6µm or 9.3 µm, can cut and / or marking a vast range of materials.

Revolutionary technology using multiple laser wavelengths

One of the latest developments from Universal Laser Systems is the XLS10MWH MultiWave Hybrid™, the first and only



laser-system to combine multiple laser wavelengths and power levels into a single coaxial beam focused to a common focal plane. The XLS10 MultiWave Hybrid™ accommodates a fixed fiber laser source and two different CO₂ laser wavelength sources that can be independently or simultaneously controlled for a virtually infinite number of wavelength and power combinations. The ability to independently control each component of this hybrid laser beam allows optimum laser processing flexibility for an unlimited number of organic and inorganic materials. Moreover, the unique design of the optical system allows all wavelengths to focus into the same plane simultaneously. This makes it possible for the different wavelengths to work together to provide material processing capabilities that have previously not been possible. As a result, the MultiWave Hybrid can process any material, even notoriously difficult multi-layered materials with conductive and non-conductive layers.

Universal Laser Systems XLS10MWH MultiWave Hybrid is the first and only laser system to combine multiple laser wavelengths and power levels into a single coaxial beam focused to a common focal plane.

One example of an existing application using two wavelengths independently is stainless steel cutting. In this application, a 1.06 µm laser beam is used to heat the steel

locally, thereby increasing its optical absorptivity. Once the material is heated, the 1.06 µm laser beam is switched off, and a 10.6 µm laser, which is much less expensive to operate, is used to complete the material processing operation. This allows one laser wavelength to modify the properties of the material, so that the second laser wavelength can carry out the material processing operation, in this case cutting, much more efficiently.

Key features of the ULS range, which TLM's customers will benefit from, include a modular architecture. This unique "building block" architecture easily reconfigures field-upgradable platforms, laser sources and focusing optics, offering unsurpassed flexibility as material needs change and businesses evolve. This rapid re-configuration is easily achieved as the full range of factory-aligned laser sources are designed to be field-interchangeable, with no special tools or training needed.

Universal Laser Systems has also built up an extensive Materials Library, seen as the world's premier source for information on laser material processing. It provides information on the types of materials that can be laser processed and the processes, i.e. laser cutting, engraving and marking, that are possible with a given material. In addition, the Materials Library highlights considerations for an individual customer's laser system configuration that may be

necessary to process a given material, in addition to how ULS technology innovations can be leveraged to obtain the best possible results. This library is an evolving resource with updates made on a regular basis.

Complementing TLM's existing laser cutting offering

The addition of the ULS range complements LaserCube, which has been until now, the mainstay of TLM's laser cutting range. Designed specifically for metal cutting applications on smaller sheet sizes, this compact fibre laser cutting platform is also ideally suited to smaller production runs and thinner sections where it delivers superior cutting performance combined with low operating costs.

Manufactured by the world's leading developer and manufacturer of high-performance fibre lasers IPG, the LaserCube is the ideal cutting tool for metals, including mild steel, stainless steel, aluminium, copper, brass and exotic alloys. Ideally suited to smaller part sizes, prototypes and smaller production runs, the LaserCube provides the most cost-effective capacity addition and lowest cost of ownership of any professional laser cutter.



Commenting on this most recent partnership and the benefits it will bring to TLM Laser director Andy Toms says: "Having access to such a comprehensive range of field proven laser systems, supported with extensive processing knowledge, will allow us to offer tailored solutions to a much wider range of laser cutting applications. This will undoubtedly open up opportunities for TLM Laser in a number of new market segments and be a driver for growth within our business".

TLM Laser offers LaserCube for cutting applications on thin metals and small sheet sizes.

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Latest AMADA innovations take fibre laser quality to new levels

In order to push the quality of fibre laser cutting to new levels, AMADA is releasing two advanced technologies: Silky Cut Fibre and Gas Mixer. Available for the company's ENSIS and LCG (4 kW+) range of fibre laser cutting machines, these breakthrough innovations ensure superior quality in comparison with standard fibre lasers, allowing customers to enter new markets and win new orders.

While the industry's ongoing demand for fibre laser technology has been driven by high process speeds, it is well documented that quality dips below that of CO₂ lasers when working on thicker sheets with certain materials. With this in mind, AMADA's Silky Cut has been developed to offer CO₂ quality stainless steel processing up to 15 mm thick using fibre laser technology.

Unique to AMADA, Silky Cut is a combination of the company's own fibre laser source, new cutting head design and optimisation of the beam path optics, as well as advanced understanding of gas-flow dynamics and beam-shaping techniques. Customers can now process mid-to-thick stainless steel with the confidence that it will meet the highest standards. In addition, users processing thicker materials can now enjoy the reduction in energy consumption associated with fibre laser cutting, which is typically 70 percent less than an equivalent CO₂ laser. Sectors set to benefit include, oil and gas applications and food industry equipment.

Also unique to AMADA is Gas Mixer, which is designed for CO₂ quality processing of aluminium using a fibre laser technology.



Although near dross-free aluminium fibre laser profiling can be achieved using oxygen as the cutting gas, due to the inability to weld after oxygen cutting, this solution is rarely applicable. As a result, most opt for nitrogen when cutting aluminium, which is fast but exhibits quality that is less than satisfactory in some instances.

Using AMADA's Gas Mixer system, gases are mixed to a proven ratio that allows the perfect combination of improved cut quality and post-cutting weldability. Subsequently, users have the potential to eliminate secondary operations and reduce welding defects in comparison with oxygen-cut parts. Manufacturers working in the automotive, aerospace and general subcontract markets will be among those to benefit most.

Along with Silky Cut and Gas Mixer, customers choosing ENSIS machines will enjoy the additional advantage of original variable beam control technology. ENSIS technology allows high-speed processing of thin materials, high-quality processing of thick mild steel with negligible taper, and

high-speed piercing of thick mild steel. Moreover, the 3 kW ENSIS fibre laser can process the same 25mm thickness mild steel as a standard 6 kW fibre laser, with half the power. The upshot is lower cost-per-part, lower energy bills and greater profit margins. The ENSIS machine has proved particularly popular among sub-contractors, who demand flexibility with reduced process costs.

In summary, while many manufacturers are switching to fibre laser technology to increase profit through faster processing and reduced energy consumption on thin parts, quality can be compromised at the thicker end of the material spectrum. With this in mind, any fabrication or profiling shops faced with processing both thin and thick materials should opt for Silky Cut and Gas Mixer to enjoy benefits across the board. There will no longer be any need to retain a CO₂ laser cutting machine, or compromise on quality.

For more than 60 years AMADA has been at the forefront of the fabrication industry, providing machine tools that set the standard for performance and reliability.

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Phoenix brings control and cutting productivity

New LVD Phoenix fibre laser is transforming small UK family business

For brothers Darren and Ashley Churchill, going to work each day is more than just a job. Their company, JC Engineering, based in Reading, was started 51 years ago by their father John Churchill who is still very active within the business.

"We are still a traditional small family business," says Darren Churchill. "It is very rewarding when we get awarded with more orders from our customers. We have a good team of people here at JC Engineering who take great pride to ensure customer satisfaction."

Two years ago, the company acquired a local competitor, Just Precision Sheet Metal and it has recently invested in a new LVD Phoenix 3015 4 kW fibre laser machine. Along with the new laser, JC also invested in a complete refurbishment of its 10-year-old Easy-Form® press brake, bringing it up to the specification of a new machine with the latest CADMAN® TOUCH-B intuitive touch-screen control.

Darren Churchill explains that the decision to buy Just Precision was partly driven by the difficulty of finding skilled staff. He adds that the upgraded press brake also helps here as it allows a less skilled operator to be deployed on the machine: "We are now investing to bring the business up to a new level," he says.

JC Engineering became a customer of Shape Machines in the early 1980s and remained a customer when Shape became part of LVD in the 1990s. It bought its first CNC machine from LVD, a Delta 1000 turret punch, & LVD press brake, and both are in use every day.

In 2005 the company added a second CNC punch press, an LVD 1250 machine, and the Easy-Form press brake with CADMAN B software. So why did they wait until now to invest in a laser?

"We hadn't bought a laser before because we felt that the technology wasn't right for us," says Darren Churchill. "We were carrying out a lot of second and third operations on the punch, countersinking, forming, putting on part identification, and so on. This meant we could keep the parts on the punching machine for all these operations and keep our labour costs down."

He adds that the company undertakes a lot of work in aluminium, which again suited the punching technology:

"If stainless steel had been a big part of our business then we would probably have bought a laser 10 to 15 years ago, but until now we felt that the technology and running costs for cutting aluminium was not going to give us any benefit over what we had."

With the laser now up and running this is no longer a problem. Ashley Churchill says that has all changed with the advent of LVD's fibre lasers: "We spent a long time researching fibre technology and, in the end, there was only one choice, LVD."

"We are generally working with materials up to 6 mm thick, with the majority 3 mm or below. The fibre laser is cutting it at such a rate that I don't see how you could do it any other way more cost-effectively. We realised that now was the time to invest in a fibre laser, the technology was ready for the work we do."

"For us, quality is the priority rather than pure speed. The better the part that comes off the machine, the less time we have to spend ensuring the customer gets a good product."

JC's LVD Phoenix fibre laser can cut up to 12 mm thick aluminium,



15 mm stainless steel and 20 mm steel, as well as copper and brass, which the company couldn't previously offer. With both punching and laser cutting capability, the company can select the technology best suited for the job.

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Close relationship reaps dividends

Over the past 17 years, Leeds-based BJ Stainless Fabrications Ltd has been supplying premium quality bespoke designed metal fabrications to its ever-growing UK customer base. BJ Stainless added abrasive waterjet cutting to its production capability at the beginning of 2013, with a single headed machine, powered by a hydraulic intensifier pump.

With a move to a new facility in 2018 and increased demand in waterjet profiling over the past five years, the team at BJ Stainless made the decision to invest in the industry's latest available technology from Techni Waterjet.

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.

The machine that BJ Stainless specified was an Intec i713 which has a 4 m x 2 m cutting area, abrasive removal system, submerged cutting capabilities and also included the PAC60 5-axis cutting head, capable of creating up to 60-degree bevels. This was a particularly important feature for BJ Stainless, as this is an area it has targeted for significant growth in the future. Being able to waterjet cut countersunk holes was also a huge advantage, as this had previously been put through a secondary manufacturing process elsewhere in its production facility.

Liam Jackson, director at BJ Stainless Fabrications says: "I called AMC Jets and they introduced us to Techni Waterjet. We had a meeting on a site to demo a machine, a 2018 model with the brand-new Gen4 Pump and 5-axis cutting head. We were so impressed on how quiet the machine was when running at 60,000 psi and the sheer speed we can process material compared to before.

The week we had the install, AMC Jets were amazing. These guys pulled all the stops out. The training with one of the Techni team members made the machine so simple and easy to operate. There was not just the support from training, but if there was anything we needed to know they were just a call away."



Within days of the Techni Waterjet machine being installed, BJ Stainless had won a contract to manufacture bevelled edge stainless steel swimming pool grates. This was something they would have been unable to manufacture solely on their old 3-axis waterjet machine. On their old machine, it previously had to strip down the hydraulic pump every 50 hours, with 30 minutes to change the high-pressure seals. Because of the way the latest Gen4 Quantum ESP pump is designed, a minimum of 500 hours of cutting can now be achieved without any maintenance intervention. When you do need to change a seal, it takes less than 5 minutes. This results in higher machine productivity, increased 'up time' and therefore helps get orders shipped out to customers sooner. As the Quantum pump is also driven by an electric servo motor, this results in lower running costs, higher efficiencies and a virtually silent operation.

Stephen Stanway, of AMC Jets adds: "We

started to develop a close relationship with Liam and the team at BJ Stainless around 5 years ago when they first stepped into abrasive waterjet cutting. At AMC Jets, we have always prided ourselves on customer service, technical support and spares parts availability: what we believe to be the 3 key areas for any machines after sales support.

"After working with BJ Stainless in these areas on their older machine, it was a real credit to our efforts when we were handed the opportunity to become their approved waterjet partner for the foreseeable future with their new Techni Waterjet machine investment."

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High-strength tool steel for more efficient press hardening

Longer tool life and reduced cycle times in production

Press hardening has numerous advantages for the automotive industry, specifically in body part manufacturing. To benefit from the advantages of press hardening in the long term and to further reduce its cycle times, the crucial part of the tool, i.e. the mould insert, must be made of a high-strength tool steel that additionally allows for an increase of quenching speed. It is precisely for this application that Deutsche Edelstahlwerke (DEW), a company in the SCHMOLZ + BICKENBACH Group, developed Thermodur 2383 Supercool hot work tool steel.

Thermodur 2383 Supercool combines excellent mechanical properties and wear resistance with outstanding thermal conductivity. These properties make the material ideal for use in press hardening tools. Press hardening, also referred to as hot stamping, is an innovative hot forming process for production of high-strength body parts. Thus, a preferable ratio of strength to weight can be adjusted, which is equivalent to lightweight construction of car bodies using steel instead of more expensive light metal alloys. The sheet metal part is hot formed and heat treated in a single, combined process step. Steel sheets are heated to austenitising temperature and subsequently transferred into a press tool featuring active cooling. Thus, quenching and forming are performed simultaneously. In addition to good mechanical properties like strength, through hardenability and wear resistance, thermal conductivity of the tool steel used for this process is of crucial importance for the uniformity of quenching as well as the cycle time and thus the cost-effectiveness of press hardening.

Good thermal conductivity, tensile strength and through-hardening

Compared to conventional hot-work steels (1.2343, 1.2344, and 1.2367) in quenched and tempered condition, the Thermodur 2383 Supercool (45 HRC) special steel solution exhibits a significantly higher thermal conductivity of 44 W/(mK) at 100°C. A die insert made of this special steel is thus



Press hardening tool made of Thermodur 2383 Supercool

able to conduct heat from the heated sheet in a controlled manner within a very short time. In addition, it is more resilient at consistently high temperatures, which is expressed by the lack of significant loss of hardness. Combined with an excellent resistance to thermal shock, this may also contribute to endurance of tools made from Thermodur 2383 Supercool even in severely demanding environments.

Deutsche Edelstahlwerke is one of the world's leading manufacturers of special steel long products. Deutsche Edelstahlwerke can look back on over 160 years of experience in the production of high-grade steel products. The range of products is unique worldwide and includes tool steels, stainless, acid and heat-resistant steels, engineering and bearing steels, plus special materials. The product portfolio ranges from 0.7 mm drawn wire to forged products of up to 1,100 mm in diameter. Deutsche Edelstahlwerke customers receive the entire manufacturing chain from a single source: from production to prefabrication to heat and surface treatment.

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The heat treatment line at Deutsche Edelstahlwerke (DEW)

long products business. A global name in tool steel and stainless long steel, the Group is one of two largest companies in Europe for alloy and high-alloy engineering steel. With a headcount of more than 10,000 at its own production and distribution companies in 30 countries across five continents, the company supports and supplies customers wherever they operate and offer a comprehensive Production and Sales & Services portfolio, allowing customers to benefit from the company's technological expertise, consistent high quality worldwide and in-depth knowledge of local markets.

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Quick and systematic tool change

transfluid simplifies complex tube processing with an automatic tool change system

Bending of tubes with diameters of up to 127 mm is continually growing more demanding, while the subsequent costs are approximately zero.

"It isn't only about implementing technical efficiency in processes or machines anymore," says Stefanie Flaeper, managing director of transfluid. "Most of all, the increased demands to new products must be implemented here. No matter the time efficiency and precision, the solution should, of course, be controllable." The German specialists have developed their tube bending machine to bend DB 40120-CNC-VE for this. It permits bending radii of $1 \times D$ at very low wall thicknesses in such tubes.

In the scope of a current project, the setup of this special bending system has been implemented fully electrically. All movement axes are optimally synchronised by the special transfluid sequence control or can be programmed controlled against each other. Additionally, it is possible to easily optimise the process via this sequence control, which

effectively improves product-specific cycle times.

Another strong point is simple operation. All parameters can be taken from the CAD and the corresponding form spanners can be called automatically as required. The transfluid engineers have implemented reduction of the subsequent costs by an automatic spanner change system. The time frame for tool change is comparable to that of a radius change.

The new DB 40120-CNC-VE has two tool levels. It is able to change the spanners eight times, so that each tube can be bent even in highly complex geometries. This form of tool equipment is particularly efficient, reducing subsequent costs to a minimum.

"Because the diameters are relatively similar and radii are very narrow at $1 \times D$, only the course geometries really change in new products. This means that only new spanning elements need to be used," explains Stefanie Flaeper. To implement the narrow radii at a relatively low wall thickness, the new pipe bending



The new pipe bending machine DB 40120-CNC-VE by transfluid changes tools automatically

machine has an additional pusher device that can controlledly guide even the last bend at short remaining lengths.

Watch the video at www.youtube.com/watch?v=Br6ZqXje2DI

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In a class of its own

New HBE320-523GA automatic mitre-cutting band sawing machine from Behringer

Opening new fields of business, extending the performance spectrum or replacing an old machine: these are among the most frequent reasons given by users for investing in an up-to-date, more efficient mitre sawing machine. With the latest automatic machine from its HBE series, BEHRINGER has created the perfect way of combining the benefits of modern high-performance machines for one-off sawing tasks with the solid, tried and tested characteristics of a classical mitre saw.

"We deliberately integrated various features from our BEHRINGER high-end models into this machine, raising the HBE320-523GA into a class of its own and with confidence," says Behringer Ltd managing director, Simon Smith.

High cutting output, simple handling and precise angular cuts are among the key attributes of the new BEHRINGER HBE320-523GA mitre-cutting bandsaw.

With its extensive application spectrum, it reliably covers the wide-ranging requirements of the steel construction sector and the steel trade. Potential users also include medium-sized operations, in which the new automatic HBE is required to run unmanned for part of the time.

"Process reliability and speed play a decisive role here. The machine must be capable of sawing a wide range of different materials rapidly and accurately", explains Simon Smith.

With a cutting range in rectangular materials of 520 x 320 mm, with two-way mitre cuts of 45° right and up to 30° on the left, this machine is the perfect all-rounder for all kinds of sawing operations.

"For reasons of cost and flexibility, profiles are generally purchased in stock lengths of up to 12 metres and then sawn to size", adds Simon Smith. "The new mitre cutting bandsaw is easily able to cope with



both structural and solid steel together with stainless steel profiles."

In design terms, the new mitre saw has many features in common with the HBE Dynamic series, which has already proved a resounding success. The guidance system in its torsionally rigid gantry design and the bilateral band wheel bearings ensure quiet running and precise cuts. The band guiding components are made of vibration-damping grey cast iron, which has a highly positive impact on the quality of the cut surface but also makes for a longer blade life. Electrically powered chip brushes clean the saw blade providing optimum cleaning/swarf removal from the blade.

A major benefit of this new generation machine is the saw bow down feed that is electronically controlled via a servo ball screw drive. As a result, constant chip load and shorter non-productive times produce faster cut times and improved blade life

The inclined position of the band wheels helps prolong the life of bandsaw blades by reducing fatigue due to cyclical bending. A fully automatic height adjustment facility for the saw frame and lowering of the saw when in rapid traverse help cut non-productive time to a minimum.

The inclined position of the bandsaw blade allows components such as steel beams, angles and U profiles as well as

hollow rectangular profiles to be sawn at higher speed and with minimal burr.

The sawing unit is mounted for easy turning in generously dimensioned axial roller bearings and can be swivelled with a simple manual action. The closed material table simplifies material handling directly at the cutting point. The machine comes with a microspraying system as standard.

The machine can be supplemented as required with infeed and discharge roller conveyors, measuring devices and cross conveying systems, as well as NC angular adjustment. Behringer GmbH supplies these highly process-reliable customised transport solutions from its own in-house steel production facilities.

Behringer Ltd is based in Pitstone, near Leighton Buzzard. You are invited to visit the Behringer Ltd Service Centre to see the new HBE 320-523G series machines together with the company's extensive range of straight and mitre cutting machines.

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Success breeds success

Prosaw Ltd has been supplying the world's finest metal cutting machines to UK industry since 1963 and has once again recently exhibited at the biannual MACH exhibition held at the NEC.

The Kettering-based company has exhibited at MACH exhibitions for over 30 years, and the 2018 event proved to be one of the most successful shows in the company's history, with a significant increase in visitor numbers resulting in a proportional increase in lead generation and ultimately machine sales. MACH continues to be the most successful platform in the UK for Prosaw, in demonstrating the largest and finest range of metal processing equipment.

Prosaw exhibited nearly twenty machines at MACH this year, ranging from entry level manual bandsaws through to bundle cutting bandsaws, automatic circular saws and hydraulic metal forming equipment. In excess of 560 leads were generated during the five days of the exhibition, which has already resulted in more than twenty machine sales, with a value of over half a million pounds.

One of the stars of the show was the Yilmaz AIM4310 Aluminium Machining Centre, generating more than half a million pounds' worth of potential business, including two machines already sold as a direct result of the exhibition. A particular highlight was a MEGA CS machine cutting over five different types of material for customers during the five days of the event, ranging from aerospace grade stainless steel, through to hydraulic cylinder rod material. This machine was the only sawing machine at MACH



cutting such a variety of metals, confirming its position as the UK's leading carbide saw.

Prosaw's design and manufacturing division is also capable of providing special purpose sawing machines for special applications, as well as individually designed solutions to the problem of quickly and efficiently moving cut components on to the next stage following cutting. From basic input and output conveyors to fully automated handling systems, Prosaw is happy to give free help and advice to companies on how to improve their production flow.

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Gillen Machine Tools Ltd are pleased to announce that, as of 1st May 2018, we are the sole official agent for all Behringer products in Ireland and Northern Ireland



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High speed and outstanding quality

LaserHybrid combines the advantages of laser and MIG/MAG welding

Cost-effective, reliable, consistently precise and, above all, fast, all the requirements placed on automated welding processes in the automotive industry, shipbuilding and pipeline construction continue to rise. It must be possible to join thick sheets as well as thin sheets in series production with increasing speed and quality. This is where LaserHybrid welding, for example, can bring greater profitability. This welding process combines laser and gas metal arc welding in a single process, making optimal use of the synergies. Users primarily benefit from a highly stable welding process, less preliminary work and rework along with high speeds and quality.

Fronius is now also offering the LaserHybrid welding process together with the intelligent TPS/i power source to provide an additional increase in performance.

LaserHybrid welding is a combination of two different welding processes: laser welding and gas metal arc welding (GMAW). A special focusing lens is used to focus the laser beam. This creates a high energy density, which quickly melts the material. The result is very deep penetration as well as high speed and strength. Another advantage of this welding process is the low thermal load and thus low distortion. Gas metal arc welding involves melting the wire electrode under a gas shroud. The gas used emerges on the welding torch around the wire, keeping the welding location free from oxygen and thereby preventing oxidation. The advantages of gas metal arc welding include its outstanding gap-bridging ability, easy seam preparation and targeted manipulation of the heat input.

The LaserHybrid head forms the heart of the welding process

Fronius has taken the key characteristics, benefits and advantages of both welding processes and brought them together in a single system. During LaserHybrid welding, a laser beam initially heats the surface of the component, resulting in deep, narrow penetration. The arc then forms a wide weld pool to provide outstanding gap-bridging ability. At the same time, deep penetration can be achieved. At the heart of the welding system is a compact LaserHybrid head with



LaserHybrid welding is a combination of two different welding processes: laser welding and Gas Metal Arc Welding (GMAW)

an integrated MIG/MAG welding torch and built-in laser optics. Different welding heads are available for various applications, in the automotive industry, shipbuilding or pipeline construction, for example. A robot holder forms the link between the LaserHybrid head and an industrial robot. This gives the LaserHybrid head the flexibility it requires to access difficult-to-reach areas of the component. The welding

wire can be placed in any position with respect to the laser beam, thus enabling the joining process to be adapted precisely to the wide variety of seam preparations, outputs, wire types, wire grades and joining tasks.

Hybrid system: quick, cost-effective and powerful

The interplay between GMAW and laser welding results in an extremely stable welding process with a high degree of thermal efficiency. The LaserHybrid welding process from Fronius is ideal for joining thin-sheet metals in series production, as required in the automotive industry, for example. It is also a suitable solution for welding thick sheets, for which considerably fewer weld layers are required, such as in shipbuilding. With Fronius LaserHybrid, it is possible to carry out automated joining of different aluminium and steel items at speeds of up to 8 metres per minute, in superlative quality. Users primarily benefit from the extended range of welding options and minimum effort required when it comes to seam preparation. The results are also virtually faultless. Complex and time-consuming seam rework is only necessary in rare instances. What is more, users can also weld edges created by plasma cutting, guillotine-shear cutting or flame cutting. All this means that LaserHybrid welding plays a significant role in reducing production and operating costs.



At the heart of the welding system is a compact LaserHybrid head with an integrated MIG/MAG welding torch and built-in laser optics

LaserHybrid on TPS/i

Fronius power sources provide the necessary energy and computing power. To date, the LaserHybrid system has been available with the TPS (TransPuls Synergic). Fronius is now also offering the hybrid process in combination with the innovative TPS/i power source. The TPS/i is a welding system with a modular structure that consists of networked and perfectly harmonised components. It has a high-performance processor and a high-speed bus, meaning that greater amounts of data can be transferred even quicker and control loops are faster than ever before. This results in increased welding speeds, more precision and outstanding welding results. Further advantages of the TPS/i are the various dip transfer and pulsed arc processes, such as the Fronius-developed LSC (Low Spatter Control) and PMC (Pulse Multi Control), that can be used with the aid of function packages. These allow the welder to use the same system for different applications, saving time, money and effort. The TPS/i also offers a wide range of options for networking and data documentation so that welding processes can be evaluated and



The laser beam heats the surface of the component, resulting in deep, narrow penetration. The arc then forms a wide weld pool to provide outstanding gap-bridging ability

optimised where necessary. Now users will also be able to benefit from all of these advantages with LaserHybrid welding.

Patented Crossjet unit protects the LaserHybrid head from spatter

A coated optical protective glass is used to protect the laser optics from damage and keep the system ready for operation. The LaserHybrid head uses a closed Crossjet unit to ensure that the protective glass itself remains clean, undamaged and transparent for the laser. An air flow very effectively diverts any welding spatter into an

extraction channel at supersonic speed. The air flow itself is also extracted before it can reach the weld area and interfere with the work of the shielding gas. The processing cell remains free of contaminants and welding fumes. This reduces errors on the device and ensures a high level of availability.

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New 3-phase welders offer unbeatable combination of power, performance and mobility

ESAB Welding & Cutting Products has unveiled its Rebel™ EMP 255ic and Rebel™ EMP 320ic multi-process welder for MIG/MAG, DC MMA and TIG welding. Both units weigh 31.4 kg and use 400 V +/-10% 3-phase supply voltage.

Rebel EMP 320ic provides a rated output of 320 A/30 V at 40 percent duty cycle and maximum output of 350 A/34 V, making it more than capable of running both solid and flux cored wires in heavy industrial applications. Rebel EMP 255ic provides a rated output of 255 A/26.8 V at 40 percent duty cycle and maximum output of 300 Amps/34 V, ideal for industrial applications requiring 1.0 to 1.2 mm wires.

"These Rebels are the most industrial Rebels yet. Their strong output enables users to gain the productivity benefits of spray arc welding with a wide array of wires on mild steel, stainless steel and even aluminum," says Martin Freibergs, business product manager Industrial/Light Industrial Product Systems, ESAB. "With a four-wheel roll system and a top wire speed of

20.3 m/min combined with great torque, they can ensure accurate and consistent feeding of wires of all diameters."

In addition to its excellent MIG/MAG capabilities, these multi-process Rebels also handle full MMA performance with electrodes up to 5 mm diameter, as well as gas-cooled TIG applications with a dedicated gas valve for professional TIG welding using Lift TIG starts.

Martin Freibergs adds: "Traditional welders with similar outputs are typically single-process MIG machines. They often fall short when it comes to power and long welding cycles. Rebel EMP 320ic offers fabricators a machine with true industrial performance for shop work and the power, portability and multi-process flexibility contractors need for structural steel erection."

Rebel EMP 255ic and Rebel EMP 320ic maintain the benefits of other Rebel EMP welders, including the colour TFT-LCD display.

"The multi-lingual user interface provides



a graphical and intuitive way of selecting processes and setting parameters," says Martin Freibergs. Also part of Rebel DNA is ESAB's sMIG ("smart MIG") technology for quick and easy results when short circuit MIG welding. The sMIG function monitors the operator's technique and continuously adapts to provide a stable arc and superior, repeatable welds.

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